UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

JUL 11 2013

Mr. Cliff Rader
U.S. Environmental Protection Agency
Office of Federal Activities
NEPA Compliance Division, EIS Filing Section
Ariel Rios Building (South Oval Lobby), Mail Code 2251-A
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Mr. Cliff Rader:

This letter is to inform you that the National Oceanic and Atmospheric Administration (NOAA) is adopting the U.S. Army Corps of Engineers' Final Environmental Impact Statement (FEIS) for the San Clemente Dam Seismic Safety Project. NOAA served as a cooperating agency on this document. The availability of the FEIS was published in the *Federal Register* on January 18, 2008 and is entered in EPA's database as 20080017.

NOAA has determined that this FEIS adequately analyzes and discloses the environmental impacts associated with this project. Therefore, NOAA intends to adopt this FEIS for the purposes of its compliance with the National Environmental Policy Act and agency decision-making purposes.

Should you have any questions, please contact the Responsible Official noted below or NOAA's Office of Program Planning and Integration at 301-713-1632.

Responsible Official:

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Sincerely,

Patricia A. Montanio
NOAA NEPA Coordinator

Printed on Recycled Paper

FINAL Environmental Impact Report /
Environmental Impact Statement

San Clemente Dam Seismic Safety Project

volume 1, Chapter 1.0 - 3.0





January 2008



Prepared for

California Department of Water Resources
U.S. Army Corps of Engineers

US Army Corps of Engineers®

SCH 1 #997042007

Certification of the Final Environmental Impact Report/Environmental Impact Statement (FEIR/EIS) for San Clemente Dam Seismic Safety Project

The Final Environmental Impact Report/Environmental Impact Statement (Final EIR/EIS) for the San Clemente Seismic Safety Project prepared for the Department of Water Resources and United States Army Corps of Engineers by Entrix Environmental Consultants is now complete. As Chief of the San Joaquin District of the Department of Water Resources, the lead agency under CEQA, I have reviewed the Final EIR/EIS, including the responses to comments, on the Draft FEIR/EIS and other related documents.

In accordance with CEQA Guidelines Section 15090, I herby certify:

1. The Final EIR/EIS was completed in compliance with the California Environmental Quality Act (CEQA)

2. The Department of Water Resources has reviewed and considered the information contained in the Final EIR/EIS prior to approving it. In accordance with CEQA Guidelines Section 15094, a Notice of Determination will be filed after a decision to approve a project alternative is made.

3. The Final EIR/EIS reflects the Department of Water Resources' independent judgment and analysis.

Paula J. Landis
Chief San Joaquin District
Department of Water Resources

12-31-07
Date

INFORMATION COVER SHEET

San Clemente Dam Seismic Safety Project Draft Environmental Impact Report/Environmental Impact Statement

Lead Agencies: U.S. Army Corps of Engineers (NEPA Lead Agency); California Department of Water Resources (CEQA Lead Agency)

NEPA Cooperating Agencies: U.S. Department of Commerce, NOAA's National Marine Fisheries Service (NMFS); U.S. Department of Interior, Fish and Wildlife Service

CEQA Responsible and Trustee Agencies: California Department of Fish and Game (CDFG), California Public Utilities Commission, Monterey Peninsula Water Management District, Central Coast Regional Water Quality Control Board

Project Sponsor/Proponent: California American Water Company (CAW)

Project Title: San Clemente Dam Seismic Safety Project

Project Location: The project is located in an unincorporated area of Monterey County, California, at the confluence of the Carmel River (River Mile 18.5) and San Clemente Creek, approximately 15 miles southeast of the City of Carmel-by-the-Sea and 3.7 miles southeast of Carmel Valley Village.

Project Purpose, Need & Objectives: The need for the San Clemente Dam Seismic Safety Project is to increase dam safety to meet current design standards. The purposes and objectives for the project are to protect public safety by meeting current standards for withstanding a Maximum Credible Earthquake and Probable Maximum Flood at San Clemente Dam, provide fish passage at the dam, maintain a point of diversion to support existing water supply facilities, water rights and services, and minimize financial impacts to California-American Water ratepayers.

Abstract: This Final EIR/EIS analyzes the Proponent's Proposed Project (dam strengthening) and the following alternatives: Alternative 1 (dam notching with partial sediment removal), Alternative 2 (dam removal with total sediment removal), Alternative 3 (Carmel River reroute and dam removal with in-place sediment stabilization), and Alternative 4 (No Project). Chapter 2 contains summaries of each alternative, and Chapter 3 contains detailed descriptions. With the exception of No Project, all of the alternatives evaluated in this EIR/EIS meet the purpose, need and objectives.

Date of Implementation: Depending on the alternative selected, the San Clemente Dam Seismic Safety Project would be implemented within five to seven years after project approval, including environmental review, permitting, design, infrastructure improvements, and all aspects of construction or demolition.

INFORMATION COVER SHEET

List of possible permits, approvals, and licenses: See EIR/EIS Chapter 1.5 ("Overview of Permit Approval and Consultation Requirements, San Clemente Dam Seismic Safety Project").

Authors and principal contributors to the Final EIR/EIS: ENTRIX, Inc. is the principal author (See EIR/EIS Chapter 6.0 for individual contributors).

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Location of Background Information: You may access the Final EIR/EIS and find more information about the project and the responsible agencies on the Corps website at **http://www.spn.usace.army.mil/regulatory/currpn.html**, and on the DWR website at **http://www.sjd.water.ca.gov/environmentalservices/sanclemente/index.cfm** Copies of this Final EIR/EIS are also available for public review at the following locations:

California-American Water Co. Monterey Division 50 Ragsdale Drive, Suite 100 Monterey, CA 93942-0951	City of Monterey Library 625 Pacific Street Monterey, CA 93940
Monterey Peninsula Water Management District 5 Harris Court, Building G Monterey, CA 93940	City of Carmel-by-the-Sea, Harrison Library Ocean Avenue City of Carmel-by-the-Sea, CA 93921

FINAL

Environmental Impact Report
Environmental Impact Statement

for the

San Clemente Dam Seismic Safety Project

Prepared for

California Department of Water Resources

U.S. Army Corps of Engineers

Volume 1, Chapter 1.0 – 3.0

January 2008

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Bob Biacchi

California Coastal Conservancy

California Coastal Commission

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ABBREVIATIONS & ACRONYMS

°C	degrees Celsius
°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
AASHTO	American Association of State Highway and Transportation Officials
ADPA	Archaeological Data Preservation Act
ADT	Average Daily Traffic
AEP	Association of Environmental Professionals
AF	acre feet
AFY	acre-feet/year
AMBAG	Association of Monterey Bay Area Governments
amp	ampere
APE	Area of Potential Effect
AQMP	Air Quality Management Plan
ARB	Air Resources Board
ASR	aquifer storage and recovery
BA	Biological Assessment
BACT	Best Available Control Technology
BMPs	Best Management Practices
BO	Biological Opinion
BRM	bedrock mortar
CAA	Clean Air Act (Federal)
CAAA	Clean Air Act Amendments
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CAT	Caterpillar (bulldozer)
CAW	California American Water
CCAA	California Clean Air Act
CCRWQCB	Central Coast Regional Water Quality Control Board
CDFG	California Department of Fish and Game
CDHS	California Department of Health Services
CDMG	California Division of Mines and Geology
CDWR	California Department of Water Resources
CEQ	Council on Environmental Quality
CEQA	California Environment Quality Act

ABBREVIATIONS & ACRONYMS

CESA	California Endangered Species Act of 1984
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geologic Survey
CHL	California Historical Landmark
CMP	Construction Management Plan
CNDDB	California National Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO	carbon monoxide
CPUC	California Public Utilities Commission
CRDRP	Carmel River Dam and Reservoir Project
CRLF	California red-legged frog
CRHR	California Register of Historical Resources
CRP	Conservation Reserve Program
CRWC	Carmel River Watershed Conservancy
CSLC	California State Lands Commission
CVFP	Carmel Valley Filter Plant
CVMP	Carmel Valley Master Plan
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
CWP	Coastal Water Project
cy	cubic yards
CY	construction year
DA	Department of the Army
dB	decibel
dBA	decibels on the A-weighted scale
DEIR	Draft Environmental Impact Report
DHS	(California) Department of Health Services
DO	dissolved oxygen
DPM	Deputy Project Manager
DPR	(California) Department of Parks and Recreation
DPS	Distinct Population Segment
DSOD	Division of Safety of Dams

ABBREVIATIONS & ACRONYMS

DWR	(California) Department of Water Resources
EC	Environmental Coordinator
ECMP	EPNG Environmental Compliance Management Plan
ECS	Environmental Compliance Supervisor
EFZ	earthquake fault zone
EI	Environmental Inspector
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EJSA	Environmental Justice Study Area
EM	Environmental Manager
EMFAC	Emissions Factors
EO	Executive Order
FMP	Federal Maintenance Plan
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESALs	equivalent single axle loads
ESJA	environmental justice study area
ESU	Endangered Species Unit
ESUs	Evolutionarily Significant Units
FEMA	Federal Emergency Management Agency
FMP	Federal Maintenance Plan
fsp	feet per second
g/sec	gallons per second
gpm	gallons per minute
GCC	Global Climate Change
GCD	General Conformity Determination
GCR	General Conformity Rule
GHG	greenhouse gas
GIS	Geographical Information System
GPS	Global Positioning Software
H^2S	Hydrogen Sulfide
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HAP	hazardous air pollutant

ABBREVIATIONS & ACRONYMS

HCA	High Consequence Area
HCM	Highway Capacity Manual
HP	horsepower
HRI	Historic Resources Inventory
HUD	Housing and Urban Development
I/M	Inspection and maintenance (program)
IRWMP	Integrated Regional Water Management Plan
JPA	Joint Powers Authority
kV	kilovolt
kVa	kilovolt-ampere
kW	kilowatt
LEDPA	least environmentally damaging practicable alternative
L	limited
lb	pound
Ldn	day-night sound level
Leq(24)	24-hour equivalent sound level
LOS	level of service
LPD	Los Padres Dam
M	moderate
m/s	meters per second
m^2	Meter (squared)
m^3	cubic meters
MAOP	maximum allowable operating pressure
MBFZ	Monterey Bay Fault Zone
MBUAPCD	Monterey Bay Unified Air Pollution Control District
MCE	Maximum Credible Earthquake
MCWD	Marina Coast Water District
MCPBID	Monterey County Planning and Building Inspection Department
MEI	Mussetter Engineering, Inc.
mg/l	milligrams per liter
mgd	million gallons per day
MMCRP	Mitigation Monitoring Compliance Reporting Plan
MMP	Mitigation Monitoring Plan
MOA	Memorandum of Agreement

ABBREVIATIONS & ACRONYMS

MOU	Memorandum of Understanding
MP	milepost
mph	miles per hour
MPWMD	Monterey Peninsula Water Management District
MRWPCA	Monterey Regional Water Pollution Control Agency
MSL	Meters above sea level
MUC	Multiple Use Class
MWH	Montgomery, Watson and Harza
MVM	million vehicle miles
MY	migration year
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NCCAB	North Central Coast Air Basin
NDDB	Natural Diversity Data Base
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NHPA	National Historic Preservation Act
NLPD	New Los Padres Dam
NMCH	see ROG, ROC
NMFS	National Oceanic and Atmospheric Administration Fisheries
NO_2	nitrogen dioxide
NOP	Notice of Preparation
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NSR	New Source Review
NTUs	Nephelometric Turbidity Units
NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
O_3	ozone
O&M	operation and maintenance

ABBREVIATIONS & ACRONYMS

OCRB	Old Carmel River Dam Bridge
OCRD	Old Carmel River Dam
OD	outside diameter
OHP	(California) Office of Historic Preservation
OHV	off-highway vehicle
OHWM	Ordinary High Water Mark
OSHA	Occupational Safety and Health Administration
p	pressure (sound)
Pb	lead
p_o	referenced pressure
PCE	passenger car equivalent
PE	Project Engineer
PEA	Proponent's Environmental Assessment
PERP	Portable Equipment Registration Program
PFMC	Pacific Fisheries Management Council
PG&E	Pacific Gas and Electric
PHI	Points of Historical Interest
PM_{10}	particulate matter less than 10 microns
PMF	Probable Maximum Flood
ppm	parts per million
PRC	Public Resources Code
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
P/SM	Pajaro/Sunny Mesa Community Services District
RDEIR	Recirculated Draft Environmental Impact Report
PVC	Polyvinyl Chloride
RFFA	Reasonably Foreseeable Future Actions
RHI	Rearing Habitat Index
RM	River Mile
RMP	Resource Management Plan
RO	reverse osmosis
ROC	reactive organic compounds
ROD	Record of Decision
ROG	Reactive organic gases

ABBREVIATIONS & ACRONYMS

RSPA	Research and Special Programs Administration
RTU	remote terminal unit
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SBC	Southern Bell Communications
SCAQMD	Southern California Air Quality Management District
SCCC	South-Central California Coast
SCD	San Clemente Dam
SCEDC	Southern California Earthquake Data Center
scf	standard cubic foot
SCS	Soil Conservation Service
SEV	Severity of Effect
SHEMP	Seismic Hazards Evaluation and Mitigation Plan
SHHA	Sleepy Hollow Homeowners Association
SHPO	(California) State Historic Preservation Office
SHSRF	Sleepy Hollow Steelhead Rearing Facility
SHW	Sleepy Hollow Weir
SIP	State Implementation Plan
SO	sulfur oxide
SO^2	sulfur dioxide
SOMP	Sediment Operation and Management Plan for Fish Passage
SPL	sound pressure level
SPCC Plan	Spill Prevention Containment and Countermeasure Plan
SR	State Route
SSC	Suspended Sediment Concentrations
Sta	Station
SWRCB	State Water Resources Control Board
SWPPP	Stormwater Pollution Prevention Plan
TCP	traditional cultural properties
TES	threatened, endangered, and special-status
TI	Traffic Index
TCPs	traditional cultural properties
UECRM Plan	Upland Erosion Control, Revegetation, and Maintenance Plan
URBEMIS	Urban Emissions (software)

ABBREVIATIONS & ACRONYMS

USACE	United States Army Corps of Engineers
USC	United States Code
ug/L	Barium concentration
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
vpd	vehicles per day
vph	vehicles per hour
WCC	Woodward-Clyde Consultants
WY	water year
YOY	young-of-the-year

CHAPTER 1.0

INTRODUCTION

1.0 INTRODUCTION

1.1 AUTHORIZATION AND AGENCY ROLES

The California Department of Water Resources (DWR) and the U.S. Army Corps of Engineers (USACE) have prepared this Final Environmental Impact Report (EIR) and Environmental Impact Statement (EIS) under the California Environment Quality Act (CEQA) of 1970, and the National Environmental Policy Act (NEPA) of 1969.

The EIR/EIS addresses the San Clemente Dam Seismic Safety Project. The EIR/EIS is an informational document for both lead agency decision-makers and the public regarding the environmental effects of the proposed San Clemente Dam Seismic Safety Project. The DWR is the state lead agency responsible for certifying this EIR/EIS and filing a Notice of Determination (NOD) under CEQA, and the USACE is the federal lead agency responsible for issuing a Record of Decision (ROD) under NEPA. The National Marine Fisheries Service (NMFS) and the United States Fish and Wildlife Service (USFWS) are federal cooperating agencies.

1.2 PROJECT PROPONENT AND BACKGROUND

The California American Water Company (CAW) is an investor-owned public water purveyor that is regulated by the California Public Utilities Commission (CPUC). The Coastal Division of CAW provides public water service to the Monterey Peninsula, and owns and operates San Clemente Dam (SCD) and Reservoir. This thin arch concrete dam is located 18.5 miles upstream from the mouth of the Carmel River, below its confluence with San Clemente Creek. The reservoir was constructed as a water supply project and provides a physical diversion point on the Carmel River from which water flows to the Carmel Valley Filter Plant and is distributed to the Carmel Valley Village area and other down-gradient areas. Although the SCD initially impounded a reservoir of about 1,425 acre-feet at the spillway elevation of 525 feet, it has never served as a water storage or flood control project. More than 2.5 million cubic yards of sediment have accumulated behind the Dam since it was constructed in 1921.

The Dam includes a fish ladder that allows steelhead trout, a federally listed threatened species, to ascend 68 feet over the Dam to use the watershed above the Dam. The California red-legged frog, another federally listed threatened species and a California State species of special concern, also uses habitat at the reservoir and along the river and creek.

1.3 AGENCY DECISIONS TO BE MADE

The DWR Division of Safety of Dams (DSOD) commissioned engineering studies in the early 1990's to evaluate seismic safety of SCD. These studies concluded that the Dam could suffer structural damage leading to the potential loss of the reservoir during a Maximum Credible Earthquake (MCE). In addition, under the Probable Maximum Flood (PMF), water could overtop the Dam, possibly eroding the downstream abutment area

and posing the risk of dam failure. Based on these findings, DSOD has required that SCD be brought into compliance to withstand loading from a MCE on nearby faults and safely pass the PMF. The MCE at the Dam site was determined by DSOD to be a magnitude 7.0 event originating from the Tularcitos Fault, 1.25 miles away. The PMF at the Dam site was determined by DSOD to be about 81,000 cfs. CAW has filed a design application with DSOD to strengthen San Clemente Dam to bring it into compliance with DSOD requirements. DSOD has determined that the San Clemente Dam Seismic Safety Project may have a significant environmental impact and therefore requires the preparation of an EIR.

As part of the SCD Seismic Safety Project, CAW has applied to the USACE for authorization to deposit approximately 3,200 cubic yards of fill material into Waters of the U.S. to strengthen SCD. This application is being processed under Section 404 of the Clean Water Act (CWA). The USACE has determined that the SCD Seismic Safety Project may have a significant impact on the quality of the human environment and therefore requires preparation of an EIS.

1.4 PROJECT PURPOSE, NEED & OBJECTIVES

Under NEPA, an EIS requires a statement of purpose and need (40 CFR 1502.13). The need is the broad underlying necessity or requirement to which the NEPA lead agency is responding.

Consequently, the need determines the range of alternatives that must be studied and the alternatives considered under NEPA must meet the project need. The proposed action, or project, is not the need in itself, but is rather the lead agency's proposed response to the need for the project. Typically, the proposed action is only one of a number of alternatives that will meet the stated need.

The purpose(s) are typically the specific objectives of the proposed action, by which the need will be met. Project purposes do not define the need, but respond to it by drawing in related considerations that must be integrated into the overall project. Under NEPA and the USACE's implementing regulations, the terms "basic" and "overall" purposes are used to identify important features and/or results the project alternatives must meet.

Statements of purpose and need are intended to be comprehensive enough to adequately encompass the need, and specific enough to guide the development of alternatives.

The NEPA statement of purpose and need is similar to what CEQA calls "objectives." The CEQA Guidelines[1] Section 15124(b), states that the project description must include "a statement of objectives sought by the proposed project" and that the objectives are intended to help the lead agency develop a reasonable range of alternatives to evaluate in an EIR (in this way objectives are similar to the NEPA need).

[1] California Code of Regulations, Title 14, Chapter 3 (Sections 15000 through 15387); commonly referred to as CEQA Guidelines.

Objectives also aid decision-makers in preparing findings or statements of overriding considerations (if necessary). The Guidelines further state "the statement of objectives should include the underlying purpose of the project."

Alternatives considered in an EIS must meet the need to which the lead agency is responding. The evaluation of alternatives must consider and address the project's purposes. The environmental evaluation presented in an EIR/EIS as well as the findings made when approving a project alternative also must consider and address the overall project objectives, which include the underlying project purpose. However, while CEQA encourages decision-makers to select alternatives that meet project objectives, it does not require that the approved project meet all project objectives.

For this EIR/EIS, the NEPA and CEQA requirements of stating the underlying requirement to which the project responds (which NEPA terms the "need" and CEQA refers to as its "purpose" and includes among the project objectives) is met by the following statement of the project need:

The need for the SCD Seismic Safety Project is to increase dam safety to meet current standards for withstanding a MCE and passing the PMF at the Dam.

The purposes and objectives for the project under NEPA and CEQA are to:

- Protect public safety.
- Provide fish passage at the Dam.
- Maintain a CAW point of diversion on the Carmel River to support existing water supply facilities, water rights, and services.
- Minimize financial impacts to CAW rate payers.

CAW's Proponent's Proposed Project and the alternatives to it that are evaluated in this EIR/EIS meet the need of eliminating safety risks associated with the MCE and PMF at the Dam and address the objectives stated above.

1.5 FEDERAL, STATE, AND LOCAL REQUIREMENTS

In addition to DWR and USACE, several federal, state, regional, and local agencies and decision-making bodies have jurisdiction over affected resources or have other permitting or regulatory authority. These agencies and decision-makers will review and consider the information contained in this EIR/EIS, and will consider it in their decision processes. Table 1.5-1 lists the agencies expected to use this EIR/EIS as part of their decision-making processes.

Table 1.5-1: Overview of Permit Approval and Consultation Requirements for San Clemente Dam Seismic Safety Project

Jurisdiction	Permits, Approvals & Consultations
FEDERAL AGENCIES	
U.S. Army Corps of Engineers (USACE)	Section 404 Permit, Clean Water Act (CWA). The USACE must determine compliance with Section 404(b)(1) guidelines. The permit will authorize any release of accumulated sediment from the Dam, the construction of two cofferdams in the Carmel River at the downstream toe of the Dam, temporarily dewatering the reservoir and plunge pool, and improving the bridge across the Carmel River at the Old Carmel River Dam (OCRD). Acts as NEPA lead agency, issues a Record of Decision (ROD). The ROD is a written public record explaining the lead agency's decision on the proposed action.
U.S. Fish and Wildlife Service (USFWS)	Administers Endangered Species Act (ESA) for certain federally listed species (including California red-legged frog). Consults under Section 7 of the ESA with the lead federal agency (USACE). Determines whether a proposed action is likely to jeopardize the continued existence of, or destroy or adversely modify critical habitat of federally listed species. If appropriate, issues a Biological Opinion with an Incidental Take Statement for affected species.
National Marine Fisheries Service (NMFS)	Administers ESA for federally listed marine mammals and marine and anadromous fish (including steelhead). Consults under Section 7 of the ESA with the lead federal agency (USACE). Determines whether a proposed action is likely to jeopardize the continued existence of, or destroy or adversely modify critical habitat of federally listed species. Issues a Biological Opinion (BO) with an Incidental Take Statement for affected species.
Other federal permits/regulations: Clean Air Act (CAA) Conformity Statement, Executive Order (E.O). 11990 Wetland Protection, E.O. 11988 Flood Management, E.O. 12898 Environmental Justice, Magnuson-Stevens Act (essential fish habitat)	
STATE AGENCIES	
California Department of Water Resources, (DWR)	Acts as CEQA lead agency. Certifies the EIR was prepared pursuant to CEQA, adopts CEQA Findings and files a Notice of Determination (NOD) for the selected project.
California Department of Water Resources, Division of Safety of Dams (DSOD)	Approves an application to repair, alter, or remove a dam.
California Office of Historic Preservation (SHPO)	Section 106, National Historic Preservation Act (NHPA). The alteration of the structure of the Dam requires evaluation, since the facility is more than 50 years old. The project includes repairing, altering or removing the bridge that crosses the Carmel River at the Old Carmel River Dam (OCRD), which is also more than 50 years old.
California Department of Transportation (Caltrans)	Transportation Permit. Required for transport of oversized loads on state highways. (This permit is usually obtained by the construction contractor or subcontractors.)
California Public Utilities Commission (CPUC)	Regulates investor owned utilities to authorize investments and related rate changes.
California Department of Fish and Game (CDFG)	California Trustee Agency (CEQA Guidelines section 15386) with jurisdiction over natural resources affected by a project which are held in trust for the people of the State of California with regard to the fish and wildlife of the State, to designated rare or endangered native plants, and to game refuges, ecological reserves, and other areas administered by the department. Streambed Alteration Agreement (California Fish and Game Code Sections 1601 and 1603 permits). Issues agreement with conditions to protect resources whenever a bed or bank of stream, lake or reservoir is altered. Issues incidental take permits for State-listed species. (Note: Other CDFG code sections may apply, including operation of dams to maintain fish in healthy condition downstream of the Dam (5937) and prohibitions against release of substances deleterious to aquatic life (5650). These sections of the Fish and Game Code would subject the project to citation if there were a violation. CDFG also oversees the annual Memorandum of Agreement (MOA) negotiated among CAW, Monterey Peninsula Water Management District (MPWMD) and CDFG) that addresses releases to the river from Los Padres reservoir.
Regional Water Quality Control Board (RWQCB)	Certification or waiver of certification according to Section 401 of the Clean Water Act (CWA) for construction related disturbance of water quality. The project may require a National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity.

Table 1.5-1: Overview of Permit Approval and Consultation Requirements for San Clemente Dam Seismic Safety Project, continued

Jurisdiction	Permits, Approvals & Consultations
STATE AGENCIES	
State Water Resources Control Board (SWRCB)	Approves and establishes project plans for a new point of diversion.
REGIONAL AGENCIES	
Monterey Bay Unified Air Pollution Control District (MBUAPCD)	Administers Air Quality Management Plan (AQMP) for Monterey Bay Region, Federal Maintenance Plan (FMP), and General Conformity Rule (GCR). May require permits for stationary equipment used in construction including mobile batch plants, compressors and generators unless this equipment is registered by the state, in which case only an inspection fee is required. A special permit may be required if sandblasting is used for surface preparation of the downstream face of the existing dam. A General Conformity Determination under the Clean Air Act is included as Appendix H to this EIR/EIS.
LOCAL AGENCIES	
Monterey Peninsula Water Management District (MPWMD)	Responsible for allocating production limits for the Monterey Peninsula Water Resource System. Administers annual mitigation program for the Monterey Peninsula Water Management District (MPWMD) Water Allocation Program. Issues River Access and River Work Permits. Participates in the development of an annual MOA with CAW and the CDFG that addresses releases to the river from Los Padres Reservoir.
Monterey Peninsula Regional Park District	MPRPD is not a regulatory agency, but owns and is responsible for the management of 919 acres of Carmel River watershed in the Project Vicinity. Over the next ten years, the MPRPD will be preparing a park management plan for the property. Areas of concern for the MPRPD include public access, sediment disposal on park land, and riverfront access and river restoration. MPRPD staff and Board reviews and comments on mitigation measures regarding MPRPD-owned land.
County of Monterey Public Works Department	Grading and encroachment permits for access road widening and improvements. Reviews code compliance for preservation of oak and other protected trees.
County of Monterey Water Resources Agency	Reviews work in the Carmel River bed described in the Section 404 permit, and proposed access road improvements. If floodplain remapping is required, a Letter or Map Revision or Conditional Letter of Map Revision may be issued.

1.5.1 FEDERAL REQUIREMENTS

NEPA / CEQA

A joint EIR/EIS must contain all the required elements of both the NEPA (P.L. 91-190; 42 (United States Code) U.S.C. 4321-4347; (Code of Federal Regulations) CFR §1500 et seq.) and the CEQA (Public Resources Code (PRC) §21000 et seq.). The two processes have many similarities, but also a few important differences. The following discussion highlights those differences and explains how this document incorporates the requirements of both. In general, the approach has been to meet the requirements of the more stringent of the two laws wherever they differ.

Significance

One of the primary differences between NEPA and CEQA is the way significance is determined and discussed in environmental documents. Under NEPA, significance is used to determine the need to complete an EIS as opposed to some lesser level of documentation. NEPA requires that an EIS be prepared when the proposed federal action (project) as a whole has the potential "to significantly affect the quality of the human environment." The determination of significance is based on context and intensity of impacts. Under NEPA, once a decision to prepare an EIS is made, it is the

magnitude of the impact that is evaluated and no judgment of its significance is required. NEPA does not require that a determination of significant impacts be stated in environmental documents.

CEQA does require California agencies to identify each "significant effect on the environment" that a project may have on the environment, and ways to mitigate or avoid each significant effect. A significant effect on any environmental resource triggers the preparation of an EIR. Each and every significant effect on the environment must be disclosed in the EIR and mitigated or avoided if feasible. In addition, CEQA Guidelines list a number of mandatory findings of significance, which also require the preparation of an EIR. At the end of the CEQA process, the lead agency must determine whether the project as approved will have a significant effect on the environment. There are no requirements under NEPA that parallel these requirements of CEQA.

The proposed San Clemente Dam Seismic Safety Project has been determined to require an EIR under CEQA and an EIS under NEPA. This joint EIR/EIS has been prepared to meet CEQA requirements for disclosing and identifying feasible mitigation for every significant effect, and NEPA requirements to evaluate the magnitude of impacts based on context and intensity.

EIR/EIS Content and Process

Under NEPA, an EIS must describe the environmental impacts of the proposed action; any adverse environmental effects that cannot be avoided; alternatives to the proposed action; the relationship between local, short term uses of the human environment and maintenance and enhancement of long term productivity; and any irreversible and irretrievable commitments of resources that would be involved in the proposed action. This document meets those NEPA requirements.

Under CEQA, an EIR must describe all significant effects on the environment that may be caused by the proposed project; significant effects that cannot be avoided; any irreversible effects; proposed mitigation measures; project alternatives; and growth-inducting impacts. This document meets those CEQA requirements.

Requirements for alternatives analysis differ between CEQA and NEPA. CEQA discusses the proposed project in detail and requires only enough information about alternatives to allow a meaningful comparison. NEPA requires that a reasonable range of alternatives be analyzed and discussed in comparable detail. This joint document meets the NEPA standard.

Air Quality and Conformity Statement

For joint NEPA/CEQA documents, the air quality analysis and technical report must comply with the federal CAA, and must contain a regional air conformity statement and a project level conformity statement (see air quality permitting discussion below). Evaluation of project impacts on air quality is included in Section 4.7 of this EIR/EIS.

Cultural Resources

Joint documents and cultural resources reports must comply with Section 106 of the NHPA. Surveys and reports prepared pursuant to Section 106 must be sent to the SHPO for concurrence (see cultural resources permitting discussion below). Evaluation of project impacts on cultural resources is included in Section 4.10 of this EIR/EIS.

Waters of the U.S. and Wetlands

Section 404 of the CWA (33 USC 1344) authorizes the USACE to issue permits, after notice and opportunity for public hearing, for the discharge of dredge or fill material into the Waters of the United States and adjacent wetlands. The decision to issue a permit is based on an evaluation of the probable impacts, including cumulative impacts, of the project and its impacts on the quality of the human environment (also see discussion of floodplains and wetlands permitting below).

For actions subject to NEPA where the USACE is the lead agency, the analysis of alternatives required for NEPA environmental documents will, in most cases, provide the information for the evaluation of alternatives under the Section 404(b)(1), *Guidelines for Specification of Disposal Sites for Dredged or Fill Material.* The Section 404(b)(1) Guidelines, published by the Environmental Protection Agency (EPA) in conjunction with the USACE, contain substantive environmental criteria used in evaluating discharges of dredged or fill material. Under these guidelines, no discharge can be permitted if a practicable alternative with less adverse impact on the aquatic environment (unless the identified alternative poses other significant environmental consequences) is available. In completing the ROD under NEPA, the USACE will require a Section 404 permit compliance and select a project that conforms to Section 404(b)(1) Guidelines. This is commonly called the Least Environmentally Damaging Practicable Alternative (LEDPA), although the term actually does not occur in the Guidelines. An alternative is considered practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. However, the USACE's evaluation of a Section 404 permit application is a two part test involving (1) a determination of whether the project complies with the Section 404(b)(1) Guidelines, and (2) a public interest review. This public interest review is a balancing test in which the public and private benefits of a project are compared against its adverse impacts to the environment. It includes such considerations as conservation, economics, aesthetics, navigation, fish and wildlife values, water supply, water quality, energy needs, flood damage prevention, and cultural resources. The USACE also considers all comments received in the permit process, whether in response to a public notice or a public hearing. A permit cannot be issued or an application must be denied if the project fails to comply with the Guidelines or is found to be contrary to the public interest.

Floodplains / Wetlands

The San Clemente Dam Seismic Safety Project is within the 100-year floodplain of the Carmel River and San Clemente Creek. The USACE mandates that impacts to

floodplains and wetlands be assessed and alternatives for protection of these resources be evaluated in accordance with Compliance with Floodplain/Wetlands Environmental Review Requirements (10 CFR 1022.12) and Federal E.O 11988 and E.O. 11990. Evaluation of project impacts on floodplains and wetlands is included in Section 4.8 of this EIR/EIS and constitutes the floodplain/wetlands assessment. The USACE published a notice of floodplain/wetlands involvement for this project in the *Federal Register* as part of its Notice of Intent. The ROD will contain the statement of findings for floodplain/wetlands impacts.

USACE Regulation of Discharge of Sediments

The USACE has published Regulatory Guidance Letter No. 05-04, providing guidance on the discharge of sediments from or through a dam and the breaching of dams, for purposes of Section 404 of the CWA and Section 10 of the Rivers and Harbors Act of 1899. The letter addresses releases of sediments from or through dams that require USACE permits. The guidance is not intended to require a USACE permit for routine high water flow dam operations that allow sediment-laden waters to flow from or through a dam; however deviations from normal dam operations resulting in the discharge of bottom sediment may require a USACE permit.

Sluicing of sediments through a dam is considered hydraulic dredging and the discharge of dredged material from a point source (i.e., The Dam) and requires a USACE permit pursuant to Section 404 of the CWA. Discharges of sediment through a dam are exempt from regulation when released for dam maintenance (but not for any other purpose such as maintenance of the reservoir pool). To be exempt, discharges of sediments through a dam would have to be necessary for essential dam maintenance. The USACE states that it is rarely necessary to sluice substantial quantities of sediments through a dam in order to accomplish essential dam maintenance and the Subsection 404(f) exemption will rarely, if ever, be applicable to the discharge of large quantities of sediments through a dam. A Sediment Operations and Management Plan (SOMP) (Appendix J) has been developed for sluicing under the Proponent's Proposed Project or Alternative 1.

Discharge of sediments may also require a USACE Section 10 permit if they occur in "navigable waters of the United States". This policy includes breaching of dams when sediment has accumulated in the reservoir basin and is released downstream.

Discharges of sediments may also be potentially regulated as fill material. Final revisions to the CWA Section 404 Regulatory Program defines "fill material" as material placed in Waters of the U.S. where the material has the effect of either replacing any portion of a water of the U.S. with dry land or changing the bottom elevation of any portion of a water. Based on this "effect" determination, USACE permits are generally required for the discharge of sediments from dams when such activities would have the effect of raising the bottom elevation of the downstream waters to a discernible, substantial degree.

The release of sediments incidental to normal dam operations is considered a de minimis discharge. These discharges do not trigger the need for a USACE permit so long as they are consistent with sediment loads entering the reservoir from upstream.

Some activities are not considered regulated discharges and do not require USACE permits, including actions such as the operation of continuously sluicing structures that mimic the natural increase and decrease of sediment in a stream; breaching or removal of a dam that results in the movement of only de minimis amounts of material or that results solely from an act of nature; releases during times of high water or flood stages for purposes of passing flood waters through the Dam; and the lowering of lake or pond levels that results in the release of only de minimis amounts of sediment.

The USACE may permit a reservoir to be drawn down and dredged material to be discharged downstream to avoid potential catastrophic dam failure, subject to emergency permitting procedures found at 33 CFR 325.2(e)(l).

Sluicing through a dam of less than 25 cubic yards of material may be authorized under Nationwide Permit 18. Districts may also develop Regional General Permits for larger amounts of sediments to be released through a dam. Small releases of sediments may be authorized under Nationwide Permit 23 if an agency has an approved Categorical Exclusion.

When discharging sediment from or through a dam or breaching a dam, the USACE requires reasonable measures to reduce potential harm to downstream waters. Reasonable measures include prior dewatering by pumping or by releasing water from the upper control structures on a reservoir; mechanical dredging or excavation of sediments and appropriate disposal; timing releases to coincide with high water periods for better dilution; more frequent flushing to keep the discharges small; releasing a sediment amount that is dependent on the amount of water flow; and installing temporary barriers to prevent exposed sediments from being transported by runoff from subsequent storm events.

Endangered Species Act (ESA)

The Federal Endangered Species Act (cited as ESA throughout this document) of 1973(16 United States Code [USC] 1536) as amended in 1988, establishes a national program for the conservation of threatened and endangered species of fish, wildlife and plants, and the preservation of the habitat critical to the survival of listed species. The purpose of the ESA is to conserve the ecosystems upon which endangered and threatened species depend and to recover listed species. Under the law, species may be listed as either “endangered” or “threatened.” “Endangered” is defined as a species in danger of extinction throughout all or a significant portion of its range. “Threatened” is defined as a species likely to become endangered within the foreseeable future. All species of plants and animals, except pest insects, are eligible for listing. All federal agencies are required to protect listed species and protect their habitats. Federal

agencies must use their authority to conserve listed species and ensure that their actions do not jeopardize the continued existence of listed species.

The ESA defines procedures for listing species, designating critical habitat for listed species, and preparing recovery plans. It also specifies prohibited actions and exceptions. The USFWS has primary responsibility for enforcing ESA with respect to terrestrial and freshwater organisms, while NMFS is responsible for enforcing ESA when marine species, including anadromous fish, are concerned.

Section 7(a) of the ESA requires federal agencies to ensure that the actions they authorize, fund, and carry out do not jeopardize species listed as threatened or endangered or their critical habitats. Section 7 provides that a project applicant may request consultation between a federal permitting agency and the USFWS or NMFS Fisheries (collectively, the "Services") if the applicant has reason to believe that a listed species is likely to be affected by a proposed project. The federal agency prepares a Biological Assessment (BA), which is reviewed by the Services. The responsible Service issues a BO regarding how the proposed action will affect listed species or critical habitat. If the Service determines that a proposed action will jeopardize the continued existence of a listed species, the Service must issue a BO offering “reasonable and prudent alternatives” about how the proposed action could be modified to avoid jeopardy.

Two federally listed threatened species occur in the Carmel River watershed and are present on the project site: the South-Central California Coast Steelhead (*Oncorhynchus (=Salmo) mykiss)* Evolutionary Significant Unit (ESU), and the California red-legged frog (*Rana draytonii*). The California red-legged frog is also listed under the California Endangered Species Act (CESA) as a species of special concern. Steelhead use the Project Area for migration, reproduction and juvenile rearing, however adult life stages occur primarily in the ocean. California red-legged frogs use the Project Area for all life history stages including reproduction, juvenile rearing and feeding and movement by adults. California red-legged frogs require aquatic habitats for egg laying and the development of tadpoles to juvenile frogs. Juvenile and adult frogs are dependent upon both terrestrial and aquatic habitats. Steelhead and steelhead habitat is under the jurisdiction of NMFS and the CDFG. California red-legged frogs and their habitat are under the jurisdiction of the USFWS and the CDFG. Designated critical habitat for both species occurs within the Project Area. Under a Settlement Agreement negotiated with the USFWS, CAW agreed to monitor, rescue, and translocate California red-legged frogs found in drying sections of the river to minimize effects of water pumping until a Habitat Conservation Plan is developed.

Potential impacts to threatened or endangered plants, wildlife, and fish species are discussed in Sections 4.4 and 4.5 of this EIR/EIS.

Under a 2001 Conservation Agreement negotiated with NMFS, CAW agreed not to divert water at San Clemente Dam during low flow periods (defined as 5 consecutive

days of 20 cfs or less flow as measured at the Don Juan gage). CAW also agreed to restrict its production from its upper Carmel Valley wells during low flow periods.

Fish and Wildlife Conservation Act

The Fish and Wildlife Conservation Act of 1980 (16 USC 2901 et seq.) encourages federal agencies to conserve and promote conservation of non-game fish and wildlife species and their habitats. In addition, the Fish and Wildlife Coordination Act (16 USC 661 et seq.) requires federal agencies undertaking projects affecting water resources to consult with the USFWS and the state agency responsible for fish and wildlife resources. These agencies have been sent copies of the Draft EIR/EIS and their comments have been considered. These agencies will also receive copies of the Final EIR/EIS.

Mitigation designed to conserve fish and wildlife and their habitat is provided in the sections in Sections 4.4 and 4.5 of this EIR/EIS.

Essential Fish Habitat (Magnuson-Stevens Act)

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), as amended, requires Essential Fish Habitat (EFH) descriptions in federal fishery management plans and requires federal agencies to consult with NMFS on activities that may adversely affect EFH. The regulations implementing the EFH provisions of the Magnuson-Stevens Act (*Federal Register* 67, No. 12) require all fishery management councils to amend their fishery management plans to describe and identify EFH for each managed fishery. Amendment 14 to the Pacific Coast Salmon Plan (1997)[2] covers EFH for all fisheries under NMFS jurisdiction that would potentially be affected by the proposed action. EFH includes all streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the habitat historically accessible to salmon. Activities upstream of impassable barriers are subject to consultation provisions of the Magnuson-Stevens Act when they would affect EFH downstream of those barriers.[3]

Under Section 305(b)(4) of the Magnuson-Stevens Act, NMFS is required to provide EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. Whenever possible, NMFS uses existing interagency coordination processes to fulfill EFH consultations with federal agencies. Evaluation of project impacts on EFH is included in the Section 4.4 of this EIR/EIS.

[2] The Pacific Fishery Management Council (PFMC) manages Pacific Coast salmon fisheries. Amendment 14 contains Appendix A, which identifies EFH by species and rivers from Alaska to California. The Carmel River is listed and is considered to have historically provided habitat for coho salmon (Brown and Moyle 1991).

[3] The Act does not apply if actions do not affect downstream EFH; in any case SCD is not upstream of such a barrier.

Other Federal Regulations Affecting Biological Resources

Migratory Bird Treaty Act (16 USC §703-711; 50 CFR Subchapter B)

This Act includes provisions for protection of migratory birds, including basic prohibitions against any take not authorized by the Act. The Act is enforced by the USFWS.

Rivers and Harbors Act (§10; 33 USC §201 et seq.)

This Act protects waters of the United States and is administered by the USACE.

Clean Water Act of 1977 (33 USC §1251-1376; 30 CFR §330.5[a]26)

These sections provide for the protection of wetlands and are administered by the USACE.

Executive Order 11990 — Protection of Wetlands (May 24, 1977)

This order provides for the protection of wetlands and is enforced by the USACE.

Cultural Resources

Preserving cultural resources allows Americans to have an understanding and appreciation of their origins and history. A cultural resource is an object, structure, building, site or district that provides irreplaceable evidence of natural or human history of national, state or local significance. Cultural resources include National Landmarks, archeological sites, and properties listed (or eligible for listing) on the National Register of Historic Places. Regulations established for the management of cultural resources include:

- Antiquities Act of 1906 (16 U.S.C. 431-433).
- Historic Sites Act of 1935 (16 U.S.C. 461-467).
- Section 106 of the NHPA of 1966 (16 U.S.C. 470 et seq.), as amended.
- Archaeological Data Preservation Act (ADPA) of 1974 (16 U.S.C. 469 a-c).
- American Religious Freedom Act of 1978.
- EO 13007 Indian Sacred Sites.

The USACE has initiated the Section 106 consultation process for this project with the State Historic Preservation Officer SHPO for California, the ADPA, and the consulting and interested parties (see Section 4.10 for further detail).

1.5.2 STATE REQUIREMENTS

Annual MOA on Carmel River Flows (CDFG, MPWMD, CAW)

CDFG has a duty to protect fish and wildlife resources of the state of California. The MPWMD, pursuant to its rules and regulations, establishes a quarterly water supply strategy and budget for the Monterey Peninsula. CAW supplies water to the Monterey Peninsula and must comply with State Water Resources Control Board (SWRCB) Order 95-10, as amended. The CDFG, MPWMD, and CAW have a mutual objective of managing surface flow in the Carmel River, and to the extent feasible, maximizing flow from June through December each year. Consequently, CDFG, MPWMD, and CAW enter into an annual SCD MOA providing for flow releases based on actual and projected Carmel Valley rainfall, runoff, storage, and production needs, with the intent of enhancing fishery habitats in the lower Carmel River. Enhancement of fishery habitats is achieved by establishing a minimum storage pool at Los Padres Reservoir and establishing a rate and schedule for flows downstream of Los Padres and San Clemente dams. Flow rates vary depending on seasonal rainfall, and typically range between 3 and 8.5 cubic feet per second between May and December below the SCD. In 2004, minimum pool at Los Padres was set at elevation 980', or 91 acre feet of storage; the minimum pool at SCD was set at elevation 515', or 71 acre feet of storage. Releases were scheduled to maintain between 5 and 9 cfs in the lower Carmel River, depending upon the month. The Annual SCD MOA also incorporates certain provisions of Order 95-10, as amended, which limit CAW's diversions from SCD and limit CAW's operations of certain of its wells in the Carmel Valley Aquifer during the dry season.

Streambed Alteration Agreement (SAA, CDFG)

Sections 1600-1616 of the California Fish and Game Code require project proponents to submit to CDFG a Notification of Lake or Streambed Alteration for any project that may “substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.” Upon approval CDFG will issue a Streambed Alteration Agreement (SAA). As a state agency, CDFG requires that a CEQA document be completed prior to issuing an SAA. This EIR/EIS provides the required CEQA compliance for this project. In addition to completing the Notification of Lake or Streambed Alteration and verification of complete CEQA documentation, project applicants must submit a fee to CDFG in order to receive the SAA.

Several different SAAs will be necessary for this project because the work involves stream crossings at more than one location and construction activity over multiple years. When project activities are similar each year, one SAA can be developed to cover the project term. For the San Clemente Dam Seismic Safety Project, the types of project actions could vary substantially from the first year to the last, consequently, separate SAAs may be required for the various activities such as construction of a

bridge across Tularcitos Creek, reconstruction of the Old Carmel River Dam Bridge (OCRB), and dewatering the plunge pool.

All SAAs define the seasonal work windows and protection measures required by CDFG, and Lake or Stream Alteration Program staff typically makes site visits prior to releasing an SAA.

California Fish and Game Code

The CDFG enforces the California Fish and Game Code. The California Species Preservation Act of 1970 (Code sections 900-903) provides for the protection and enhancement of the birds, mammals, fish, amphibians, and reptiles of California and prohibits the taking or possessing of any bird egg or nest. Sections 3511 and 5050 prohibit the taking or possessing of birds and reptiles listed as "fully protected". The Native Plant Protection Act of 1977 (Code sections 1900 et seq.) lists state-designated rare and endangered plants and provides specific protection measures for identified populations. Sections 1930-1993 provide for the Significant Natural Areas program and database.

CESA, Code §2050-2098, 1984) includes provisions for the protection and management of species listed as endangered or threatened, or designated as candidates for such listing. The act requires consultation "to ensure that any action authorized by a state lead agency is not likely to jeopardize the continued existence of any endangered or threatened species or results in the destruction or adverse modification of habitat essential to the continued existence of the species" (§2090). Plants of California declared to be endangered, threatened, or rare are listed in 14 CCR §670.2. Animals of California declared to be endangered, threatened, or rare are listed in 14 CCR §670.5.

Air Quality Plans

As required by the California CAA and Amendments (Health and Safety Code (HSC) Section 40910 et seq.) and the Federal CAA and Amendments (42 U.S.C. Section 7401 et seq.) the MBUAPCD is responsible for air monitoring, permitting, enforcement, long-range air quality planning, regulatory development, education and public information activities related to air pollution. California Health and Safety Code Sections 39002, et seq. and 40000, et seq. both require local districts to be the primary enforcement mechanism for air pollution control. The MBUAPCD promulgates and administers rules and regulations for the implementation and enforcement of the attainment and maintenance of federal and state ambient air standards.

Relevant to this project, MBUAPCD administers state and federal management plans, oversees general conformity, and enforces the statewide Portable Equipment Registration Program (PERP). The San Clemente Dam Seismic Safety Project must comply with:

- The 2004 AQMP for the Monterey Bay Region, which addresses attainment of state ozone standard and is updated every three years.

- The 1997 FMP, which addresses non-attainment areas for state and federal ambient air quality standards, including attainment of the Particulate Matter ($PM_{10)}$ standard.

- The General Conformity Rule, which was adopted to comply with the CAA Section 176(c) which prohibits federal entities from taking actions (e.g., funding, licensing, permitting, or approving projects) in National Ambient Air Quality Standards (NAAQS) nonattainment or maintenance areas which do not conform to the State Implementation Plan (SIP) for the attainment and maintenance of NAAQS pursuant to Section 110(a) of the Clean Air Act.

- The 1997 Statewide PERP, which establishes a uniform program to regulate portable engines and portable engine-driven equipment units. Once registered in the Program, engines and equipment units can operate throughout the State of California without the need to get individual permits from local air districts. Districts are preempted from permitting, registering, or regulating portable engines and portable equipment units registered with the Air Resources Board (ARB). However, local air districts are responsible for enforcing the program.

The San Clemente Dam Seismic Safety Project may affect air quality, primarily during construction and sediment management operations. Potential air impacts are discussed in Section 4.3, Air Quality, in Chapter 4.0 of this EIR/EIS. For general conformity, the Project will need to show that it does not conflict with the AQMP or the FMP, and that all non-mobile source equipment used complies with PERP.

Regulation of Water Utilities

The CPUC is charged with the regulation of the rates and service of investor-owned utilities (including all investor-owned water utilities, such as CAW) in California. The CPUC has several divisions, including its water division. The CPUC adopts Rules of Practice and Procedure and issues General Orders regulating various aspects of rates, services, facilities, and the safety and financial practices of utilities. Water utilities are under a mandate to serve customers within their authorized service areas. The CPUC routinely examines the adequacy of a water utility's water production, treatment, storage, and distribution systems. All major projects, such as the San Clemente Dam Seismic Safety Project, must be approved by the CPUC.

Greenhouse Gas Emissions

The California Air Resources Board (CARB), the California EPA, and other governmental agencies with jurisdiction have not yet developed guidelines on how to prepare a CEQA impact assessment for a project's greenhouse gas (GHG) contribution to Global Climate Change (GCC). The State Legislature enacted and the Governor signed Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, which charged CARB to develop regulations on how the State would address GCC. AB 32 focuses on reducing GHG in California. AB 32 requires CARB, the state agency charged with regulating statewide air quality, to adopt rules and regulations that would achieve greenhouse gas emissions equivalent to statewide levels in 1990 by 2020. SB 97

(2007) requires the State of California Governor's Office of Planning and Research to prepare "guidelines for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions" required by CEQA by July 2009. These guidelines, in turn, will be certified and adopted by the Resources Agency by January 2010.

1.5.3 LOCAL REQUIREMENTS

Monterey Peninsula Water Management District (MPWMD)

The MPWMD allocates water resources for the Monterey Peninsula Water Resources System and monitors the environmental effects of water production in the Carmel River watershed. MPWMD also issues River Access and River Work Permits.

The MPWMD Water Allocation Program sets annual water allocations for water resources within MPWMD's jurisdiction, including allocations for CAW. All water distribution systems within MPWMD's jurisdiction, including the CAW system, require a permit from MPWMD. As specified in the MPWMD Rules and Regulations (Rule 20 (B)), a change in CAW's distribution system (such as alternatives that would relocate CAW's point of diversion) may require a permit from MPWMD.

The MPWMD has developed a Mitigation Plan for the MPWMD Water Allocation Program. The Mitigation Plan is renewed on an annual basis, and focuses on fisheries, riparian vegetation and wildlife, the Carmel River lagoon, special-status species, and aesthetics. Activities undertaken under the Plan include irrigation and erosion control, fishery enhancement, flow releases, water quality monitoring, municipal water demand reduction, and regulating activities in the river corridor.

Monterey County Policies and Regulations

Monterey County has adopted policies and regulations managing forest resources. Under the provisions of Title 16, Chapter 16.60, Monterey County Code, no oak, madrone, or redwood tree six inches or greater in diameter (at two feet above ground level) shall be removed in the Carmel Valley Master Plan (CVMP) area without a tree removal permit. Chapter 16.60 also provides that no landmark oak tree shall be removed in any area except as approved by the Director of Planning and Building Inspection. Landmark oak trees are defined as trees 24 inches or greater in diameter (at two feet above ground level), or trees that are visually significant, historically significant, or exemplary of their species. Replacement of oak trees removed by project actions at a 1: 1 ratio is required under Chapter 16.60.

Monterey County Land Use Plans

The Monterey Country Comprehensive Plan and Local Area Plans (such as the Cachagua area plan) set planning and development policy for areas throughout the County, including those areas in which the San Clemente Dam Seismic Safety Project will be developed. The Monterey County Planning Department may require permits for the following activities:

- Removal of more than 3 oaks or any other protected trees for development or improvement of road or other project features would require a County permit.

- Development of any slopes over 30 percent would require Use Permits from Planning and Building Inspection.

- An encroachment permit would be required from County Public Works Department to access existing roads with new access points or improvements in existing rights-of-way.

- Grading permits would be required for the concrete batch plant, installation of the crane, and development of new and existing access roads.

1.6 PROJECT HISTORY

In 1980, DSOD requested that CAW evaluate the ability of the Dam to safely pass the PMF and withstand the MCE. Woodward-Clyde Consultants (WCC) was retained by CAW and completed an initial report in 1982. Although this preliminary report concluded that the Dam had adequate strength to resist the loadings imposed by either of these events, DSOD requested additional analysis, which was conducted by WCC and submitted by CAW. In a letter dated May 9, 1986, DSOD concluded that the proposed MCE and the response spectra were satisfactory; however, DSOD requested a more detailed analysis.

During the 1980s, MPWMD pursued the construction of a new dam on the Carmel River and investigated the San Clemente Dam site (referred to as the "New San Clemente Project") as an alternative location for a 29,000 acre-foot reservoir. Because the new reservoir, if constructed, would have inundated the existing dam and reservoir, DSOD agreed to defer their request for a more detailed analysis of the existing SCD. However, in February 1989, MPWMD shifted its focus from the New San Clemente Project to a dam site downstream of Los Padres Dam (LPD), which was believed to be a less environmentally damaging, more practicable alternative. When that project failed to proceed, DSOD renewed its request to CAW for completing an updated engineering analysis of the existing dam's stability.

In 1990, CAW retained an engineer to perform the required seismic and flood stability evaluations to comply with DSOD's request. The *Seismic and Flood Stability Evaluation, San Clemente Dam* report (WCC 1992) confirmed that with full storage, the Dam may not be stable under the MCE and the downstream abutment area would be susceptible to excessive erosion under PMF conditions. The existing spillway has a discharge capacity of about 20,800 cubic feet per second (cfs) at the Dam crest elevation. The PMF is estimated to be approximately 81,000 cfs, which would overtop the Dam by approximately 14 feet. Based on these findings (circa 1992), the DSOD required that SCD be brought into compliance with current seismic safety standards, to withstand loading from a MCE on the Tularcitos Fault and safely pass the PMF (these two events are not expected to occur simultaneously). DSOD also restricted use of flashboards.

At that time, an initial set of alternatives for repair of SCD was developed. This set of alternatives included:

- Strengthen the Dam;
- Lower the Dam crest (notching);
- Breach the Dam/crest at 490 feet (dam removal);
- Strengthen the Dam and raise the crest 10 feet;
- Strengthen the Dam and raise the crest 20 feet; and
- Strengthen the Dam, raise the crest 20 feet, and dredge the reservoir.

A 1993 report concluded that the alternatives would result in significant environmental impacts. Subsequently, CAW further defined the project objectives and identified additional alternatives for further evaluation.

Additional dam stress analyses were performed (WCC 1993), evaluating various reservoir levels, failure modes, and dam overtopping scenarios. These preliminary conceptual design alternatives were based on a determination that the Dam would have to be notched to elevation 509 (16 feet below the existing spillway elevation) for seismic stability and to elevation 506 to safely pass the PMF. The report noted that the stresses were greatly reduced when the superstructure was removed. DSOD accepted the 1993 report and agreed upon the design alternatives and CAW proceeded with preliminary engineering feasibility studies.

The engineering analysis, entitled *Structural Improvement of San Clemente Dam, Preliminary Feasibility Study* (1995), presented eight alternatives for dam reinforcement. Six of these were evaluated from an engineering and environmental impact perspective:

- Notching
- Post-Tensioning Tendons
- Arch Beams
- Arch Beams with Buttress Supports
- Downstream Thickening
- Roller-Compacted Concrete (RCC) Dam

The "No Action" alternative and a dam armoring alternative were also evaluated, but were found to be ineffective and dismissed prior to the environmental evaluation. The report compared all of the alternatives and identified dam thickening as the project

alternative that best met project objectives at an acceptable level of environmental impact. In August 1995, DSOD accepted the *Preliminary Feasibility Study* and confirmed that further study of the concept of dam thickening under CEQA was warranted. A final report was submitted to DSOD in September 1996.

In early 1996, CAW contracted with Moffat & Nichol Engineers to determine the feasibility of dredging San Clemente reservoir and potential sites for disposal or end-use of the dredged material. In September 1996 Moffat & Nichol Engineers submitted its report entitled *San Clemente Reservoir Dredging Feasibility Study*.

WCC was retained to perform preliminary project design for evaluation in a CEQA EIR, addressing access, retrofit design and rendering, dam break analysis, construction materials report and concrete production plan. In January 1997, WCC submitted to DSOD a draft engineering report entitled *Design Memorandum: Structural Improvements San Clemente Dam*. That report summarized the criteria used in the preliminary design of the proposed downstream thickening project; design alternatives for construction access from Carmel Valley Road to the Carmel Valley Filter Plant; the result of engineering analysis performed to verify the appropriateness of the design; mechanical and design considerations; and construction issues and site conditions.

In March 1997, DSOD accepted the MCE design criteria and other information prepared under the preliminary design scope of work (with some additional questions regarding the need for dowels). A Draft EIR (DEIR) for the SCD Seismic Retrofit Project was prepared in December 1998 and circulated for public review through February 1999. The DEIR analyzed dam removal, notching, and mitigated retrofit with sediment management alternatives. Comments on the DEIR requested new and expanded information including additional analysis of existing and new dam notching and removal alternatives, access alternatives, additional traffic analysis, as well as analysis of sediment releases from SCD, flushing flows, and other potential changes associated with dam removal.

The substantial amount of new information led to the preparation of a Recirculated Draft EIR (RDEIR) prepared by Denise Duffy & Associates, which was issued in 2000. The RDEIR responded to NMFS' desire to both meet dam safety objectives and restore natural fish passage, bedload transport and channel and canyon slopes and associated habitat occupied by the reservoir. The alternatives section of the RDEIR contained more detailed sediment management options to prevent the adverse effects of uncontrolled sediment releases.

Comments received on the RDEIR requested that dam removal be evaluated in more depth as an alternative. NMFS and others commenting on the RDEIR requested further analysis on hydrology and sediment transport in the Carmel River. Other comments requested further consideration of the Dam removal alternative, sediment management alternatives, and alternative access routes.

As a result of these comments, significant additional studies, funded by CAW, were conducted in cooperation with NMFS, USFWS, CDFG, MPWMD, DWR, and others to evaluate a wide range of sediment disposal options, including sediment releases to the Carmel River under various flow scenarios and associated with a range of notching and dam removal alternatives. An interagency working group spent considerable time and effort to explore potentially feasible means of notching the Dam or removing it with less adverse effects.

Since the release of the December 1998 DEIR, the reservoir has nearly filled with sediment, leading to concerns about fisheries/aquatic and flood plain impacts associated with uncontrolled releases. In 2003 the DSOD required modifications to SCD to meet interim dam safety requirements, including an interim drawdown (see Section 3.6). An Interagency Group identified a technical approach that could provide for safe controlled flow releases with acceptable environmental effects. Consultation under the Federal ESA for the interim drawdown was conducted with USFWS and NMFS leading to issuance of BOs under Section 7 of the ESA by USFWS and NMFS.

1.7 SCOPING, IDENTIFICATION OF ISSUES, AND PUBLIC REVIEW

NEPA procedures require public scoping for an EIS. CEQA provides for a response to the Notice of Preparation (NOP) by State Responsible and Trustee Agencies, and acknowledges the necessity for scoping when an EIR/EIS is prepared jointly with a federal agency.

DWR initially determined the need to prepare an EIR under CEQA in 1997, based on a preliminary evaluation of potential significant impacts of project construction and operation. An NOP with a 30-day review period was issued by DWR on March 25, 1997, and distributed to interested parties and organizations. A revised NOP for the EIR/EIS (SCH #2005091148) was filed on September 28, 2005 with the State of California Governor's Office of Planning and Research State Clearinghouse and was distributed by certified mail to all federal permitting agencies and California Responsible Agencies and Trustee Agencies (see Appendix A).

The USACE has determined that the deposition of fill and other project impacts may have a significant impact on the quality of the human environment and requires preparation of an EIS under NEPA. A Notice of Intent (NOI) for the SCD Seismic Retrofit Project was published by the USACE in the Federal Register on September 30, 2004 (Appendix B). The close of the comment period was November 30, 2004.

Public and agency scoping meetings for the EIR/EIS were held in Monterey, California on November 4 and November 9, 2004 to solicit input on the issues, impacts and alternatives that should be evaluated in the EIR/EIS. A scoping announcement and comment form was sent to public and agency mailing lists of more than 1,000 persons. The mailings were sent to local Monterey area residents, including participants in prior CEQA-mandated processes. A press release was sent to local print and radio news media, as well as other outlets and a flyer was prepared and posted throughout the

Monterey area. A project information package was developed and made available at both the public and agency scoping meetings in November 2004. Earlier scoping meetings had been held in April 1997 as part of the CEQA process for the 1998 DEIR and 2000 RDEIR.

Scoping comments were received at the public and agency meetings, and on comment forms made available at the meetings and sent to the public and agency mailing lists. Comments also were received on a project comment website. Letters containing comments were also received. A total of 197 comment responses were received. In addition, 235 comments that had been received on the RDEIR published in 2000 were taken into consideration. These comments were summarized in a detailed Scoping Report published January 20, 2005, and were considered by the Lead and Cooperating Agencies in determining the scope of the EIR/EIS. The majority of comments were made in the following issue areas:

- Aesthetics
- Air quality and noise
- Fish and aquatic biology
- Hydrology
- Project and alternatives
- Public health and safety
- Ratepayer and economic impacts
- Sediment transport, removal and disposal
- Terrestrial biology
- Traffic, safety, and access
- Water quality
- Water resources
- Wetlands

The Draft EIR/EIS was circulated for public comment from April 21, 2006 through July 3, 2006. A Notice of Availability was published in the Federal Register on May 19, 2006 and a Notice of Completion for the EIR was issued through the California State Clearinghouse on April 21, 2006. A Public Hearing on the Draft EIR/EIS was held in Carmel Valley on May 23, 2006. More than 650 comments were received on the Draft EIR/EIS. Appendices C and D contain the written comments received and the transcript

of the Public Hearing. The Final EIR/EIS has been rewritten to incorporate responses to these comments whenever the comment could best be addressed by modifying the document itself. Additional information is provided in the Final EIR/EIS which clarifies and amplifies the information included in the Draft EIR/EIS. Responses to comments are provided in Appendix E. The responses to all comments are arranged by subject area. Appendix E also provides reference to the sections of this Final EIR/EIS that have been modified in response to comments.

1.8 TERMINOLOGY USED IN THE EIR/EIS

The EIR/EIS uses the following terminology consistent with CEQA Guidelines to denote the significance of potential environmental impacts.

- A "less than significant" impact or an impact that is "not significant" would cause no substantial adverse changes in the environment; no mitigation is needed.

- A "significant" impact could or would cause substantial physical changes in the environment. Mitigation is recommended to reduce the impact to a less-than-significant level.

- A "significant and unavoidable" impact is one that could or would cause a substantial adverse change in the environment that cannot be avoided if the project is implemented. Mitigation may be recommended, but would not reduce the impact to a less-than-significant level.

Impacts for each resource or issue are analyzed and evaluated based on the following factors:

- Extent — considers whether the impact would be local or regional in nature;

- Duration — considers whether the impact is short-term (typically construction-related) or long-term (typically described in terms of years);

- Seasonality/Timing — considers variation in impact based on timing of effects (e.g., for steelhead trout and California red-legged frog);

- Intensity — considers whether the impact would be negligible (imperceptible or not detectable); minor (slightly perceptible and generally localized); moderate (apparent and having the potential to become larger); or major (substantial, highly noticeable and possibly permanent);

- Type — considers whether the impact would be beneficial or adverse.

1.9 ORGANIZATION OF THE EIR/EIS

The EIR/EIS is organized into six chapters which conform to the required contents of an EIR established in CEQA (Article 9, Contents of Environmental Impact Reports) and the recommended format of an EIS under NEPA (40 CFR 1502.10). Chapter 2.0 provides a

summary of the Proponent's Proposed Project and alternatives, and their potential for significant impacts and recommended mitigation measures. Chapter 3.0 provides a description of each component of the Proponent's Proposed Project and each major alternative, including planning, construction, and operations.

Chapter 4.0 presents the environmental setting, consequences and recommended mitigation measures. It is organized topically, following the major categories of potential environmental impact associated with the Proponent's Proposed Project and alternatives. Each topical section describes the local and regional setting and the known environmental impacts of the project. This Draft EIR/EIS considers the full range of potential environmental impact issues. Each issue has been analyzed against established standards of significance where applicable. Mitigation measures are recommended for each significant impact.

Chapter 5.0 discusses unavoidable adverse impacts, irreversible or irretrievable commitments of environmental resources, growth inducement, and cumulative impacts. It also considers the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. Chapter 6.0 lists the persons who prepared the report, agencies and persons contacted, and a bibliography. A list of acronyms appears in the Table of Contents.

1.10 EIR/EIS PROCESS

The EIR/EIS is intended for use by the lead agencies and the cooperating, responsible, and trustee agencies that may have permit or review authority over the project. A Notice of Availability (NOA) of the Draft EIR/EIS was published in the *Federal Register* on May 19, 2006 and a Notice of Completion for the Draft EIR was issued through the California State Clearinghouse on April 21, 2006. The Draft EIR/EIS was circulated for public comment from April 21, 2006 through July 3, 2006. Comments received by the lead agencies on the Draft EIR/EIS were reviewed and responses to comments have been addressed in this Final EIR/EIS. A Notice of Availability of the Final EIR/EIS will be published in the *Federal Register*, and no federal decision will be made until 30 days after the date of publication.

Prior to approving a project, DWR must certify that the final EIR/EIS has been completed in compliance with CEQA, that it has reviewed and considered the information in the Final EIR/EIS, and that the Final EIR/EIS reflects its independent judgment and analysis.. Once DWR approves a project, it will file a Notice of Determination (NOD) with the State Clearinghouse. Under NEPA, the USACE will issue a ROD explaining its decision and why it has taken the chosen course of action. The ROD will be prepared by the USACE and cannot be signed until at least 30 days after publication of the Final EIR/EIS. The ROD for this EIS/EIR will be signed at the completion of federal permitting associated with the USACE decision (including ESA Section 7 consultation, NHPA Section 106, and CAA Section 404). The ROD is part of the public record and will be made available upon request from the USACE.

It is not the purpose of an EIR/EIS to recommend either approval or denial of a project. NEPA requires each federal agency to adopt procedures to ensure that its decisions consider environmental effects, and the ROD is to be used in the federal decision. Although the EIR/EIS does not control the lead agencies' ultimate decisions on the project, the Lead Agencies must consider information in the EIR/EIS during the approval process. Under NEPA, no alternative may be selected unless it has been adequately discussed and evaluated in an EIS (or an environmental assessment [EA]). Under CEQA, DWR must respond to each significant impact identified in the EIR. If significant, adverse environmental impacts are identified in the EIR, approval of the project under CEQA must be accompanied by written findings, determining the following, as appropriate:

- Changes or alterations have been required in, or incorporated into, such project that mitigate or avoid the significant environmental effects thereof as identified in the completed EIR.

- Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency.

- Specific economic, social or other considerations make infeasible the mitigation measures or project alternatives identified in the EIR.

If mitigation measures are to be made a condition of the approval of the project, a mitigation monitoring plan/program must be adopted before the project is approved. CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits of a proposed project against its unavoidable environmental risks when determining whether to approve a project. When an agency approves a project that will result in significant and unavoidable impacts, it must make a Statement of Overriding Considerations. The NOD filed for the project must include information on whether the agency certified the EIR and made the findings, if required, under CEQA and whether it adopted a mitigation monitoring plan/program and/or a Statement of Overriding Considerations.

CHAPTER 2.0

SUMMARY

2.0 SUMMARY

2.1 PROPONENT'S PROPOSED PROJECT AND MAJOR ALTERNATIVES

No "preferred alternative" has been designated by the lead agencies. The Proponent's Proposed Project is dam strengthening (under the National Environmental Protection Act [NEPA], this is termed the "proposed action"). The following alternatives are considered in this EIR/EIS:

- Alternative 1: Dam Notching with Partial Sediment Removal
- Alternative 2: Dam Removal with Total Sediment Removal
- Alternative 3: Carmel River Reroute and Dam Removal with in-place Sediment Stabilization
- Alternative 4: No Project

The Proponent's Proposed Project and its action alternatives (Alternatives 1, 2, and 3) include site access and sediment removal, fish passage, and water diversion. The Proponent's Proposed Project and Alternatives 1, 2, and 3 meet the requirement of increasing the safety of San Clemente Dam (SCD) to meet design criteria for withstanding a Maximum Credible Earthquake (MCE) and passing a Probable Maximum Flood (PMF). Alternative 4 does not meet dam safety requirements.

2.1.1 PROPONENT'S PROPOSED PROJECT: DAM STRENGTHENING

The Proponent's Proposed Project is to strengthen the existing SCD, which is owned and operated by the Coastal Division of the California American Water Company (CAW). The proposed improvements are intended to comply with California Department of Water Resources (DWR), Division of Safety of Dams (DSOD) requirements to address safety deficiencies and eliminate the risk of failure during a MCE or a PMF event.

The Project Area is within the upper reaches of the Carmel River in an unincorporated area of Monterey County. SCD sits at the confluence of the Carmel River and San Clemente Creek (River Mile [RM] 18.5), approximately 15 miles southeast of the city of Carmel-by-the-Sea and 3.7 miles southeast of the Carmel Valley Village. SCD impounds a reservoir and serves as a surface water diversion. Another impoundment, at Los Padres Dam (LPD), is approximately five miles upstream at RM 23.5 on the Carmel River.

The Proponent's Proposed Project would eliminate safety risks by thickening the downstream face of the Dam with concrete, strengthening the right abutment near the dam crest, modifying the spillway and dam crest to increase effective spillway width and armoring the abutments with gunite to prevent erosion. A concrete batch plant would be

installed onsite to manufacture the required concrete. A tower crane would be staged at the base of the Dam to move construction materials from the batch plant to the Dam face and fish ladder. The electrical system at the Dam would be improved. During construction, the Carmel River and San Clemente Creek would be diverted around the construction area, the plunge pool at the base of the Dam would be dewatered, and a fish rescue and relocation operation would be operated during construction years. The plunge pool downstream of the Dam would be completely drained prior to dam thickening to allow access for construction workers and machinery for thickening operations and new fish ladder construction. The existing fish ladder allows steelhead trout (listed under the federal Endangered Species Act [ESA] as threatened) to ascend 68 feet to the reservoir and watershed above the Dam. The Proponent's Proposed Project includes a new fish ladder that would comply with existing criteria for fish passage promulgated by the National Marine Fisheries Service (NMFS) and the California Department of Fish and Game (CDFG). A sluice gate would be installed to manage sediment releases, to maintain upstream passage to the fish ladder exit and to maintain water flow into the CAW diversion pipeline. Sediment management following the Sediment Operations and Management Plan (SOMP) would be required to maintain the existing surface water supply intake and to ensure fish passage through the accumulated sediment. In addition, a notch would be cut into the Old Carmel River Dam (OCRD), which is about 1800-feet downstream of SCD, in order to provide adequate fish passage.

A new access from Carmel Valley Road (the "Tularcitos Access Route") would be constructed to bypass the portion of San Clemente Drive which goes through the Sleepy Hollow community by crossing Tularcitos Creek and connecting Carmel Valley Road to San Clemente Drive near CAW's Carmel Valley Filter Plant (CVFP). In addition, the Old Carmel River Dam Bridge (OCRB) and the access road from the CVFP to the Dam would be improved. The existing access road along the east side of the Carmel River, between the OCRD and the base of San Clemente would be rebuilt. The bypassed portion of San Clemente Drive would be used for up to eight months the first year of construction until the Tularcitos Access Route is completed.

The dam thickening alternative would take an estimated four to five years to complete, including environmental review, permitting, design, and infrastructure improvements.

2.1.2 ALTERNATIVE 1: DAM NOTCHING

This alternative would eliminate safety risks by notching the Dam to the approximate elevation of 506 feet in the area of the existing spillway bays. The gates, piers and walkway at the top of the Dam would be removed. This alternative would reduce mass sufficiently to avoid catastrophic failure of the Dam during a MCE event. Notching to an elevation of 506 feet also would be sufficient to ensure dam safety during a PMF. A new facility to divert water would be constructed upstream of the Dam to replace the existing surface water diversion at SCD. The electrical system at the Dam would be upgraded to support a conveyor sediment transport system. During construction, the Carmel River

and San Clemente Creek would be diverted around the construction area, the plunge pool at the base of the Dam would be dewatered, and a fish rescue and relocation operation would be operated during construction years. The plunge pool downstream of the Dam would be completely drained prior to dam notching to allow access for construction workers and machinery for notching operations and new fish ladder construction.

Sediment in the reservoir would be removed down to the level of the notch. A new Carmel River channel and San Clemente Creek channel would be reconstructed in a geomorphically stable configuration in the excavated sediments in the reservoir's inundation zone. Approximately 1.5 million cubic yards (cy) (930 acre-feet [AF]) of accumulated sediment would be removed over two seasons by excavation with heavy equipment. Sediment would be transported from the reservoir via a conveyor belt system to a disposal area east of San Clemente Reservoir. A new facility to divert water would be constructed upstream of the Dam to replace the existing surface water diversion at San Clemente. The existing fish ladder would be removed and a new ladder would be designed and built to accommodate the lowered dam elevation and to comply with existing criteria for fish passage promulgated by NMFS and CDFG. A sluice gate would be installed to enable managed sediment releases to maintain upstream passage from the fish ladder exit to upstream channels. Sediment management following the SOMP would be required to ensure fish passage through the accumulated sediment. In addition a notch would be cut into OCRD, which is about 1800-feet downstream of SCD, in order to provide adequate fish passage.

A design for sediment transport and disposal would be implemented that avoids sediment transport by truck through any populated area. Existing access roads (including San Clemente Drive) with minor improvements would be used to reach the base of the Dam for construction activities at and below the Dam. The OCRB and the access road from the CVFP to the Dam would be improved and the existing access road along the east side of the Carmel River, between OCRD and the base of SCD, would be rebuilt. An existing 4WD road (the Jeep Trail) would be improved to connect Cachagua Road with the sediment disposal site and to the reservoir area above the Dam. This route would be used only to move construction equipment and materials necessary to construct the road, prepare the sediment disposal site, connect the sediment disposal site to the Dam by conveyor belt and maintain the conveyor belt. All sediment transport would occur via conveyor belt from the Dam to the disposal site. No sediment would be hauled by truck over any roads. The stream channels through the upstream sediment plain would be stabilized.

The dam notching alternative would take an estimated six years to complete, including environmental review, permitting, design, infrastructure improvements, sediment removal, dam notching and upstream channel reconstruction through the sediment plain.

2.1.3 ALTERNATIVE 2: DAM REMOVAL

This alternative would permanently eliminate safety concerns through the removal of the Dam. The Dam would be demolished and removed from the site. A new facility to divert water would be constructed upstream of the Dam to replace the existing surface water diversion at San Clemente. The electrical system at the Dam would be upgraded to support a conveyor sediment transport system.

During construction, the Carmel River and San Clemente Creek would be diverted around the construction area, the plunge pool at the base of the Dam would be dewatered, and a fish rescue and relocation operation would be operated during construction years. The plunge pool downstream of the Dam would be completely drained prior to dam removal to allow access for demolition.

Approximately 2.4 million cy (1,555 AF) of accumulated sediment would be removed over three seasons by excavation with heavy equipment. Sediment would be transported from the reservoir via a conveyor belt system to a disposal area east of San Clemente Reservoir. The historic Carmel River channel and San Clemente Creek exposed by sediment excavation in the reservoir's inundation zone would be reconstructed in their historical valleys.

A design for sediment transport and disposal would be implemented that avoids sediment transport by truck through any populated area. Existing access roads (including San Clemente Drive) with minor improvements would be used to reach the base of the Dam for construction activities at and below the Dam. The OCRB and the access road from the CVFP to the Dam would be improved and the existing access road along the east side of the Carmel River, between OCRD and the base of SCD, would be rebuilt. An existing 4WD road (the Jeep Trail) would be improved to connect Cachagua Road with the sediment disposal site, and to the reservoir area above the Dam. This route would be used only to move construction equipment and materials necessary to construct the road, prepare the sediment disposal site, and connect the sediment disposal site to the Dam by conveyor belt. All sediment transport would occur via conveyor belt from the Dam to the disposal site. No sediment would be hauled by truck over any roads.

The existing dam and fish ladder would be demolished and removed from the site. A notch would be cut into OCRD, which is about 1800-feet downstream of SCD, in order to provide adequate fish passage.

The dam removal alternative would take an estimated seven years to complete, including environmental review, permitting, design, infrastructure improvements, sediment removal, dam demolition, and creek channel reconstruction.

2.1.4 ALTERNATIVE 3: CARMEL RIVER REROUTE AND DAM REMOVAL

This alternative would permanently eliminate safety concerns through the removal of the Dam. The Dam and fish ladder would be demolished and rubble used on site to stabilize the sediment pile. A new facility to divert water would be constructed upstream of the Dam to replace the existing surface water diversion at San Clemente. The electrical system at the Dam would be improved.

Approximately 380,000 cy (235 AF) of accumulated sediment behind the Dam on the San Clemente Creek arm of the reservoir would be relocated to the Carmel River arm by excavation with heavy earthmoving equipment. A portion of the Carmel River would be permanently bypassed by excavating a 450-foot-long channel through the ridge that separates the Carmel River and San Clemente Creek, approximately 3000 feet upstream of the Dam. The bypassed portion of the Carmel River would be used as a sediment disposal site for the sediment accumulated in the Carmel River and excavated from the San Clemente Creek arm. The spoils from the bypass channel construction (235,000 cy or 145 AF) would be used for construction of a diversion dike at the upstream end of the bypassed reservoir arm. The sediments at the downstream end of the bypassed reservoir arm would be stabilized and protected from erosion.

During construction, the Carmel River and San Clemente Creek would be diverted around the construction area, the plunge pool at the base of the Dam would be dewatered, and a fish rescue and relocation operation would be operated during construction years. The plunge pool downstream of the Dam would be completely drained prior to dam removal to allow access for demolition.

The Carmel River would be reconstructed through the historic inundation zone in the San Clemente Creek arm from the exit of the bypass channel to the dam site. The San Clemente Creek channel would be reconstructed through its historic inundation zone from the exit of the diversion channel to the dam site. Impacts to the river channel through the historic inundation zone would be mitigated. The existing fish ladder would be demolished and removed from the site. A notch would be cut into OCRD, which is about 1,800 feet downstream of SCD, in order to provide adequate fish passage.

A design for sediment transport and disposal would be implemented that avoids sediment transport by truck through any populated area. Existing access roads (including San Clemente Drive) with minor improvements would be used to reach the base of the Dam for construction activities at and below the Dam. The OCRB and the access road from the CVFP to the Dam would be improved and the existing access road along the east side of the Carmel River, between OCRD and the base of SCD, would be rebuilt. An existing 4WD road (the Jeep Trail) would be improved to connect Cachagua Road with the reservoir.

This project is expected to take five years to complete, including environmental review, permitting, design, infrastructure improvements, sediment removal, bypass channel

excavation, diversion dike construction, dam demolition, and creek channel reconstruction.

2.1.5 ALTERNATIVE 4: NO PROJECT

Under this alternative, the Dam would be left in place with all its existing facilities. A new fish ladder would not be constructed, OCRD would not be notched, and the sediment would be left in place behind the Dam. The reservoir would continue to accumulate sediment at an average rate of about 16.5 AF per year. Minor sediment removal may occur to allow the Dam to maintain the existing surface water supply intake serving the upper Carmel Valley Village area. The existing drawdown ports in the Dam and the existing fish bypass facility would both likely remain operational until the reservoir fills with sediment.

2.2 ALTERNATIVES CONSIDERED AND ELIMINATED

A number of alternatives have been previously considered and eliminated for the San Clemente Dam Seismic Safety Project. These include:

- Alternative designs for dam strengthening
- A new San Clemente Reservoir
- Dam removal through incremental notching and localized sediment management
- Alternative access routes
- Alternative means to excavate, transport, and dispose of sediment accumulated behind SCD
- Alternative disposal sites
- Alternative means to replace the CAW water diversion point at San Clemente Reservoir

Alternatives considered and eliminated are detailed in Section 3.1.

2.3 COMPARISON OF ALTERNATIVES: IMPACTS AND MITIGATION MEASURES

Table 2.1 presents a summary and comparison of the San Clemente Dam Seismic Safety Project, including the Proponent's Proposed Project and its alternatives. The matrix shows the affected resource areas and impact issues, and summarizes impact significance and mitigation for each alternative. The following discussion highlights key comparative impacts among the project alternatives. It also discusses changes and additional information provided in this Final EIR/EIS in response to comments that clarify and amplify the information included in the Draft EIR/EIS. The changes and additions are described in a summary manner. Further details and reasons for the changes are discussed in the specific resource sections. Where an issue determination has been changed, it is discussed under the specific issue heading for that alternative.

If an environmental resource issue is specified as “short-term” or “long-term” in Table 2.1, the referenced issue is limited to the respective definitions of these terms presented below, and in Chapter 4.0 of this report:

- Short-term impacts typically occur within the construction period (concurrent with the number of construction seasons, and vary from one alternative to another) or as a result of construction.

- Long-term impacts persist beyond the construction period and typically involve operations. They may be intermittent but over a longer period.

- Some of the resource issues have impacts that are both short-term and long-term.

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
GEOLOGY & SOILS					
GS-1: Ground Shaking *Risk of dam failure due to seismic activity*	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	DOES NOT APPLY (dam removal eliminates risk of failure)	DOES NOT APPLY (dam removal eliminates risk of failure)	**Impact**: long-term, significant and unavoidable risk of dam failure under maximum credible earthquake
GS-2: Access Route Landslides/Slope Stability *Risk of slides due to oversteepening hillsides*	**Impact**: short-term, less than significant with mitigation **Mitigation**: geotechnical design of road improvements, BMPs; in addition to SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: geotechnical design of road improvements, BMPs; in addition to SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: geotechnical design of road improvements, BMPs; in addition to SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: geotechnical design of road improvements, BMPs; in addition to SWPPP (Appendix K)	DOES NOT APPLY
GS-3: Reservoir Landslides *Risk of slides due to oversteepening hillsides*	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
GS-4: Soil Erosion *Risk of erosion along access road improvements and in sediment disposal areas; sediment and rock discharge to streams*	**Impact**: long-term, less than significant with mitigation **Mitigation**: erosion control and water quality BMPs in the SWPPP (Appendix K) NOTE: use of sediment disposal areas would not apply to the Proponent's Proposed Project.	**Impact**: long-term, less than significant with mitigation **Mitigation**: erosion control and water quality BMPs in the SWPPP (Appendix K)	**Impact**: long-term, less than significant with mitigation **Mitigation**: erosion control and water quality BMPs in the SWPPP (Appendix K)	**Impact**: long-term, less than significant with mitigation **Mitigation**: erosion control and water quality BMPs in the SWPPP (Appendix K)	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
GS-5: Bypass Rock Removal by Blasting *Topography alteration and safety hazards associated with blasting*	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	**Impact**: short-term, less than significant with mitigation **Mitigation**: Blasting Safety Plan Preliminary blasting BMPs have been incorporated into the SWPPP (Appendix K).	DOES NOT APPLY
GS-6: Erosion at Left Dam Abutment *Risk of erosion due to dam overtopping, leading to dam failure*	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	**Impact**: long-term, significant, unavoidable
HYDROLOGY & WATER RESOURCES					
WR-1: Changes in Streamflow During Construction *Changes in streamflow downstream of the Dam during construction drawdown, dewatering the plunge pool, or when inflow exceeds the bypass capacity*	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WR-2a: Changes in Sediment Flow Passing SCD Immediately After Construction *Changes in the amount of sediment transported from the upper watershed (above SCD) to the lower Carmel River (below SCD) immediately after construction*	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, significant, unavoidable **Mitigation**: Stream restoration and revegetation would stabilize sediment in reservoir area and avoid long-term significant impacts. These actions would occur in 7250 feet of the Carmel River and 3000 feet of San Clemente Creek.	**Impact**: short-term, significant, unavoidable **Mitigation**: Stream restoration and revegetation would stabilize sediment in reservoir area and avoid long-term significant impacts. These actions would occur in 200 feet of the Carmel River, 3000 feet of San Clemente Creek, and a 450-foot bypass channel.	DOES NOT APPLY
WR-2b: Changes in Sediment Storage and Composition in the Lower River During Construction *Changes in the sediment composition in the Carmel River below SCD*	**Impact**: short-term, less than significant with mitigation **Mitigation**: Water Quality Protection Plan including diversion of turbid water to settling basin (Appendix K SWPPP)	**Impact**: short-term, less than significant with mitigation **Mitigation**: Water Quality Protection Plan including diversion of turbid water to settling basin (Appendix K SWPPP)	**Impact**: short-term, significant, unavoidable **Mitigation**: Stream restoration and revegetation would avoid long-term significant impacts. These actions would occur in 7250 feet of the Carmel River and 3000 feet of San Clemente Creek.	**Impact**: short-term, significant, unavoidable Mitigation: Stream restoration and revegetation would avoid long-term significant impacts. These actions would occur in 200 feet of the Carmel River, 3000 feet of San Clemente Creek, and a 450-foot bypass channel.	DOES NOT APPLY
WR-3a: Change in Sediment Deposition in the Reservoir *Changes in the amount of sediment deposited in the reservoir upstream of SCD*	**Impact**: long-term, less than significant with mitigation, potentially beneficial **Mitigation**: Implementation of the SOMP (Appendix J)	**Impact**: long-term, less than significant with mitigation, potentially beneficial **Mitigation**: Implementation of the SOMP (Appendix J)	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant, potentially beneficial

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WR-3b: Increased Sediment Deposition that Obstructs Fish Passage *During low-flow years, when all the flow is through the fish ladder, sediment would move close to the fish ladder, and possibly impair fish passage from the ladder to the remnant pool*	**Impact**: long-term, less than significant with mitigation **Mitigation**: decrease capacity of the ladder forcing more water over spillway; implement SOMP	**Impact**: long-term, less than significant with mitigation **Mitigation**: decrease capacity of the ladder forcing more water over spillway; implement SOMP	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant with mitigation **Mitigation**: design of reconstructed channel and bypass channel to allow for fish passage	**Impact**: long-term, significant, unavoidable
WR-4a: Increased Sediment Deposition in the Lower River *Increased sediment load passing SCD depositing in the Carmel River bed below SCD*	**Impact**: long-term, less than significant, potentially beneficial **Mitigation**: no mitigation required	**Impact**: long-term, less than significant, potentially beneficial **Mitigation**: no mitigation required	**Impact**: long-term, significant, unavoidable **Mitigation**: none available	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant, potentially beneficial
WR-4b: Increase in Frequency of High Suspended Sediment Concentrations *High flow will increase the sediment concentration in the river and sediment management activities, such as sluicing, would further increase the suspended sediment concentration downstream of the Dam*	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, significant, unavoidable **Mitigation**: none available	**Impact**: long-term, significant, unavoidable **Mitigation**: none available	**Impact**: long-term, less than significant

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WR-5: Changes in Channel Bed Geometry *Additional sediment passing the Dam to the lower river would aggrade or degrade the river channel or change the channel cross section*	**Impact**: long-term, less than significant potentially beneficial **Mitigation**: no mitigation required	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, significant, unavoidable **Mitigation**: none available	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant
WR-6: Changes to the 100-year Flood Elevation *The increased sediment loading would alter the bed of the Carmel River and influence the 100-year flood elevation*	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, significant, unavoidable **Mitigation**: monitor downstream sediment accumulation; increases >0.5 feet would trigger channel restoration	**Impact**: long term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant
WR-7: Impact to Location or Timing of Water Supply Diversions *Changes to the location or timing of water supply diversions*	DOES NOT APPLY	**Impact**: long-term, less than significant with mitigation **Mitigation**: diversion would be operated to maintain fish passage flows in January-May. Diversion affects 7200 feet of stream	**Impact**: long-term, less than significant with mitigation **Mitigation**: diversion would be operated to maintain fish passage flows in January-May. Diversion affects 7200 feet of stream	**Impact**: long-term, less than significant with mitigation **Mitigation**: diversion would be operated to maintain fish passage flows in January-May. Diversion affects 3200 feet of stream	DOES NOT APPLY
WR-8: Increase Risk of Dam Failure *Risk of dam failure due to seismic activity or flooding, leading to or increasing downstream flooding*	**Impact**: long-term, less than significant **Mitigation**: no mitigation required; dam thickening design eliminates risk of failure	**Impact**: long-term, less than significant **Mitigation**: no mitigation required; dam notching design eliminates risk of failure	DOES NOT APPLY dam removal eliminates risk of failure	DOES NOT APPLY dam removal eliminates risk of failure	**Impact**: long-term, significant and unavoidable risk of dam failure under MCE or PMF

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WATER QUALITY					
WQ-1: Road Construction and Improvement Activities *Sediment discharge to watercourses, increased turbidity*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K).	DOES NOT APPLY
WQ-2: Instream, Streambank and/or Stream Margin Construction Activities *Disturbance of streambeds, increased turbidity*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) Note: Less than 1 acre of streambed impacted	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K). Note: Approximately 7.7 acres of streambed impacted	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) Note: Approximately 8.9 acres of streambed impacted	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) Note: Approximately 8.6 acres of streambed impacted	DOES NOT APPLY
WQ-3: Accidental Leaks and Spills of Toxic Substances *Discharge of toxic substances*	Impact: short-term, less **than** significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) and SPCC (Appendix R)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) and SPCC (Appendix R)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) and SPCC (Appendix R)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP Appendix K) and SPCC (Appendix R)	DOES NOT APPLY
WQ-4: Stream Diversions, Sheetpile Cutoff Walls, and Cofferdams *Increased suspended sediment and turbidity*	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WQ-5: Stream Diversions Ponded Areas *Increased turbidity and temperature, decreased dissolved oxygen*	**Impact**: short-term, less than significant with mitigation **Mitigation**: pipeline design to minimize effects, monitoring, mixing to reduce high water temperatures	**Impact**: short-term, less than significant with mitigation **Mitigation**: pipeline design to minimize effects, monitoring, mixing to reduce high water temperatures	**Impact**: short-term, less than significant with mitigation **Mitigation**: pipeline design to minimize effects, monitoring, mixing to reduce high water temperatures	**Impact**: short-term, less than significant with mitigation **Mitigation**: pipeline design to minimize effects, monitoring, mixing to reduce high water temperatures	DOES NOT APPLY
WQ-6: Stream Diversions Return of Bypassed Flows *Localized scour, sedimentation and turbidity*	**Impact**: short-term, less than significant with mitigation **Mitigation**: energy dissipation structures	**Impact**: long-term, less than significant with mitigation **Mitigation**: energy dissipation structures	**Impact**: long-term, less than significant with mitigation **Mitigation**: energy dissipation structures	**Impact**: long-term, less than significant with mitigation **Mitigation**: energy dissipation structures	DOES NOT APPLY
WQ-7: Rewatering After Stream Diversions *Fine sediment and toxins in return flow*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	DOES NOT APPLY
WQ-8: Discharge from Settling Basins *Increased temperature and turbidity, decreased dissolved oxygen*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WQ-9: Reservoir Drawdown *Increased turbidity, decreased dissolved oxygen*	**Impact**: short-term, significant, unavoidable **Mitigation**: slow drawdown to minimize effects NOTE: reservoir partially drawn down	**Impact**: short-term, significant, unavoidable **Mitigation**: slow drawdown to minimize effects NOTE: reservoir completely dewatered impact greater than the Proponent's Proposed Project	**Impact**: short-term, significant, unavoidable **Mitigation**: slow drawdown to minimize effects NOTE: reservoir completely dewatered impact greater than the Proponent's Proposed Project	**Impact**: short-term, significant, unavoidable **Mitigation**: slow drawdown to minimize effects NOTE: reservoir completely dewatered impact greater than the Proponent's Proposed Project	**Impact**: long-term significant, unavoidable
WQ-10: Reservoir Sediment Excavation *Increased turbidity*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)) NOTE: minimal excavation specific quantities unknown	**Impact**: short-term, significant, unavoidable **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) NOTE: About 1.5 million cubic yards (cy) of sediment would be excavated	**Impact**: short-term, significant, unavoidable **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) NOTE: About 2.5 million cubic yards (cy) of sediment would be excavated	**Impact**: short-term, significant, unavoidable **Mitigation** erosion control and water quality monitoring methods in the SWPPP (Appendix K) NOTE: 380,000 cubic yards (cy) of sediment would be excavated	DOES NOT APPLY
WQ-11: SCD Fish Ladder *Increased turbidity, release of toxic substances*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP and SPCC Plan (Appendix K and R)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP and SPCC Plan (Appendix K and R)	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WQ-12: OCRD Notching *Increased turbidity, release of toxic substances*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	DOES NOT APPLY
WQ-13: Sluice Gates *Increased turbidity*	**Impact**: long-term, significant, unavoidable **Mitigation**: Implementation of the SOMP (Appendix J)	**Impact**: long-term, significant, unavoidable **Mitigation**: Implementation of the SOMP (Appendix J) NOTE: The elevated turbidity level would be greater for Alternative 1 than for the Proponent's Proposed Project, but could have a shorter period of duration	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
WQ-14: Dam-related Construction or Demolition *Increased turbidity, release of toxic substances and fine grained sediment*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP and SPCC Plan (Appendix K and R)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP and SPCC (Appendix K and R)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	DOES NOT APPLY
WQ-15: Operations/Post-project Conditions *Improved post-project water quality in reservoir and restored streams*	**Impact**: beneficial **Mitigation**: no mitigation required	**Impact**: beneficial **Mitigation**: no mitigation required	**Impact**: beneficial **Mitigation**: no mitigation required	**Impact**: beneficial **Mitigation**: no mitigation required	**Impact**: long-term, significant, unavoidable

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WQ-16: Sediment Disposal *Stormwater sediment discharge at sediment disposal site.*	DOES NOT APPLY	**Impact**: long-term, less than significant with mitigation **Mitigation**: monitoring sediment disposal site and erosion control as needed following storm events (SWPPP Appendix K)	**Impact**: long-term, less than significant with mitigation **Mitigation**: monitoring sediment disposal site and erosion control as needed following storm events (SWPPP Appendix K)	**Impact**: long-term, less than significant with mitigation **Mitigation**: monitoring sediment disposal site and erosion control as needed (SWPPP Appendix K)	DOES NOT APPLY
WQ-17: Construction of Diversion Channel and Diversion Dike *Increased turbidity*	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	DOES NOT APPLY
FISHERIES					
FI-1: Access Route Improvements *Short-term alteration of aquatic habitat*	**Impact**: short-term, less than significant with mitigation; long-term, less than significant with mitigation **Mitigation**: limits on tree removal; measures to prevent roadfill from entering streams; streamside revegetation; SWPPP (Appendix K) Botanical Resources Management Plan (Appendix U) NOTE: Tularcitos Access Route.	**Impact**: short-term, less than significant with mitigation **Mitigation**: limits on tree removal; measures to prevent roadfill from entering streams; streamside revegetation; SWPPP (Appendix K), Botanical Resources Management Plan (Appendix U) NOTE: Cachagua Access Route	**Impact**: short-term, less than significant with mitigation **Mitigation**: limits on tree removal; measures to prevent roadfill from entering streams; streamside revegetation; SWPPP (Appendix K) Botanical Resources Management Plan (Appendix U) NOTE: Cachagua Access Route	**Impact**: short-term, less than significant with mitigation **Mitigation**: limits on tree removal; measures to prevent roadfill from entering streams; streamside revegetation; SWPPP (Appendix K) Botanical Resources Management Plan (Appendix U) NOTE: Cachagua Access Route	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
FI-2: Dewatering River Channels for Construction Purposes *Short-term loss of aquatic habitat*	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue, erosion control and water quality protection plan SWPPP (Appendix K), stream channel restoration NOTE: dewatering would occur during 1 construction season	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue, erosion control and water quality protection plan SWPPP (Appendix K), stream channel restoration NOTE: dewatering would occur during 1 construction season	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue, erosion control and water quality protection plan SWPPP (Appendix K), stream channel restoration NOTE: dewatering would occur during 3 construction seasons	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue, erosion control and water quality protection plan SWPPP (Appendix K), stream channel restoration NOTE: dewatering would occur during 1 construction season	DOES NOT APPLY
FI-3: Operation of a Trap and Truck Facility at OCRD *Short term loss of access for adult steelhead to upstream reaches*	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
FI-4: Diversion of Carmel River and San Clemente Creek Around San Clemente Reservoir for Construction Purposes *Short-term loss of aquatic habitat*	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation, NOTE: impacts to rearing habitat upstream of the reservoir, in about 1,200 feet of the inflowing Carmel River, and in less than 100 feet of San Clemente Creek during one construction year	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation NOTE: impacts to rearing habitat upstream of the reservoir for about 5,200 feet in the Carmel River and for about 1,350 feet in San Clemente Creek during two construction years.	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation NOTE: impacts to rearing habitat upstream of the reservoir for about 5,200 feet in the Carmel River and for about 1,350 feet in San Clemente Creek during three construction years.	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation NOTE: impacts to rearing habitat upstream of the reservoir for about 3,300 feet in the Carmel River and about 1,350 feet for San Clemente Creek during two construction years.	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
FI-5: Reservoir Dewatering *Short-term loss of aquatic habitat*	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation, erosion control and water quality protection plan (SWPPP Appendix K) NOTE: drawdown would occur during 1 construction season	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation, erosion control and water quality protection plan (SWPPP Appendix K) NOTE: drawdown would occur during 2 construction seasons	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation, erosion control and water quality protection plan (SWPPP Appendix K) NOTE: drawdown would occur during 3 construction seasons	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation, erosion control and water quality protection plan (SWPPP Appendix K) NOTE: drawdown would occur during 2 construction seasons	**Impact**: long-term, significant, unavoidable
FI-6: Water Quality Effects on Fish *Short-term loss of aquatic habitat*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality protection plan (SWPPP Appendix K), divert flows around reservoir, drawdown timing, insulate or shade diversion pipes, aeration	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality protection plan (SWPPP Appendix K), divert flows around reservoir, drawdown timing, insulate or shade diversion pipes, aeration	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality protection plan (SWPPP Appendix K)), divert flows around reservoir, drawdown timing, insulate or shade diversion pipes, aeration	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality protection plan (SWPPP Appendix K)), divert flows around reservoir, drawdown timing, insulate or shade diversion pipes, aeration	DOES NOT APPLY
FI-7: Fish Ladder Closure *Short-term limiting fish movement past the Dam site*	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Benefit**: no mitigation required	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
FI-8: Upstream Fish Passage *Long-term impact to fish migrating to upstream spawning and rearing habitat*	**Impact**: long-term, beneficial with mitigation **Mitigation**: ongoing, inspection of the river channel upstream of the fish ladder exit would be performed to determine that adequate channel depths are being maintained and implementation of the SOMP to maintain the upstream river channel for fish passage	**Impact**: long-term, beneficial with mitigation **Mitigation**: ongoing, inspection of the river channel upstream of the fish ladder exit would be performed to determine that adequate channel depths are being maintained. and implementation of the SOMP to maintain the upstream river channel for fish passage	**Impact**: long-term, beneficial **Benefit**: dam removed, upstream passage occurs in free-flowing stream	**Impact**: long-term, beneficial **Benefit**: dam removed, upstream passage occurs in free-flowing stream	**Impact**: long-term, significant, unavoidable
FI-9a: Sediment Impacts to Downstream Channels from Sluicing, Dredging, or Sediment Transport Downstream *Long-term alteration of aquatic habitat*	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term significant, unavoidable; long-term beneficial **Mitigation**: channel restoration and revegetation (Appendix U), erosion control and water quality protection (SWPPP) Appendix K	**Impact**: short-term, less than significant; long-term beneficial **Mitigation**: no mitigation required	DOES NOT APPLY
FI-9b: Impacts to Fish from Excavation or Dredging of Sediment for Fish Passage *Potential juvenile fish entrainment and mortality*	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
FI-10: Relocate CAW Water Diversion Upstream *Long-term reduction of flow in reaches of Carmel River between the new diversion point and dam*	DOES NOT APPLY	**Impact**: long-term, less than significant with mitigation **Mitigation**: an Operations Plan would be developed in conjunction with NMFS, CDFG, SWRCB, and the MPWMD to establish flows for steelhead habitat in this reach of the river	**Impact**: long-term, less than significant with mitigation **Mitigation**: an Operations Plan would be developed in conjunction with NMFS, CDFG, SWRCB, and the MPWMD to establish flows for steelhead habitat in this reach of the river	**Impact**: long-term, less than significant with mitigation **Mitigation**: an Operations Plan would be developed in conjunction with NMFS, CDFG, SWRCB, and the MPWMD to establish flows for steelhead habitat in this reach of the river	DOES NOT APPLY
FI-11: Fish Screen Installation *Long-term elimination of entrainment or impingement at the diversion*	**Impact**: long-term, beneficial **Mitigation**: no mitigation required	**Impact**: long-term, beneficial **Mitigation**: no mitigation required	**Impact**: long-term, beneficial **Mitigation**: no mitigation required	**Impact**: long-term, beneficial **Mitigation**: no mitigation required	DOES NOT APPLY
FI-12: Downstream Fish Passage Over SCD *Long-term improvement to fish passage over the Dam*	**Impact**: long-term, beneficial **Mitigation**: improved fish ladder and spillway modifications improve fish passage conditions	**Impact**: long-term, beneficial **Mitigation**: lower dam and low flow channel in spillway improve fish passage conditions	DOES NOT APPLY	DOES NOT APPLY	**Impact**: long-term, significant unavoidable
FI-13: Stream Sediment Removal, Storage, and Associated Restoration *Long-term reduction of aquatic habitat, short-term alteration of aquatic habitat*	DOES NOT APPLY	**Impact**: short-term, significant, unavoidable; long-term, less than significant with mitigation **Mitigation**: stream channel restoration in historic alignment, riparian revegetation	**Impact**: short-term, significant, unavoidable; long-term, beneficial **Mitigation**: stream channel restoration in historic alignment, riparian revegetation	**Impact**: short-term, significant, unavoidable; long-term, beneficial **Mitigation**: new channel constructed through bypass and SCC, riparian revegetation	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
FI-14: Notching OCRD *Short-term loss of rearing habitat, Improvement of fish passage*	**Impact**: short-term, less than significant with mitigation; long-term, beneficial **Mitigation**: fish rescue, stream recontoured to match new alignment, access roads regraded, riparian revegetation	**Impact**: short-term, less than significant with mitigation; long-term, beneficial **Mitigation**: fish rescue, stream recontoured to match new alignment, access roads regraded, riparian revegetation	**Impact**: short-term, less than significant with mitigation; long-term, beneficial **Mitigation**: fish rescue, stream recontoured to match new alignment, access roads regraded, riparian revegetation	**Impact**: short-term, less than significant with mitigation; long-term, beneficial **Mitigation**: fish rescue, stream recontoured to match new alignment, access roads regraded, riparian revegetation	DOES NOT APPLY
FI-15: Sleepy Hollow Steelhead Rearing Facility *Loss or degradation of water supply*	**Impact**: long-term, less than significant with mitigation **Mitigation**: an alternative water supply would be made available to the SHSRF in the Carmel River	**Impact**: long-term, less than significant with mitigation **Mitigation**: an alternative water supply would be made available to the SHSRF in the Carmel River	**Impact**: long-term, less than significant with mitigation **Mitigation**: an alternative water supply would be made available to the SHSRF in the Carmel River	**Impact**: long-term, less than significant with mitigation **Mitigation**: an alternative water supply would be made available to the SHSRF in the Carmel River	**Impact**: long-term, significant, unavoidable
TERRESTRIAL BIOLOGY					
VE-1: Special-Status Plant Species *Effects on Virgate eriastrum or Lewis's clarkia populations*	**Impact**: short-term, less than significant with mitigation **Mitigation**: avoid populations of CNPS List 4 species	**Impact**: short-term, less than significant with mitigation **Mitigation**: avoid populations of CNPS List 4 species	**Impact**: short-term, less than significant with mitigation **Mitigation**: avoid populations of CNPS List 4 species	**Impact**: short-term, less than significant with mitigation **Mitigation**: avoid populations of CNPS List 4 species	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
VE-2: Loss of Protected Oak Woodland *Loss of oak woodlands*	**Impact**: long-term, less than significant with mitigation **Mitigation**: avoid stand of blue oak along "high road" access by fencing. Botanical Resources Management Plan (Appendix U) provides for 3:1 replacement, plantings, monitoring, conservation easements, irrigation, protection from browsing NOTE: Smallest acreage of oak woodland potentially impacted	**Impact**: long-term, less than significant with mitigation **Mitigation**: avoid stand of blue oak along "high road" access by fencing. Botanical Resources Management Plan (Appendix U) provides for 3:1 replacement, plantings, monitoring, conservation easements, irrigation, protection from browsing NOTE: 2nd largest area of oakwood lands that may be impacted	**Impact**: long-term, less than significant with mitigation **Mitigation**: avoid stand of blue oak along "high road" access by fencing. Botanical Resources Management Plan (Appendix U) provides for 3:1 replacement, plantings, monitoring, conservation easements, irrigation, protection from browsing NOTE: Largest area of oak woodland that may be impacted	**Impact**: long-term, less than significant with mitigation **Mitigation**: avoid stand of blue oak along "high road" access by fencing. Botanical Resources Management Plan (Appendix U) provides for 3:1 replacement, plantings, monitoring, conservation easements, irrigation, protection from browsing NOTE: 3rd largest area of oak woodland that may be impacted	DOES NOT APPLY
VE-3: Loss of other Native Vegetation *Loss of native vegetation*	**Impact**: long-term, less than significant with mitigation **Mitigation**: facility and access footprints minimize loss of native vegetation; fencing; diffuse outflows to minimize erosion; supplemental irrigation; Botanical Resources Management Plan (Appendix U)	**Impact**: long-term, less than significant with mitigation **Mitigation**: facility and access footprints minimize loss of native vegetation; fencing; diffuse outflows to minimize erosion; supplemental irrigation; Botanical Resources Management Plan (Appendix U)	**Impact**: long-term, less than significant with mitigation **Mitigation**: facility and access footprints minimize loss of native vegetation; fencing; diffuse outflows to minimize erosion; supplemental irrigation; Botanical Resources Management Plan Appendix U)	**Impact**: long-term, less than significant with mitigation **Mitigation**: facility and access footprints minimize loss of native vegetation; fencing; diffuse outflows to minimize erosion; supplemental irrigation; Botanical Resources Management Plan (Appendix U)	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
VE-4: Indirect Effects on Native Vegetation *Effects caused by increased erosion and sedimentation*	**Impact**: short-term, less than significant with mitigation **Mitigation**: BMPs for erosion control; minimize changes to existing drainage patterns; avoid work within tree dripline; dust control; revegetation; monitoring see Botanical Resources Management Plan (Appendix U) and SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: BMPs for erosion control; minimize changes to existing drainage patterns; avoid work within tree dripline; dust control; revegetation; monitoring see Botanical Resources Management Plan (Appendix U) and SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: BMPs for erosion control; minimize changes to existing drainage patterns; avoid work within tree dripline; dust control; revegetation; monitoring see Botanical Resources Management Plan (Appendix U) and SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: BMPs for erosion control; minimize changes to existing drainage patterns; avoid work within tree dripline; dust control; revegetation; monitoring see Botanical Resources Management Plan (Appendix U) and SWPPP Appendix K)	DOES NOT APPLY
WI-1: Dam Strengthening *Disruption of bat nesting areas*	**Impact**: short-term, less than significant with mitigation **Mitigation**: preconstruction survey followed by consultation	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
WI-2: Removal of Ancillary Facilities *Displacement of special-status bats*	DOES NOT APPLY	**Impact**: short-term, less than significant with mitigation **Mitigation**: preconstruction survey followed by consultation	**Impact**: short-term, less than significant with mitigation **Mitigation**: preconstruction survey followed by consultation	**Impact**: short-term, less than significant with mitigation **Mitigation**: preconstruction survey followed by consultation	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WI-3: Cofferdam Construction and Plunge Pool Dewatering *Adverse effects to special-status species*	**Impact**: short-term, significant, unavoidable; long-term, beneficial with mitigation **Mitigation**: preconstruction survey; rescue and relocate CRLF and Western pond turtles; monitoring; predator removal. (see Appendix V Protection Measures for Special-status Species)	**Impact**: short-term, significant, unavoidable; long-term, beneficial with mitigation **Mitigation**: preconstruction survey; rescue and relocate CRLF and Western pond turtles; monitoring; predator removal. (see Appendix V Protection Measures for Special status-Species)	**Impact**: short-term, significant, unavoidable; long-term, beneficial with mitigation **Mitigation**: preconstruction survey; rescue and relocate CRLF and Western pond turtles; monitoring; predator removal. (see Appendix V Protection Measures for Special-status-Species)	**Impact**: short-term, significant, unavoidable; long term beneficial with mitigation **Mitigation**: preconstruction survey; rescue and relocate CRLF and Western pond turtles; monitoring; predator removal. (see Appendix V Protection Measures for Special-status Species)	DOES NOT APPLY
WI-4: Notching OCRD *Effects on spawning habitat and herpetofauna*	**Impact**: short-term, less than significant with mitigation **Mitigation**: site habitat assessment and protocol surveys followed by agency consultation	**Impact**: short-term, less than significant with mitigation **Mitigation**: site habitat assessment and protocol surveys followed by agency consultation	**Impact**: short-term, less than significant with mitigation **Mitigation**: site habitat assessment and protocol surveys followed by agency consultation	**Impact**: short-term, less than significant with mitigation **Mitigation**: site habitat assessment and protocol surveys followed by agency consultation	DOES NOT APPLY
WI-5: Concrete Batch Plant Construction and Operation *Habitat for special-status species*	**Impact**: short-term, less than significant with mitigation **Mitigation**: preconstruction surveys and relocation of horned lizards and CRLF with barriers to prevent recolonization; Cooper's hawk nest surveys and avoidance, noise abatement; monitoring. clearing (see Appendix V Protection Measures for Special-status Species)	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WI-6: Tularcitos Access Road Construction *Effects to special-status species*	**Impact**: short-term, less than significant with mitigation **Mitigation**: minimize tree removal; pre-construction surveys and avoid dusky-footed woodrat nests; erosion controls; barriers; bat surveys along Tularcitos route and avoid roosts. (see Appendix V Protection Measures for Special-status species)	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
WI-7: Reservoir Drawdown without Sediment Removal *Effects on California red-legged frog (CRLF) habitat*	**Impact**: short-term significant unavoidable; long term beneficial with mitigation **Mitigation**: amphibian rescue and relocation; predator control; abundance surveys	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
Issue WI-8: Vegetation Removal and Construction-Related Disturbance *Effects on Special-Status Bird Species and Others Protected by the Migratory Bird Treaty Act or Raptor Protections*	**Impact**: short-term, less than significant with mitigation **Mitigation**: vegetation removal would be conducted between Mar. 1-Aug.1 to the extent possible. If vegetation removed outside Mar. 1-Aug 1 timeframe, implementation of preconstruction surveys and avoidance measures for special-status species and migratory birds would be implemented	**Impact**: short-term, less than significant with mitigation **Mitigation**: vegetation removal would be conducted between Mar. 1-Aug.1 to the extent possible. If vegetation removed outside Mar. 1-Aug 1 timeframe, implementation of preconstruction surveys and avoidance measures for special-status species and migratory birds would be implemented	**Impact**: short-term, less than significant with mitigation **Mitigation**: vegetation removal must be conducted between Mar. 1- Aug. 1, implementation of preconstruction surveys and avoidance measures for special-status species and migratory birds	**Impact**: short-term, less than significant with mitigation **Mitigation**: vegetation removal must be conducted between Mar. 1- Aug. 1, implementation of preconstruction surveys and avoidance measures for special-status species and migratory birds	DOES NOT APPLY
WI-9 Pre-Existing Access Road Improvements *Effects to special-status species*	**Impact**: short-term, less than significant with mitigation. **Mitigation**: minimize tree removal; map and flag active wood rat nests along route; routes planned to avoid dusky-footed woodrat nests; erosion controls; barriers; map, flag, and avoid roosts. (see Appendix V Protection Measures for Special-status Species) NOTE: Applies only to improvements to San Clemente Drive.	**Impact**: short-term, less than significant with mitigation **Mitigation**: minimize tree removal; map and flag active wood rat nests along route; routes planned to avoid dusky-footed woodrat nests; erosion controls; barriers; map, flag, and avoid roosts. (see Appendix V Protection Measures for Special-status Species) NOTE: Applies to improvements to San Clemente Drive and Cachagua and the Jeep Trail	**Impact**: short-term, less than significant with mitigation **Mitigation**: minimize tree removal; map and flag active wood rat nests along route; routes planned to avoid dusky-footed woodrat nests; erosion controls; barriers; map, flag, and avoid roosts. (see Appendix V Protection Measures for Special-status Species) NOTE: Applies to improvements to San Clemente Drive and Cachagua and the Jeep Trail	**Impact**: short-term, less than significant with mitigation **Mitigation**: minimize tree removal; map and flag active wood rat nests along route; routes planned to avoid dusky-footed woodrat nests; erosion controls; barriers; map, flag, and avoid roost. (see Appendix V Protection Measures for Special-status Species) NOTE: Applies to improvements to San Clemente Drive and Cachagua and the Jeep Trail	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WI-10: Reservoir Drawdown or Elimination with Sediment Removal *Effects on California red-legged frog (CRLF) habitat*	DOES NOT APPLY	**Impact**: short-term, significant, unavoidable; long-term; beneficial with mitigation **Mitigation**: amphibian rescue and relocation; predator control; hand vegetation clearing (see Appendix V Protection Measures for Special-status Species)	**Impact**: short-term, significant, unavoidable; long-term beneficial with mitigation **Mitigation**: amphibian rescue and relocation; predator control; hand vegetation clearing (see Appendix V Protection Measures for Special-status Species)	**Impact**: short-term, significant, unavoidable; long-term beneficial with mitigation **Mitigation**: amphibian rescue and relocation; predator control; hand vegetation clearing (see Appendix V Protection Measures for Special-status Species)	DOES NOT APPLY
WI-11: Sediment Removal *Destruction of spawning habitat*	DOES NOT APPLY	**Impact**: short-term, significant, unavoidable; long-term, beneficial with mitigation **Mitigation**: amphibian rescue and relocation; predator control; restrictions on vegetation clearing; abundance surveys	**Impact**: short-term, significant, unavoidable; long-term, beneficial with mitigation **Mitigation**: amphibian rescue and relocation; predator control; restrictions on vegetation clearing; abundance surveys	**Impact**: short-term, significant, unavoidable; long-term, beneficial with mitigation **Mitigation**: amphibian rescue and relocation; predator control; restrictions on vegetation clearing; abundance surveys	DOES NOT APPLY
WI-12: Sediment Transport And Disposal *Adverse effects to special-status species*	DOES NOT APPLY	**Impact**: long-term, less than significant with mitigation **Mitigation**: pre-construction surveys followed by implementation of BMPs	**Impact**: long-term, less than significant with mitigation **Mitigation**: pre-construction surveys followed by implementation of BMPs	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WI-13: Bypass Channel Excavation *Loss of habitat for special-status species*	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	**Impact**: long-term, significant, unavoidable **Mitigation**: rescue and relocate CRLF and Western pond turtles and presence/absence surveys for special-status species and flagging for avoidance	DOES NOT APPLY
WETLANDS					
WET-1: Permanent Loss of Wetlands and Other Waters of U.S. *Permanent loss of jurisdictional waters of the U.S.*	**Impact**: long-term, less than significant with mitigation **Mitigation**: Restoration, Mitigation & Monitoring Plan (in Botanical Resources Management Plan Appendix U).. Wetlands similar in function restored at a 3:1 ratio. Conservation easement or mitigation bank on similar, unaffected and fully functional wetlands at 3:1 ratio. Other waters restored or conserved at a 3:1 ratio. Final specifics of mitigation will be determined by the constraints of the 404(b) permit for the project	**Impact**: long-term, less than significant with mitigation **Mitigation**: Restoration, Mitigation & Monitoring Plan (in Botanical Resources Management Plan Appendix U). Wetlands similar in function restored at a 3:1 ratio. Conservation easement or mitigation bank on similar, unaffected and fully functional wetlands at 3:1 ratio. Other waters restored or conserved at a 3:1 ratio. Final specifics of mitigation would be determined by the constraints of the 404(b) permit for the project	**Impact**: long-term, less than significant with mitigation **Mitigation**: Restoration, Mitigation & Monitoring Plan (in Botanical Resources Management Plan Appendix U). Wetlands similar in function restored at a 3:1 ratio. Conservation easement or mitigation bank on similar, unaffected and fully functional wetlands at 3:1 ratio. Other waters restored or conserved at a 3:1 ratio. Final specifics of mitigation would be determined by the constraints of the 404(b) permit for the project	**Impact**: long-term, less than significant with mitigation **Mitigation**: Restoration, Mitigation & Monitoring Plan (in Botanical Resources Management Plan Appendix U). Wetlands similar in function restored at a 3:1 ratio. Conservation easement or mitigation bank on similar, unaffected and fully functional wetlands at 3:1 ratio. Other waters restored or conserved at a 3:1 ratio. Final specifics of mitigation would be determined by the constraints of the 404(b) permit for the project	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WET-2: Short-term Disturbance of Wetlands and Other Waters of U.S. *Short-term filling of fringe wetlands*	**Impact**: short-term, less than significant with mitigation **Mitigation**: in addition to Mitigation Measure WET-1, cofferdam timing and construction criteria, and protection of the plunge pool staging area. Replacement plantings at 3:1 ratio (see Mitigation VE-3)	**Impact**: short-term, less than significant with mitigation **Mitigation**: in addition to Mitigation Measure WET-1, cofferdam timing and construction criteria, and protection of the plunge pool staging area. Replacement plantings at 3:1 ratio (see Mitigation VE-3)	**Impact**: short-term, less than significant with mitigation **Mitigation**: in addition to Mitigation Measure WET-1, cofferdam timing and construction criteria, and protection of the plunge pool staging area. Replacement plantings at 3:1 ratio (see Mitigation VE-3)	**Impact**: short-term, less than significant with mitigation **Mitigation**: in addition to Mitigation Measure WET-1, cofferdam timing and construction criteria, and protection of the plunge pool staging area. Replacement plantings at 3:1 ratio (see Mitigation VE-3)	DOES NOT APPLY
WET-3: Indirect Impacts to Wetlands and other Waters of U.S. *Indirect adverse impacts to vegetation, including increased erosion and sedimentation*	**Impact**: short-term, less than significant with mitigation **Mitigation**: mitigated by implementation of Mitigation Measure VE-4	**Impact**: short-term, less than significant with mitigation **Mitigation**: mitigated by implementation of Mitigation Measure VE-4	**Impact**: short-term, less than significant with mitigation **Mitigation**: mitigated by implementation of Mitigation Measure VE-4	**Impact**: short-term, less than significant with mitigation **Mitigation**: mitigated by implementation of Mitigation Measure VE-4	DOES NOT APPLY
AIR QUALITY					
AQ-1: Dam Site Activities *Short-term emissions from construction equipment and road dust*	**Impact**: short-term, significant, unavoidable **Mitigation**: BMPs, including watering, chemical stabilization, and other measures	**Impact**: short-term, significant, unavoidable **Mitigation**: BMPs, including watering, chemical stabilization, and other measures	**Impact**: short-term, significant, unavoidable **Mitigation**: BMPs, including watering, chemical stabilization, and other measures	**Impact**: short-term, significant, unavoidable **Mitigation**: BMPs, including watering, chemical stabilization, and other measures	DOES NOT APPLY
AQ-2: Access Road Upgrades *Short-term dust and other emissions during access road improvements*	**Impact**: short-term, significant, unavoidable **Mitigation**: BMPs for dust suppression	**Impact**: short-term, significant, unavoidable **Mitigation**: BMPs for dust suppression	**Impact**: short-term significant, unavoidable **Mitigation**: BMPs for dust suppression	**Impact**: short-term significant, unavoidable **Mitigation**: BMPs for dust suppression	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
AQ-3: Project-Generated Traffic *Short-term dust and other emissions during project-related travel*	**Impact**: short-term, significant, unavoidable **Mitigation**: point of contact for residents to obtain corrective action when dust impacts occur which would include BMPs for dust suppression	**Impact**: short-term, significant, unavoidable **Mitigation**: point of contact for residents to obtain corrective action when dust impacts occur which would include BMPs for dust suppression	**Impact**: short-term, significant, unavoidable **Mitigation**: point of contact for residents to obtain corrective action when dust impacts occur which would include BMPs for dust suppression	**Impact**: short-term significant, unavoidable **Mitigation**: point of contact for residents to obtain corrective action when dust impacts occur which would include BMPs for dust suppression	DOES NOT APPLY
AQ-4: Concrete Batch Plant Operation *Operation of a new, short-term stationary source*	**Impact**: short-term, less than significant with mitigation **Mitigation**: compliance with MBUAPCD requirements under New Source Review rules	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
NOISE					
NO-1: Dam Site Activities *noise from construction equipment and activity*	**Impact**: short-term, significant, unavoidable **Mitigation**: limiting operations to daytime working hours	**Impact**: short-term, significant, unavoidable **Mitigation**: limiting operations to daytime working hours	**Impact**: short-term, significant, unavoidable **Mitigation**: limiting operations to daytime working hours	**Impact**: short-term, significant, unavoidable **Mitigation**: limiting operations to daytime working hours	DOES NOT APPLY
NO-2: Access Road Upgrades *noise generated during access road improvements*	**Impact**: short-term, significant, unavoidable **Mitigation**: use of quiet-design construction equipment, mufflers, enclosures; eliminate unnecessary idling; equipment maintenance and lubrication; timing restrictions for equipment use	**Impact**: short-term, significant, unavoidable **Mitigation**: use of quiet-design construction equipment, mufflers, enclosures; eliminate unnecessary idling; equipment maintenance and lubrication; timing restrictions for equipment use	**Impact**: short-term, significant, unavoidable **Mitigation**: use of quiet-design construction equipment, mufflers, enclosures; eliminate unnecessary idling; equipment maintenance and lubrication; timing restrictions for equipment use	**Impact**: short-term, significant, unavoidable **Mitigation**: use of quiet-design construction equipment, mufflers, enclosures; eliminate unnecessary idling; equipment maintenance and lubrication; timing restrictions for equipment use	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
NO-3: Project-Generated Traffic *noise from construction-related travel, including mobilization, materials, and workers*	**Impact**: short-term, significant, unavoidable **Mitigation**: implementation of mitigation for NO-2, and in addition low speed limits and restrictions on timing of worker travel and truck deliveries	**Impact**: short-term, significant, unavoidable **Mitigation**: implementation of mitigation for NO-2, and in addition low speed limits and restrictions on timing of worker travel and truck deliveries	**Impact**: short-term, significant, unavoidable **Mitigation**: implementation of mitigation for NO-2, and in addition low speed limits and restrictions on timing of worker travel and truck deliveries	**Impact**: short-term, significant, unavoidable **Mitigation**: implementation of mitigation for NO-2, and in addition low speed limits and restrictions on timing of worker travel and truck deliveries	DOES NOT APPLY
NO-4: Concrete Batch Plant Operation *noise from operation of a new short-term stationary source*	**Impact**: short-term, significant, unavoidable **Mitigation**: sound-damped conveyors, equipment enclosures, mufflers; use material piles at the plant as noise berms	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
Issue NO-5: Sediment Disposal Site 4R Activities *noise from construction related travel and activity*	DOES NOT APPLY	**Impact**: short-term, significant, unavoidable **Mitigation**: standard measures: limiting operations to normal daytime working hours to reduce noise nuisances would be routinely applied to construction activities near the Stone Cabin	**Impact**: short-term, significant, unavoidable **Mitigation**: standard measures: limiting operations to normal daytime working hours to reduce noise nuisances would be routinely applied to construction activities near the Stone Cabin	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
TRAFFIC & CIRCULATION					
TC-1: Road Segment Traffic Operations *Additional traffic on area road network*	**Impact**: short-term, less than significant with mitigation **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes a traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes a traffic coordination, trip reduction, and traffic safety, flagging, escort of transport trucks	**Impact**: short-term, significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes a traffic coordination, trip reduction, and traffic safety, flagging, escort of transport trucks	**Impact**: short-term significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes a traffic coordination, trip reduction, and traffic safety, flagging, escort of transport trucks	DOES NOT APPLY
TC-2: Intersection Traffic Operations *Changes to intersection level of service*	**Impact**: short-term, less than significant with mitigation **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes a traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
TC-3a: Traffic Safety Carmel Valley Road *Increased accident rates*	**Impact**: short-term, less than significant with mitigation Mitigation: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety **Mitigation** could also include funding additional traffic enforcement	**Impact**: short-term, less than significant with mitigation **Mitigation**: in addition to mitigation TC-1, fund additional enforcement, widen Cachagua Road	**Impact**: short-term, less than significant with mitigation **Mitigation**: in addition to mitigation TC-1, fund additional enforcement, widen Cachagua Road	**Impact**: short-term, less than significant with mitigation **Mitigation**: in addition to mitigation TC-1, fund additional enforcement, widen Cachagua Road	DOES NOT APPLY
TC-3b: Traffic Safety San Clemente Drive *Increased accident rates*	**Impact**: short-term, significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
TC-4: Inadequate Corner Sight Distances *Inadequate visual sight distance at intersections for stopping safety*	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant with mitigation **Mitigation**: improve affected intersections	**Impact**: short-term, less than significant with mitigation **Mitigation**: improve affected intersections	**Impact**: short-term, less than significant with mitigation **Mitigation**: improve affected intersections	DOES NOT APPLY
TC-5: New Intersections *Effect on safety and traffic*	**Impact**: short-term, less than significant with mitigation **Mitigation**: advance warning/signing; right turn taper on eastbound Carmel Valley Road approach to Tularcitos Access Road	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
TC-6: Neighborhood Quality of Life *Effect of increased traffic on residential neighborhoods*	**Impact**: short-term, significant, unavoidable Mitigation: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, significant unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, significant unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
TC-7: Pavement Loadings *Effect of project traffic on pavement*	**Impact**: short-term, less than significant with mitigation **Mitigation**: repair damage to affected roads immediately after construction is completed	**Impact**: short-term, less than significant with mitigation **Mitigation**: repair damage to affected roads immediately after construction is completed	**Impact**: short-term, less than significant with mitigation **Mitigation**: repair damage to affected roads immediately after construction is completed	**Impact**: short-term, less than significant with mitigation **Mitigation**: repair damage to affected roads immediately after construction is completed	DOES NOT APPLY
CULTURAL RESOURCES					
CR-1: Ground Disturbance *Disturbance to archaeological sites*	**Impact**: long-term, less than significant with mitigation **Mitigation**: construction monitoring, avoid 3 archaeological sites, or archeological evaluation and/or historical documentation of them	**Impact**: long-term, less than significant with mitigation **Mitigation**: construction monitoring, avoid archaeological sites, or archeological evaluation and/or historical documentation	**Impact**: less than significant with mitigation, long-term **Mitigation**: construction monitoring, avoid archaeological sites, or archeological evaluation and/or historical documentation	**Impact**: long-term, less than significant with mitigation **Mitigation**: construction monitoring, avoid archaeological sites, or archeological evaluation and/or historical documentation	DOES NOT APPLY
CR-2: Damage to Historic Structures from Construction-related Vibration *Construction-related vibration*	**Impact**: short-term, less than significant with mitigation **Mitigation**: rigid support of excavation structures to minimize ground movement	**Impact**: short-term, less than significant with mitigation **Mitigation**: rigid support of excavation structures to minimize ground movement	**Impact**: short-term, less than significant with mitigation **Mitigation**: rigid support of excavation structures to minimize ground movement	**Impact**: short-term, less than significant with mitigation **Mitigation**: rigid support of excavation structures to minimize ground movement	DOES NOT APPLY
CR-3: Introduction of Short-term Dirt/Unintended Damage *Construction/demolition-related accumulation of dirt*	**Impact**: short-term, less than significant with mitigation **Mitigation**: spray water on the ground surface prior to ground disturbance.	**Impact**: short-term, less than significant with mitigation **Mitigation**: spray water on the ground surface prior to ground disturbance.	**Impact**: short-term, less than significant with mitigation **Mitigation**: spray water on the ground surface prior to ground disturbance.	**Impact**: short-term, less than significant with mitigation **Mitigation**: spray water on the ground surface prior to ground disturbance.	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
CR-4: Demolition or Alteration to Historic Properties *Alterations to OCRD and associated fish ladder and to SCD*	**Impact**: long-term, significant, unavoidable **Mitigation**: recordation of resources (HABS/HAER), interpretive displays, educational program	**Impact**: long-term, significant, unavoidable **Mitigation**: recordation of resources (HABS/HAER), interpretive displays, educational program	**Impact**: long-term, significant, unavoidable **Mitigation**: recordation of resources (HABS/HAER), interpretive displays, educational program	**Impact**: long-term, significant, unavoidable **Mitigation**: recordation of resources (HABS/HAER), interpretive displays, educational program	DOES NOT APPLY
CR-5: Alteration of Surrounding Environment *Alter character of setting for San Clemente Dam Historic Resource District*	**Impact**: long-term, significant, unavoidable **Mitigation**: prepare NRHP Nomination Form for Historic District, complete Historic Preservation Management Plan, MOA	**Impact**: long-term, significant, unavoidable **Mitigation**: prepare NRHP Nomination Form for Historic District, complete Historic Preservation Management Plan, MOA	**Impact**: long-term, significant, unavoidable **Mitigation**: prepare NRHP Nomination Form for Historic District, complete Historic Preservation Management Plan, MOA	**Impact**: long-term, significant, unavoidable **Mitigation**: prepare NRHP Nomination Form for Historic District, complete Historic Preservation Management Plan, MOA	DOES NOT APPLY
CR-6: Introduction of Visual Obstructions *Loss of visual integrity for San Clemente Dam Historic Resource District*	**Impact**: long-term, significant, unavoidable **Mitigation**: photographic documentation, use of compatible design, materials and construction methods	**Impact**: long-term, significant, unavoidable **Mitigation**: photographic documentation, use of compatible design, materials and construction methods	**Impact**: long-term, significant, unavoidable **Mitigation**: photographic documentation, use of compatible design, materials and construction methods	**Impact**: long-term, significant, unavoidable **Mitigation**: photographic documentation, use of compatible design, materials and construction methods	DOES NOT APPLY
VISUAL RESOURCES (AESTHETICS)					
VQ-1: Residential Views on Hills East of Carmel Valley Road *Operation of construction equipment within the viewshed*	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
VQ-2: Changes to Viewsheds from Residences Adjacent to CVFP and SCD *Construction activities within the viewshed*	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	DOES NOT APPLY
VQ-3: Residential Views from Sleepy Hollow *Operation of construction equipment and ancillary facilities within the viewshed*	**Impact**: short-term, significant, unavoidable **Mitigation**: none available NOTE: This includes the proposed concrete batch plant	**Impact**: short-term, less than significant **Mitigation**: no mitigation required NOTE: This does not include the proposed concrete batch plant	**Impact**: short-term, less than significant **Mitigation**: no mitigation required NOTE: This does not include the proposed concrete batch plant	**Impact**: short-term, less than significant **Mitigation**: no mitigation required NOTE: This does not include the proposed concrete batch plant	DOES NOT APPLY
VQ-4: Changes to Viewsheds from the Stone Cabin *Construction activities within the viewshed of the Carmel River*	DOES NOT APPLY	**Impact**: short-term, less than significant, beneficial, long-term **Mitigation**: no mitigation required	**Impact**: short-term, less than significant, beneficial, long-term **Mitigation**: no mitigation required	**Impact**: short-term, less than significant, beneficial, long-term **Mitigation**: no mitigation required	DOES NOT APPLY
VQ-5: Changes to Viewsheds from the Jeep Trail *Construction activities within the viewshed*	DOES NOT APPLY	**Impact**: short-term, significant, unavoidable; long-term, less than significant with mitigation **Mitigation**: short-term-screening the sediment disposal site adjacent to the Jeep Trail with vegetation during construction; long term, revegetation of the sediment disposal site and the removal of the sediment conveyor overcrossing	**Impact**: short-term, significant, unavoidable; long-term, less than significant with mitigation **Mitigation**: short-term-screening the sediment disposal site adjacent to the Jeep Trail with vegetation during construction; long term, revegetation of the sediment disposal site and the removal of the sediment conveyor overcrossing	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
RECREATION					
REC-1: Access to Stone Cabin via Jeep Trail *Sediment pile blocked access via the Jeep Trail under the design for Site 4R proposed in the Draft EIR/EIS*	DOES NOT APPLY	**Impact**: short-term, less than significant **Mitigation**: no mitigation required. The alternative has been redesigned to move the disposal site uphill and provide a conveyor overcrossing. These changes would allow access to the cabin via the Jeep Trail during construction.	**Impact**: short-term, less than significant **Mitigation**: no mitigation required. The alternative has been redesigned to move the disposal site uphill and provide a conveyor overcrossing. These changes would allow access to the cabin via the Jeep Trail during construction.	DOES NOT APPLY	DOES NOT APPLY
REC-2: Disruption of Use of Jeep Trail to Stone Cabin *Heavy equipment traversing Jeep Trail*	DOES NOT APPLY	**Impact**: short-term, significant, unavoidable **Mitigation**: operation of heavy earth moving and other construction equipment would occur during normal working hours	**Impact**: short-term, significant and unavoidable **Mitigation**: operation of heavy earth moving and other construction equipment would occur during normal working hours	**Impact**: short-term, significant and unavoidable **Mitigation**: operation of heavy earth moving and other construction equipment would occur during normal working hours	DOES NOT APPLY
REC-3: Rerouting or Restoring the Carmel River Channel *Restore the river to its original free-flowing state*	DOES NOT APPLY	**Impact**: long-term, beneficial **Mitigation**: no mitigation required	**Impact**: long, term, beneficial **Mitigation**: no mitigation required	**Impact**: long-term, beneficial **Mitigation**: no mitigation required	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
REC-4: Deposition of Sediment on Site 4R *Sediment disposal on parkland*	DOES NOT APPLY	**Impact**: short-term significant, unavoidable; long-term, less than significant with mitigation **Mitigation**: following construction, the open space park site would be restored to close to its pre-project state. The site would return to use as open space parkland	**Impact**: short-term significant, unavoidable; long-term less than significant with mitigation **Mitigation**: following construction, the open space park site would be restored to close to its pre-project state. The site would return to use as open space parkland	DOES NOT APPLY	DOES NOT APPLY
LAND USE					
LU-1: Conflict with Existing Plans and Policies in the Project Area *Construction and operations changing the existing land use*	**Impact**: long-term, less than significant with mitigation **Mitigation**: land use permits issued by Monterey County Planning and Building Inspection Department would render this issue impact less than significant	**Impact**: short-term, significant, unavoidable; long-term, less than significant **Mitigation**: consultation with the Monterey Park District would be required to ensure desired restoration of Site 4R and the Jeep Trail following construction activities.	**Impact**: short-term, significant; unavoidable; long-term, less than significant **Mitigation**: consultation with the Monterey Park District would be required to ensure desired restoration of Site 4R and the Jeep Trail following construction activities.	DOES NOT APPLY	DOES NOT APPLY
ENVIRONMENTAL JUSTICE					
EJ-1: Minority and Low Income Populations *Disproportionate Impacts on Minority and Low Income Populations*	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	DOES NOT APPLY

Changes from Draft EIR/EIS to Final EIR/EIS

In response to comments received on the Draft EIR/EIS, additional information has been provided in this Final EIR/EIS which clarifies and amplifies the text and various determinations of significant impacts under CEQA.

Some of this information is in the form of additional sediment modeling which better define the impacts of specific actions – for example the sedimentation analysis described in Section 4.2 Hydrology and Water Resources and the Sediment Operations and Maintenance Plan (Appendix J). Some of the information is in the form of more detailed mitigation measures – for example a draft Storm Water Pollution Prevention Plan (Appendix K), a draft Spill Prevention, Containment, and Countermeasure Plan (Appendix R), a draft Biological Resources Plan (Appendix U) and a draft Special-Status Species Plan (Appendix V). Some impact issues have been divided into subsections or changed to rearrange impact analysis — for example in Section 4.2 Hydrology and Water Resources, several impact issues were rearranged so that impacts from construction and operation were separated and impacts upstream and downstream of the Dam were separated.

Several changes have been made to the alternatives that reduce impacts – for example, the sediment disposal site was moved from an area where it blocked access to the Stone Cabin, and the time for closure of the SCD fish ladder was moved later in the season when fish migration upstream is unlikely. Additional resource sections have been added based on public comment received — for example, Section 4.12 on Recreation and 4.13 on Land Use.

The discussion below identifies changes within each impact area. Further clarification is provided in the specific impact sections.

No Project Alternative

As described above, the No Project alternative would leave the Dam, and its existing facilities in place. A new fish ladder would not be constructed, the OCRD would not be notched and sediment behind the Dam would be left in place. These actions were evaluated as part of the No Project Alternative in the Draft EIR/EIS, but have been removed from the Final EIR/EIS to allow the report to conform more closely to the intent of a No Project (No Action) alternative under NEPA and CEQA and to be consistent with the NOP. Since the No Project Alternative is considered unlikely because it would leave the Dam out of compliance with DSOD standards, the changes are not discussed in the comparisons below.

Geology

Geological and soils effects under all alternatives would be less than significant or mitigable to levels less than significant with the exception of the seismic risk and erosion at the left Dam abutment causing SCD failure, leading to downstream flooding. This would be significant and unavoidable under the No Project Alternative, but would be

avoided by the selection of the Proponent's Proposed Project or any of its action alternatives.

In response to comments received on the Draft EIR/EIS, additional information has been provided in this Final EIR/EIS which clarifies and amplifies the following determination of significant impacts under CEQA:

- **Issue GS-5: Bypass Rock Removal by Blasting**: Blasting entails safety hazards and could trigger landslides on unstable slopes. The significance determination has been changed from less than significant to less than significant with mitigation. Preliminary blasting BMPs have been incorporated into the SWPPP (Appendix K). Implementation of additional measures in a complete blasting plan (required as part of final construction specifications) would reduce blasting-related impacts to a less than significant level.

Hydrology and Water Resources

The key factor differentiating alternatives for this resource area is the change in the flux of sediment passing the SCD site. The amount and composition of sediment passing downstream drives changes in riverine sediment composition, riverine sediment storage, channel bed geometry, and the elevation of the 100-year floodplain.

Under the Proponent's Proposed Project and Alternative 1, the SOMP (Appendix J) would be used to regulate downstream sediment releases. Neither of these alternatives would have significant and unavoidable effects on sediment flows, storage, composition, deposition, suspended sediments, channel geometry, or the 100-year flood elevation. Implementation of the SOMP and water quality BMPs included in the Storm Water Pollution Prevention Water Quality Protection Plan (Appendix K) would reduce any impacts to levels less than significant. In a few cases, impacts could be beneficial (e.g., to sediment deposition in the lower river).

The dam removal alternatives (Alternatives 2 and 3) would have significant, unavoidable short-term effects on sediment flow, composition, and storage during construction due to sediment mobilized from restored stream channels. Both alternatives would significantly increase the frequency of high suspended sediment concentrations in the Carmel River downstream of SCD. Under these alternatives, the Dam would be removed and the largest amount of sediment transport would occur past the Dam site and down the Carmel River. Alternative 2 would experience the largest component of sediment transport past the dam site because Alternative 3 retains the lower gradient reach upstream of the bypass channel, similar to a hung valley in a natural river system, that would store some of the sediment transported from upstream. Sediment may be mobilized from the unexcavated sediment remnants in the restored stream channels under Alternatives 2 and 3. Under Alternative 2, the river would return to its pre-dam sediment transport rate in the inundation zone, however Alternative 2 would have long-term significant and unavoidable impacts on sediment deposition and channel geometry in the lower Carmel River. No mitigation is available for these impacts.

Under the No Project Alternative, the reservoir would fill at the same rate as under existing conditions and some sediment would be passed downstream. In response to comments received on the Draft EIR/EIS, several of the Impact Issues were disaggregated into separate issues in the Final EIR/EIS and additional information has been provided which clarifies and amplifies the discussion of these impacts: WR-2 became WR-2a, 3a, 3b, 4a, and 4b; WR-3 became a portion of 2b and WR-4 became a portion of 2b and 4a. The issues addressed in each of the refined impacts issues are briefly described below and in more detail in Section 4.2.

- **WR-2a: Changes in Sediment Flow Passing the San Clemente Dam Immediately after Construction**. This impact issue was clarified to apply to conditions immediately after construction. Further modeling determined that the short-term impact of Issue WR-2a would be significant and unavoidable under Alternatives 2 and 3 (instead of less than significant with mitigation for WR-2 in the Draft EIR/EIS). For Alternative 1, the determination changed from less than significant with mitigation to no mitigation required.

- **WR-2b: Changes in Sediment Storage and Composition in the Lower River during Construction**. This issue applies only to short-term impacts (whereas the Draft EIR/EIS issues WR-3 and WR-4 included both short- and long-term considerations). Further modeling determined that this impact would not be significant and unavoidable for all the action alternatives, as stated in the draft. It was determined to be less than significant with mitigation under the Proponent's Proposed Project and Alternative 1; and significant and unavoidable under Alternatives 2 and 3.

- **WR-3a: Change in Sediment Deposition in the Reservoir.** This impact issue addresses long-term effects of sediment deposition. It would be less than significant with mitigation and potentially beneficial under the Proponent's Proposed Project and Alternatives 1, and less than significant with mitigation under Alternatives 2, 3, and 4.

- **WR-3b: Increased Sediment Deposition that Obstructs Fish Passage**. This impact issue addresses long-term effects of sediment deposition. It is less than significant with mitigation under all project alternatives (but under Alternative 2, no mitigation is required). Under Alternative 4 (No Project), it is significant and unavoidable.

- **WR-4a: Increased Sediment Deposition in the Lower River**. This impact issue addresses long-term effects of sediment deposition. It was less than significant, potentially beneficial under the Proponent's Proposed Project and Alternatives 1 and 4; less than significant with no mitigation required under Alternative 3; and significant and unavoidable under Alternative 2.

- **WR-4b: Increase in frequency of High suspended Sediment Concentrations**. This impact issue addresses long-term effects of sediment deposition. It was determined to be less than significant with no mitigation under the Proponent's

Proposed Project, Alternative 1 and Alternative 4; and significant and unavoidable under Alternatives 2 and 3.

- **WR-5: Changes in Channel Bed Geometry**. This issue is numbered as it was in the Draft EIR/EIS. It would be less than significant with mitigation for all project alternatives in the Draft EIR/EIS. Further modeling conducted for the Final EIR/EIS determined it would be less than significant with no mitigation required under the Proponent's Proposed Project and Alternatives 1, 3 and 4 and significant and unavoidable under Alternative 2.

- **WR-6: Changes to the 100-year Flood Elevation**. This issue is numbered as it was in the Draft EIR/EIS. Further modeling conducted for the Final EIR/EIS determined this issue would be less than significant with no mitigation required under the Proponent's Proposed Project and Alternatives 1, 3 and 4 and significant and unavoidable under Alternative 2.

- **WR-7: Impact to the Location or Timing of Water Supply Diversions**. This issue is numbered as it was numbered in the Draft EIR/EIS. The issue has also been clarified to consider the location and timing of water supply diversions. For the Draft EIR/EIS, no mitigation would be required (although screening of the intake was proposed); in the Final EIR/EIS, mitigation would be required, consisting of operating the diversion to maintain fish passage flows from January through May.

Water Quality

Sluicing under the Proponent's Proposed Project and Alternative 1 would lead to increases in turbidity in the Carmel River below the Dam. All of the action alternatives entail construction activities, where the fish ladder would be replaced and the OCRD would be notched. The Proponent's Proposed Project and the action alternatives all would involve partial or complete dewatering of the construction areas and plunge pool for from one to four construction years. Activities at construction sites and along access roads where new routes or improvements are undertaken would entail potential discharge of contaminants to watercourses in the Project Vicinity, including the Carmel River, San Clemente Creek, and Tularcitos Creek. These would include localized scour, stream bed disturbance, and erosion leading to sediment discharge, suspended sediment and turbidity. Other effects would include changes in temperature and levels of dissolved oxygen and accidental spills and leaks of toxic substances.

In response to comments received on the Draft EIR/EIS, additional information has been provided in this Final EIR/EIS which clarifies and amplifies the following determinations of significant impacts under CEQA:

- **Issue WQ-9: Reservoir Drawdown**. Under Alternatives 2 and 3, the reservoir would be completely dewatered during project implementation; the impacts would be the same as in the Proponent's Proposed Project and Alternative 1 and would be significant and unavoidable.

- **Issue WQ-10: Reservoir Sediment Excavation**. Under Alternatives 2 and 3, the sediment would be excavated from the reservoir during project implementation; the impacts would be the same as Alternative 1 except sediment excavation quantities would be different, (2.5 million cubic yards for Alternative 2 and 500,000 cubic yards for Alternative 3). Very fine suspended sediments and iron oxides would be expected to remain in suspension in the reservoir, resulting in elevated turbidity and decreased dissolved oxygen levels during the two periods of excavation activity and for about two months following excavation. The impacts would be significant and unavoidable.

Fisheries

The Proponent's Proposed Project and action alternatives entail a number of activities which would cause the short-term loss and degradation of aquatic habitats and cause mortality to fish. Some of these (e.g., replacing bridge piers, fish rescues and relocations, and notching the OCRD), are similar among all of the action alternatives.

Sluicing to manage sediment accumulations behind SCD would cause limited short term increases in suspended sediment and turbidity that would be repeated each year, leading to less than significant impacts on fish as the increases would be similar to the turbidity caused during a storm event. Restoring the sediment transport capacity past the Dam would increase suspended sediment levels downstream of SCD and increase the volume of coarse sediment delivered to the river channel downstream of the Dam. This increase can have short term significant adverse impacts and long-term beneficial impacts to habitat conditions in the lower river.

Construction-related diversions of the Carmel River and San Clemente Creek would have greater impacts for Alternatives 1, 2, and 3, than for the Proponent's Proposed Project because of the increased number of years needed to complete these projects. Depending on permit conditions, construction-related stream diversions would last for one to two years under the Proponent's Proposed Project, two to three years for Alternatives 1 and 3, and three to four years for Alternative 2. The annual effects of dewatering the plunge pool, the reservoir area, and diverting the inflowing streamflow around the reservoir area would be somewhat similar in the same construction year across the alternatives with effects varying depending on the number of construction years and extent of the area to be dewatered. Reservoir drawdown would be required under all the alternatives as well, but would not last as long or be as severe under the No Project Alternative (this alternative would entail the continuation of "interim drawdowns" until the reservoir fills with sediment).

The Proponent's Proposed Project and all the action alternatives would entail less-than-significant impacts from closing the fish ladder during construction because diversion activities in the river or dewatering the reservoir would not be conducted until May 31, or when flows passing SCD are less than 50 cfs, which ever comes first. Upstream fish passage at the Dam would be completely mitigated by dam removal under Alternatives 2 and 3. Under the Proponent's Proposed Project and Alternative 1 the fish ladder

would be improved but the Dam would remain in place. Downstream fish passage impacts would continue as an existing condition for fish moving over the Dam under the Proponent's Proposed. Under Alternative 1, in addition to an improved ladder, the functional height of the Dam would be reduced by about 20 feet. Under Alternative 4, no new ladder be provided and impacts would continue consistent with existing conditions. A comparison of steelhead access issues for upstream adults or downstream juveniles or kelts moving past the dam site with proposed mitigation measures is provided in Table 2-2. Notching the OCRD would be done late in the season when movement in the river would be minimal for all the action alternatives.

Relocating the CAW water supply diversion further upstream on the Carmel River would be necessary under Alternatives 1, 2, and 3, and would affect flows downstream from the diversion point to the Dam to a less than significant level on fish after an operation plan is implemented to provide flow for steelhead. The Proponent's Proposed Project and Alternative 4 would keep the diversion where it is, so flows upstream of the Dam would not be affected.

In response to comments received on the Draft EIR/EIS, additional information is provided in this Final EIR/EIS which clarifies and amplifies the following determinations of significant impacts under CEQA:

- **Issue FI-3: Operation of a Trap and Truck Facility at OCRD**. Operation of a Trap and Truck facility at OCRD has been eliminated from the fisheries impact issues. In the Draft EIR/EIS, operation of the Trap and Truck facility was proposed as mitigation for Fish Ladder Closure (Impact Issue FI-7) which was anticipated to occur in late April or May. The earliest diversion and dewatering-related actions would begin is May 31. This time frame has virtually eliminated the Fish Ladder Closure Issue and has therefore eliminated the necessity to operate a Trap and Truck facility at the ORCD.

Table 2-2: Comparison of Fish Access Issues by Alternative

ACCESS ISSUES BY ALTERNATIVE					OCRD NOTCH	
			OPERATION			
ACCESS	UPSTREAM	DOWNSTREAM	UPSTREAM	DOWNSTREAM	BOTH U/S AND D/S	BOTH U/S AND D/S
PROPONENT'S PROPOSED PROJECT	LIMITED FISH RESCUE AND RELOCATION FOR 1 YEAR	RESCUE AND RELOCATION FOR 1 YEAR	NEW LADDER	NEW LADDER AND SPILLWAY	UPSTREAM –N/A, DOWNSTREAM RESCUE AND RELOCATION	RIVER
ALTERNATIVE 1	FISH RESCUE AND RELOCATION FOR2 YEARS	RESCUE AND RELOCATION FOR 2 YEARS	NEW SHORTER LADDER	NEW SHORTER LADDER AND SPILLWAY	UPSTREAM –N/A, DOWNSTREAM RESCUE AND RELOCATION	RIVER
ALTERNATIVE 2	FISH RESCUE AND RELOCATION FOR 3 YEARS	RESCUE AND RELOCATION FOR 3 YEARS	RIVER	RIVER	UPSTREAM –N/A, DOWNSTREAM RESCUE AND RELOCATION	RIVER
ALTERNATIVE 3	FISH RESCUE AND RELOCATION FOR 2 YEARS	RESCUE AND RELOCATION FOR 2 YEARS	RIVER	RIVER	UPSTREAM –N/A, DOWNSTREAM RESCUE AND RELOCATION	RIVER
NO PROJECT	NONE	NONE	EXISTING LADDER	EXISTING LADDER AND EXISTING SPILLWAY	UPSTREAM –N/A, DOWNSTREAM RESCUE AND RELOCATION	RIVER

- **FI-9a: Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream**. This impact issue was the original FI-9 in the Draft EIR/EIS and the determination has been changed from significant, unavoidable to less than significant for the Proponent's Proposed Project, and Alternative 1. For Alternatives 2 and 3, although the long-term impact is beneficial, the short-term impact for Alternative 2 remains significant and unavoidable. The short-term impact for Alternative 3 is less than significant. The change is based on the additional analyses conducted on suspended sediment levels from sluicing to downstream channels. Impacts from exposure to suspended sediment from the Proponent's Proposed Project and Alternative 1 to downstream resources are similar to impacts that occur during storm events and would take place during storm events.

- **FI-9b: Impacts to Fish from Excavation or Dredging of Sediment for Fish Passage**. In response to comments received on the Draft EIR/EIS, the SOMP (Appendix J) has been expanded to include other methods for managing sediment, in addition to sluicing. This impact issue has been added to include impacts to fish passage upstream of the Dam that could be caused by these methods. It applies to the Proponent's Proposed Project and Alternative 1. The benthic habitat that would be dredged to maintain fish passage consists of fine sediments that have recently accumulated behind the Dam and is of very low habitat quality. These fine sediments have low invertebrate productivity and provide no spawning and limited rearing habitat. Juvenile and adult fish are known to easily avoid suction dredges (Harvey and Lisle 1998), so steelhead mortality is expected to be uncommon. The impact would be less than significant.

- **FI-12: Downstream Fish Passage over SCD**. In the Draft EIR/EIS, this issue was applied to Alternatives 2 and 3 and the determination would be beneficial because dam removal would allow unobstructed passage. However, the impact applies to passage over the existing Dam and therefore does not apply to Alternatives 2 and 3 because the Dam would be removed. This Final EIR/EIS has been revised to reflect this determination.

Vegetation and Wildlife

The Proponent's Proposed Project and all of the action alternatives affect terrestrial vegetation and wildlife habitat. The comparative acreages of vegetation (excluding water areas) affected are shown in Table 2.3. The Proponent's Proposed Project affects a relatively minor amount of vegetation (3.4 acres, not including water), while Alternatives 1 and 2 affect the most vegetation (about 41.8 acres and 61.4 acres respectively), due to the inclusion of the sediment disposal site in their totals and the additional sediment removal area for Alternative 2. Alternative 3 affects about 44.7 acres. Open water was removed from Table 2.3 to retain the focal point of the Table on vegetation affected. The No Project Alternative avoids these impacts.

Table 2-3: Vegetation Potentially Affected by Proponent's Proposed Project and Alternatives

Alternative	TOTAL	Annual grassland	Arroyo willow series	Blue oak series	Black sage series	Central Coast cottonwood-sycamore riparian forest	Chamise series	Chamise-black sage series	Coast live oak series	California sagebrush - black sage series	Developed	Emergent wetland	Mock heather scrub	Mulefat series	Mulefat-willow riparian	Ruderal	Sandbar	Sandbar annuals	California sycamore riparian-coast live oak	California sycamore riparian-mock heather scrub	California sycamore series	White alder riparian	White alder-willow riparian	Willow riparian
Proponent's Proposed Project	3.4	0.2	0.02	0.003	0.004	0.7	0.1	0.08	1.0	0.04	0.04	0	1.0	0	0	0.05	0	0	0.02	0.2	0.04	0	0	0
Alternative 1	41.8	3.8	0	0.003	0.004	1.3	0.6	0.6	20.1	0.1	0.2	0.02	0	0	0.02	0.01	0.4	1.8	0	0	0.04	0	11.9	1.0
Alternative 2	61.4	6.6	0	0.003	0.004	1.3	1.0	1.1	26.3	0.3	0.2	0.02	0	1.2	0.6	0.01	2.7	1.8	0	0	0.04	0.1	17.0	1.0
Alternative 3	44.7	7.1	0	0.003	0.1	0.2	1.5	0.3	9.6	0.0	0.04	0.02	0	1.2	0.6	0.01	2.0	1.8	0	0	0.04	0.1	18.9	1.0
Alternative 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

The Proponent's Proposed Project and Alternative 1 may disrupt bat nesting areas, and Alternatives 1, 2, and 3 may displace special-status bats, due to dam-related construction. All action alternatives may affect California red-legged frogs (CRLFs). The Proponent's Proposed Project and Alternative 4 would preserve existing CRLF habitat and Alternative 1 preserves a lesser amount of frog habitat. Alternative 2 would remove habitat in the San Clemente arm and temporarily eliminate it from the sediment storage area of the Carmel River arm, but would have minimal effects on habitat upstream from the bypass channel on the Carmel River. However, the Proponent's Proposed Project and all action alternatives would include mitigation to improve CRLF habitat in areas along the Carmel River not being affected by the project, resulting in overall improvement to the CRLF community. The concrete batch plant associated with the Proponent's Proposed Project may affect horned lizards and Cooper's hawks. Brushland and riparian habitat clearing and excavation would remove some habitat for special-status species during the bypass channel excavation under Alternative 3 which would be a significant impact. Alternatives 1 and 2 would entail potential effects to terrestrial habitat and species at the sediment disposal site that the other alternatives would not required.

In response to comments received on the Draft EIR/EIS, additional information is provided in this Final EIR/EIS which clarifies and amplifies the following determinations of significant impacts under CEQA:

- **WI-3 Cofferdam Construction and Plunge Pool Dewatering**: This impact issue was the original WI-3 in the Draft EIR/EIS and has been changed from significant, unavoidable to short-term, significant, unavoidable; long-term, beneficial with mitigation for all the action alternatives. Overall, it was determined that the mitigation for the CRLF as described in Appendix V, Protection Measures for Special-status Species, would enhance the habitat in the long-term compared to the existing conditions for Alternatives 1, 2, and 3. However, the impact would remain significant and unavoidable initially, for the Proponents Proposed Project and Alternatives 1, 2, and 3, because there is still the potential to impact the sensitive species and their habitat near the plunge pool dewatering in the short-term.

- **WI-7 Reservoir Drawdown without Sediment Removal**. The original WI-7 in the Draft EIR/EIS has been changed from significant, unavoidable to short-term significant, unavoidable; long-term, beneficial with mitigation. As was the case in the Draft EIR/EIS, this impact only applies to the Proponent's Proposed Project. Overall it was determined that the mitigation for the CRLF as described in Appendix V, Protection Measures for Special-status Species, would enhance the habitat in the long-term compared to the existing conditions. However, the impact would remain significant and unavoidable initially because the potential remains for short-term impacts to CRLF individuals and their habitat near the reservoir.

- **WI-9 Pre-Existing Access Road Improvements**. In the Draft EIR/EIS, this impact issue was formerly titled Cachagua Access Road Improvements, and WI-9 did not apply to the Proponent's Proposed Project. However, in the Final EIR/EIS, this

impact issue was refined to include improvements to San Clemente Drive. Widening and improving the existing access road could potentially result in minor indirect impacts to Monterey dusky-footed wood rat, pallid bat, and other special-status wildlife species. Therefore, WI-9, in the short-term, would be less than significant with mitigation described in Appendix V, Protection Measures for Special-status Species for the Proponent's Proposed Project. This does not alter impact determinations for the other alternatives reflected in the Draft EIR/EIS.

- **WI-10 Reservoir Drawdown or Elimination with Sediment Removal**: The original WI-10 in the Draft EIR/EIS has been changed from significant, unavoidable to short-term, significant, unavoidable; long-term, beneficial with mitigation. As was the case in the Draft EIR/EIS, this impact applies to Alternatives 1, 2, and 3. Overall, it was determined that the mitigation for the CRLF as described in Appendix V, Protection Measures for Special-status Species, would enhance the habitat in the long-term compared to the existing conditions. However, the impact would remain significant and unavoidable initially because the potential remains for short-term impacts to CRLF individuals and their habitat near the reservoir during reservoir drawdown with sediment removal.

- **WI-11 Sediment Removal**. The original WI-11 in the Draft EIR/EIS has been changed from significant, unavoidable to short-term, significant, unavoidable; long-term, beneficial with mitigation. Overall, it was determined that the mitigation for the CRLF as described in Appendix V, Protection Measures for Special-status Species, would enhance the habitat in the long-term compared to the existing conditions for Alternatives 1, 2, and 3. However, the impact would remain significant and unavoidable in the short-term for Alternatives 1, 2, and 3, because the potential remains for some loss either during removal of CRLFs and tadpoles, Coast Range newt larvae, and western pond turtle juveniles and hatchlings from the sediment bed before commencing vegetation removal or sediment excavation, or if individuals are missed during rescue operations.

Wetlands

The Proponent's Proposed Project and all of the action alternatives would affect wetlands and certain waters of the U.S. The comparative acreages of wetlands affected are shown in Table 2-4. The Proponent's Proposed Project would affect a relatively minor amount of wetland area and other Waters of the U.S. (about 7.8 acres). Alternative 1 affects a larger area (about 8.8 acres). Alternative 2 would affect the largest area (12.5 acres), while Alternative 3 would affect an intermediate acreage (about 10.8 acres), due to the inclusion of the sediment disposal site in their totals and the additional sediment removal area for Alternative 2. The No Project Alternative avoids these impacts. No changes were made to determinations of significant impacts from the Draft EIR/EIS. All ratios for restoration or for conservation are 3:1 in this Final EIR/EIS (in the draft EIR/EIS, some ratios were 1:1). This reflects current mitigation requirements for wetlands.

Table 2-4: Area of Waters of the U.S. and Potential Jurisdictional Wetlands Potentially Impacted by Proponent's Proposed Project and Alternatives

	Other Waters of the U.S. (acres)	Potential Jurisdictional Wetlands (acres)
Proponent's Proposed Project		
Access Road (Bridge)		0.02
Reservoir pool	6.8	
Plunge pool	0.2	0.04
Carmel River downstream of plunge pool	0.2	0.30
Tularcitos crossing	0.03	0.01
Concrete ford	0.1	0.06
TOTAL	**7.33**	**0.43**
Alternative 1		
Site 4R channel	0.12	
Access Road (Bridge)		0.02
Carmel River, San Clemente Creek, and Reservoir Pool	7.3	0.02
Plunge Pool	0.2	0.04
Carmel River downstream of plunge pool	0.3	0.6
Concrete ford	0.1	0.06
TOTAL	**8.02**	**0.7466**
Alternative 2		
Site 4R channel	0.12	
Access Road (Bridge)		0.02
Carmel River, San Clemente Creek, and Reservoir Pool	10.9	0.2
Plunge pool	0.2	0.04
Carmel River downstream of plunge pool	0.3	0.6
Concrete Ford	0.1	0.06
TOTAL	**11.62**	**0.92**
Alternative 3		
Access Road (Bridge)		0.02
Carmel River, San Clemente Creek, and Reservoir Pool	10.4	0.2
Concrete ford	0.1	0.06
TOTAL	**10.5**	**0.28**
Alternative 4		
No direct impacts		

Air Quality

All of the action alternatives would have similar effects on air quality. Alternative 2 would have the greatest effects due to the extended construction/sediment excavation schedule.

In response to comments received on the Draft EIR/EIS, additional information is provided in this Final EIR/EIS which clarifies and amplifies the following determinations of significant impacts under CEQA. The effects would only occur during construction

and mitigation measures were included in the Draft EIR/EIS. However, some of the effects could contribute to exceedances of local thresholds of significance. Others may be above the level that is normally acceptable to local residential areas. Therefore even though the impact levels for these determinations are substantially the same as they were in the Draft EIR/EIS, the impact determination has been changed from less than significant with mitigation to short-term, significant and unavoidable. There would be no air quality related impacts associated with the No Project Alternative.

- **AQ-1: Dam Site Activities**. Construction activities would generate short-term emissions from diesel-powered equipment and road dust. In the Draft EIR/EIS, impacts from these emissions were determined to be less than significant with mitigation for all the alternatives; however, if not mitigated, fugitive dust could exceed the MBUAPCD construction threshold of significance[1] for $PM_{10.;}$ In addition, ambient air quality in distant residential areas or at the Dam site from NO_X emissions may be above the mass emissions significance threshold set by the MBUAPCD. Therefore, the impact determination would be short-term, significant and unavoidable for all of the action alternatives. There would be no air quality related impacts associated with the No Project Alternative.

- **AQ-2: Access Road Upgrades**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant with mitigation for the Proponent's Proposed Project and Alternatives 1, 2, and 3. However resultant dust emissions at some times and at some locations may be above what is normally acceptable to residences of Sleepy Hollow; therefore the impact determination would be short-term, significant and unavoidable. There would be no air quality related impacts associated with the No Project Alternative.

- **AQ-3: Project-Generated Traffic**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant with mitigation for all of the alternatives. However, PM_{10} emissions could exceed the MBUAPCD threshold during material deliveries and concrete placement, primarily due to travel on unpaved roads between the Filter Plant and Dam. Therefore, the resulting impact would be short-term, significant and unavoidable for all the action alternatives. There would be no air quality related impacts associated with the No Project Alternative.

Noise

All of the action alternatives would have similar effects on noise for access road upgrades and project-generated traffic even though different access routes may be used. Alternative 2 would have the greatest effects due to the extended construction/sediment excavation schedule. Residences along San Clemente Drive may be affected by construction associated with the Proponent's Proposed Project and the action alternatives resulting from the increase in noise from traffic, access road construction and improvements. Of all the action alternatives, they would experience the least volume of noise from traffic with the Proponent's Proposed Project. The batch

[1] MBUAPCD, CEQA Air Quality Guidelines, October 1995 (last revised June 2004), Figure 5-1

plant for the Proponent's Proposed Project may also impact sensitive receptors in the area. For Alternatives 1, 2, and 3, visitors to the Stone Cabin and other Jeep Trail users may also experience increased noise along Cachagua Road and the Jeep Trail. There would be no noise related impacts associated with the No Project Alternative.

In response to comments received on the Draft EIR/EIS, additional information is provided in this Final EIR/EIS which clarifies and amplifies the following determinations of significant impacts under CEQA. The effects would be short-term and mitigation measures were included in the Draft EIR/EIS. However, some of the effects may be above the level that is normally acceptable to local residential areas. Therefore even though the impact levels for these determinations are substantially the same as they were in the Draft EIR/EIS, the impact determination has been changed from less than significant or less than significant with mitigation to short-term, significant and unavoidable.

- **NO-1: Dam Site Activities**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant, no mitigation required for all of the alternatives. However, resultant noise levels at some times and at some locations may be above the normally acceptable range and/or more than 5 dBA above background. Therefore, the resulting impact would be short-term, significant and unavoidable for the action alternatives. Although impacts would be significant and unavoidable, these instances would be transient and short-term. There would be no noise related impacts associated with the No Project Alternative.

- **NO-2: Access Road Upgrades**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant, with mitigation required for all of the action alternatives. However, resultant noise levels at some times and at some locations may be above the normally acceptable range and/or more than 5 dBA above background. Therefore, the resulting impact would be short-term, significant and unavoidable for the action alternatives. Although impacts would be significant and unavoidable, these instances would be transient and short-term.

- **NO-3: Project-Generated Traffic**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant, with mitigation required for all of the alternatives. However, resultant noise levels at some times and at some locations may be above the normally acceptable range and/or more than 5 dBA above background. Therefore, the resulting impact would be short-term, significant and unavoidable for the action alternatives. Although impacts would be significant and unavoidable, these instances would be transient and short-term. There would be no noise related impacts associated with the No Project Alternative.

- **NO-4: Concrete Batch Plant Operation**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant, with mitigation for the Proponent's Proposed Project and did not apply to the other alternatives. However, resultant noise levels at some times and at some locations may be above the normally acceptable range and/or more than 5 dBA above background. Therefore,

the resulting impact would be short-term, significant and unavoidable for the Proponent's Proposed Project. Receptors that could be disturbed by plant noise would be limited to two properties on San Clemente Drive that are within about 150 meters of the plant. These impacts would only apply to the Proponent's Proposed Project and would be short-term in duration and limited to the period of construction.

- **Issue NO-5: Sediment Disposal Site 4R Activities**. This issue was added because the disposal site for Alternatives 1 and 2 would be close to a recreational residence called the Stone Cabin. The spatial relationship of the Jeep Trail to the Stone Cabin would significantly reduce noise impacts on the Stone Cabin, however, given the sparsely populated rural nature of the area it cannot be determined with certainty that the impact would be less than significant; therefore the impact would be short-term significant and unavoidable.

Traffic and Circulation

All of the alternatives would have mitigable effects in creating additional traffic on the area road network. Those with the longer construction schedules and larger workforces would have the larger effects. However, under Alternatives 1, 2, and 3 during the construction of the Jeep Trail improvements, non-project related traffic traveling on the Jeep Trail would be subjected to delays of unknown duration which would be significant. None of the alternatives would significantly affect level of service at intersections. Alternatives 1, 2, and 3 would require improvements to the intersection of Cachagua Road with Carmel Valley Road. The Proponent's Proposed Project would create a new intersection on Carmel Valley Road (with the new Tularcitos Access Route). Alternatives 2, 3, and 4 would entail minor additional amounts of traffic through local residential neighborhoods on San Clemente Drive (avoided by the Tularcitos Access Route for the Proponent's Proposed Project after construction of the new route). All of the alternatives could damage pavement on local roads.

In response to comments received on the Draft EIR/EIS, additional information is provided in this Final EIR/EIS which clarifies and amplifies the following determinations of significant impacts under CEQA. The effects would be short-term and mitigation measures were included in the Draft EIR/EIS. However, some of the effects may be above the level that is normally acceptable to local residential areas. Therefore even though the impact levels are the substantially the same as they were in the Draft EIR/EIS, the impact determination has been changed from less than significant with mitigation to unavoidable and significant.

- **TC-1: Road Segment Traffic Operations**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant, with mitigation required for all of the alternatives. However, Under Alternatives 1, 2, and 3, non-project related traffic using the Jeep Trail would be subjected to delays during the construction of improvements to the Jeep Trail. The impact of the project during the construction of improvements to the Jeep Trail would be short-term, significant, and unavoidable because it is not known how long of a delay a motorist would experience during the

road construction period. There would be no traffic related impacts associated with the No Project Alternative.

- **TC-2: Intersection Traffic Operations**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant. However, under the Proponent's Proposed Project the residents along San Clemente Drive may experience a short-term delay during AM and PM peak hours upon departure and return to their residents. Although the level of impact for this issue has not changed the determination would be short-term less than significant with mitigation to reduce the number of trips and coordinate traffic. There would be no traffic related impacts associated with the No Project Alternative.

- **TC-3a: Traffic Safety on Carmel Valley Road**. This impact issue was originally TC-3 Traffic Safety in the Draft EIR/EIS and included traffic on Carmel Valley Road and San Clemente Drive. In the Draft EIR/EIS, Impact Issue TC-3 applied to all of the alternatives. Because of concerns expressed by residents on San Clemente Drive, the Impact Issue has been divided into two subsections. Impact Issue TC-3a addresses traffic safety on Carmel Valley Road, and the impact determination of is short-term less than significant is unchanged from the Draft EIR/EIS. There would be no traffic related impacts associated with the No Project Alternative.

- **TC-3b: Traffic Safety San Clemente Drive**. Impact Issue TC-3b addresses addresses traffic safety on San Clemente Drive. For the Proponent's Proposed Project, mobilization and demobilization of construction equipment using San Clemente Drive are expected to occur over a period of several weeks and involve 15 to 30 trips with heavy equipment. Thereafter, 5 to 10 trips per day would occur on San Clemente Drive for worker, supervisor and maintenance access over a period of up to eight months during the construction of the Tularcitos Access Road. For Alternatives 1, 2, and 3, San Clemente Drive would be needed to provide access below the Dam, which is not accessible from the Chachagua Access Route. It is anticipated that less than 25 percent of the total construction traffic would use San Clemente Drive for access below the Dam under these alternatives. Under Alternatives 1, 2, and 3, the number of trips added to San Clemente Drive is not projected to exceed 12 trips per day. Because of the rural nature of the area, the increase in the amount of traffic on San Clemente Drive would be short-term significant and unavoidable for all of the action alternatives. There would be no traffic related impacts associated with the No Project Alternative.

- **TC-6: Neighborhood Quality of Life**. In the Draft EIR/EIS, impacts related to this issue did not apply to the Proponent's Proposed Project and Alternative 1 and were determined to be less than significant for Alternatives 2, 3, and 4. However, For the Proponent's Proposed Project, mobilization and demobilization of construction equipment using San Clemente Drive are expected to occur over a period of several weeks and involve 15 to 30 trips with heavy equipment. Thereafter, 5 to 10 trips per day would occur on San Clemente Drive for worker, supervisor and maintenance access over a period of up to eight months during the construction of the Tularcitos Access Road. For Alternatives 1, 2, and 3, San Clemente Drive would be needed to

provide access below the Dam, which is not accessible from the Chachagua Access Route. It is anticipated that less than 25 percent of the total construction traffic would use San Clemente Drive for access below the Dam under these alternatives. The number of trips added to San Clemente Drive is not projected to exceed 12 trips per day. Although San Clemente Drive would continue to operate at LOS A, based on neighborhood quality of life level of service thresholds, this increase in amount of traffic may be noticeable to the residents. Because of the rural nature of the area, any additional traffic on San Clemente Drive would be short-term, significant and unavoidable for all the action alternatives. There would be no traffic related impacts associated with the No Project Alternative.

- **TC-7: Pavement Loadings**. In the Draft EIR/EIS Impact Issue TC-7 was determined to be less than significant with mitigation under Alternative 4. Because there would be no traffic related impacts associated with the No Project Alternative, this Impact Issue no longer applies to this alternative.

Cultural Resources

All of the action alternatives could damage cultural resources through ground disturbance, vibration, accumulation of dirt, and unintended damage. The Proponent's Proposed Project and action alternatives would each alter or remove the historic SCD. All of the action alternatives would alter (notch) OCRD, which is also a historic resource. They would also affect the character and visual integrity of the SCD historic district. These changes would affect the environment and the visual integrity of the area and would be significant and unavoidable.

In response to comments received on the Draft EIR/EIS, the following change was made in the Final EIR/EIS in the determination of significant impacts under CEQA (the impact itself has not changed).

- **CR-4: Demolition or Alteration to Historic Properties**. Under Alternatives 1, 2, and 3, notching or demolition of the historic Dam and fish ladder would be significant and unavoidable impacts that could not be fully mitigated.

Aesthetics / Visual Resources

All of the action alternatives would affect the viewsheds of neighboring areas. Residences on hills east of Carmel Valley would be able to see the operation of construction equipment. Because of the amount of traffic on Carmel Valley Road this would not be significant. Residences near the CVFP and SCD would also see construction activities. Due to the location of these residences, dam operations and maintenance activities are routine features of the landscape and the additional construction work would not be significant. Views from the San Clemente Drive residences and to users of the Stone Cabin would also change in the short-term and are discussed more fully below.

In response to comments received on the Draft EIR/EIS, additional information is provided in this Final EIR/EIS which clarifies and amplifies the following determinations of significant impacts under CEQA. The effects would be short-term and mitigation measures were included in the Draft EIR/EIS. However, some of the effects may be above the level that is normally acceptable to local residential areas. Therefore even though the impact levels are substantially the same as they were in the Draft EIR/EIS, some of the impact determinations have been changed from less than significant or less than significant with mitigation to short-term, significant and unavoidable.

- **VQ-1: Residential Views on Hills East of Carmel Valley Road**. An error was corrected in Table 2.1: in the Draft EIR/EIS, the table indicated a less than significant impact for Issue VQ-1 under Alternative 1; however this issue does not apply to Alternative 1 because the Tularcitos Access Route would not be constructed under this alternative.

- **VQ-3: Changes to the Viewsheds from Residences in Sleepy Hollow Subdivision**. This issue was erroneously coded as "does not apply" to the Proponent's Proposed Project and to Alternative 1 in the Draft EIR/EIS. It does apply to both alternatives. For the Proponent's Proposed Project, it refers to the views of the concrete batch plant which residents say would be visible from two of the residences. Although it is uncertain whether it can be seen from these residences, because of the rural nature of the area, this impact would be a short-term, significant unavoidable; impact, with no mitigation available. The Impact Issue also applies to Alternative 1, but would be short-term, less than significant. As with Alternative 2 and 3 the issue describes views of construction equipment passing through the Subdivision during normal working hours during the construction period.

- **VQ-4: Changes to Viewsheds from the Stone Cabin**. This issue was added in response to comments received during review of the Draft EIR/EIS. It documents a short-term less than significant impact and a long-term beneficial impact under Alternatives 1, 2, and 3; and does not apply to the Proponent's Proposed Project and Alternative 4.

- **VQ-5: Changes to Viewsheds from the Jeep Trail**. This issue was added in response to comments received during review of the Draft EIR/EIS. A short-term, significant and unavoidable impact to those traveling on a short segment of the Jeep Trail would occur during the period of sediment disposal operations and revegetation and long-term less than significant with mitigation under Alternatives 1 and 2. It would not apply to the Proponent's Proposed Project or Alternatives 3 or 4.

Recreation

The Draft EIR/EIS addressed recreation in a general chapter on "other environmental effects." For the Final EIR/EIS, a new section has been created to address recreation in more detail, responding to comments raised in public review. The following issues are addressed in this section:

- **REC-1: Access to the Stone Cabin via the Jeep Trail**. This issue documents a change in design made in response to comments. The location of the Site 4R disposal site inadvertently blocked access to the Stone Cabin via the Jeep Trail. The proposed design for Site 4R in the Final EIR/EIS relocates the site slightly uphill to avoid this impact and provides a sediment conveyor overcrossing. Impact Issue REC-1 would be short-term, less than significant for Alternatives 1 and 2 and would not apply to the Proponent's Proposed Project or Alternatives 3 or 4.

- **REC-2: Disruption of Use of Jeep Trail to Stone Cabin**. Travel by recreational users on the Jeep Trail would be disrupted at various times during the period of construction for Alternatives 1, 2, and 3. This would be a short-term, significant, and unavoidable impact.

- **REC-3: Rerouting or Restoring the Carmel River Channel**. This issue documents the beneficial impacts of river restoration under Alternatives 1, 2, and 3.

- **REC-4: Deposition of Sediment on Site 4R**. This impact applies to the two alternatives that would use Site 4R (Alternatives 1 and 2) and would be short-term, significant unavoidable; long-term, less than significant with mitigation (site restoration).

Land Use

The Draft EIR/EIS addressed land use in a general chapter on "other environmental effects." For the Final EIR/EIS, a new section has been created to address land use in more detail, responding to comments raised in public review. None of the project alternatives would pose a long-term conflict with existing plans and policies.

A short-term, significant and unavoidable impact would occur for the alternatives that require the use of Site 4R (Alternatives 1 and 2), because existing park land would be used for sediment disposal. This impact would be reduced to less than significant in the long-term by revegetation.

Environmental Justice

None of the alternatives would have significant effects on environmental justice. No changes in the determination of significant impacts under CEQA were made based on comments received on the Draft EIR/EIS.

2.4 AREAS OF KNOWN CONTROVERSY AND ISSUES TO BE RESOLVED

The Proponent's Proposed Project and action alternatives address all areas of known controversy. During the CEQA process, the issues of fish passage, sediment management, and construction-related traffic became areas of controversy. The design of these alternatives is intended to resolve existing issues in these areas.

Previous areas of known controversy and issues to be resolved that led to the Proponent's Proposed Project and culminated in the previous CEQA process are described in Section 1.6, Project History. The initial issue to be resolved concerned dam safety (ability to withstand the MCE and PMF). From 1980 to 1992, several investigations were conducted leading to the conclusion that the Dam would not withstand the MCE or PMF. The DWR/DSOD directed CAW to proceed with a project that would remove dam safety deficiencies, which led to the preparation of the original CEQA EIR in 1998. This issue is addressed by the Proponent's Proposed Project and all action alternatives.

During the CEQA process, the issues of fish passage, sediment management, and construction-related traffic became areas of controversy. Fish passage issues are addressed by the proposed replacement of the fish ladder (Proponent's Proposed Project, Alternative 1) or removal of the Dam (Alternatives 2 and 3). For the alternatives that retain the Dam (Proponent's Proposed Project and Alternative 1) sediment management is addressed through sluicing or dredging (Proponent's Proposed Project and Alternative 1). The effects of sediment management, including sluicing operations under the Proponent's Proposed Project and Alternative 1 have been addressed in an updated SOMP (Appendix J) and in updates to Chapters 4.2 and 4.4 of this Final EIR/EIS. These updates respond to concerns raised by NMFS and others regarding impacts to steelhead, a listed species, that may result from proposed sluice gate operations, due to increased suspended sediment concentrations in the Carmel River below the Dam. Other concerns addressed were potential effects to steelhead survival, spawning, rearing, and migration and to adult fish due to fallback through the sluiceway and fish passage above the Dam. Even though all of the action alternatives would affect steelhead larvae and juveniles during construction, all of the action alternatives, including the Proponent's Proposed Project, improve conditions for steelhead from the baseline conditions.

Concerns were expressed that some of the action alternatives might adversely affect the CRLF, another listed species. However, with mitigation and enhancement activities, all of the action alternatives would maintain or improve the existing habitat for the CRLF.

Sediment disposal management issues are addressed either by offsite storage (Alternatives 1 and 2) by means of a conveyor belt or in place stabilization (Alternative 3) for the Dam removal alternatives. For Alternatives 1 and 2, the identified sediment disposal site is located on Regional Park lands and close to an historic residential cabin. While the disposal site could create a short-term adverse visual impact, the only current users close to the site are the users of Stone Cabin. After disposal is completed, the site would be restored and the access road would, at the discretion of the Regional Park District, either be returned to its original condition or left in its improved state. No transportation of sediment would be done using roads.

Construction traffic issues relate to air quality, noise, aesthetics, traffic circulation, and traffic safety. They are addressed by the development of access alternatives that

minimize construction traffic through existing neighborhoods. For the Proponent's Proposed Project, San Clemente Drive would be used for approximately eight months until the new Tularcitos Access Road is built which would bypass Sleepy Hollow Subdivision. Alternatives 1, 2, and 3 would use Cachagua Road and an improved Jeep Trail for most of the necessary construction work. San Clemente Drive would continue to be used about 25 percent of the time to reach areas that are not accessible from the Chachagua Access Route. Both access routes are located in rural areas that experience little traffic other than from the residents. For this reason, the Final EIR/EIS considers many of the traffic-related impacts unavoidable and significant. However, the impacts would be short-term (only during construction) and would often be temporary and intermittent. In addition, a number of mitigation measures would be included in all the action alternatives that are designed to control the extent, the timing and the adverse impacts of construction traffic.

2.5 SUMMARY OF SIGNIFICANT EFFECTS AND MEASURES OR ALTERNATIVES TO REDUCE OR AVOID EFFECTS

Significant, unavoidable effects of the San Clemente Dam Seismic Safety Project and the No Project Alternative are summarized in Section 5.1. Other significant effects were identified, but can be reduced to less than significant or avoided by the mitigation measures specified in this EIR/EIS. These are summarized below:

Geology & Soils

There is a risk of landslides or slope instability along access roads. This can be mitigated through BMPs relating to geotechnical design of the road improvements. Soil erosion may occur along access road improvements leading to sediment discharge into watercourses. This can be mitigated through implementation of the Storm Water Pollution and Prevention Plan (SWPPP) (preliminary draft in Appendix K).

Hydrology and Water Resources

Under the Proponent's Proposed Project and Alternative 1, the SOMP would be used to regulate downstream sediment releases. Neither of these alternatives would have significant and unavoidable effects on sediment flows, storage, composition, deposition, suspended sediments, channel geometry, or the 100-year flood elevation. Implementation of the SOMP and water quality BMPs included in the SWPPP (Appendix K) would reduce any impacts to levels less than significant.

Under Alternatives 2 and 3, sediments could be mobilized and transported by the Carmel River and San Clemente Creek as they move through their restored channels in the areas exposed by excavation and as they reestablish channels traversing the newly-excavated sediment wedge. This could increase sediment flux passing the SCD site, downstream sediment composition and sediment storage in the Carmel River, and the channel geometry and floodplains of the Carmel River.

Water Quality

Sluicing under the Proponent's Proposed Project and Alternative 1 would lead to increases in turbidity in the Carmel River below the Dam that would be short-term, significant and unavoidable. The SWPPP, referred to under Geology and Soils, would be implemented to mitigate potentially significant effects to water quality from many project-related construction activities. These activities include: sediment discharge to watercourses during road construction and improvement; increased turbidity caused by disturbance of streambeds; accidental spills and leaks of toxic substances; fine sediments and toxins in return water after stream diversions; increased temperature and turbidity and decreased dissolved oxygen in water discharged from settling basins; and increased turbidity and release of toxic substances during construction of the OCRD notching and OCRB improvements and SCD construction or demolition. In addition, energy dissipation structures would be used to mitigate localized scour, sedimentation and turbidity when returning bypassed flows from stream diversions. Pipeline design, monitoring, filtering and mixing cooler, cleaner water would mitigate increased turbidity, decreased dissolved oxygen, and increased temperatures from dewatering the reservoir and carrying flows from stream diversions to the downstream river.

Fisheries

Construction related impacts occur for the Proponent's Proposed Project and the alternatives relating to impairment of upstream migration and effects from road and bridge construction on steelhead habitat in the Carmel River. Dewatering upstream channels, the reservoir and the plunge pool would cause short-term, unavoidable loss of fish and fish habitat for each construction season. These would be mitigated by annual fish rescues and relocation. Mitigation also includes water quality protection measures, stream channel restoration or recontouring, limits on tree and limb removal, measures to preclude roadfill from entering streams, streamside revegetation, and erosion control measures. Impacts to upstream fish passage would be mitigated by the construction of an improved fish ladder under the Proponent's Proposed Project and Alternative 1. Stream diversions under Alternatives 1, 2, and 3 would be mitigated by limiting the timing and amount of diversions in the Carmel River, and by an operations plan to provide flows for steelhead. Impacts associated with sediment removal and new river channels would be mitigated for Alternatives 1, 2, and 3 by river channel reconstruction and riparian revegetation.

Vegetation and Wildlife

Avoiding populations of CNPS List 4 species would mitigate the loss of special-status plant species under the Proponent's Proposed Project and all alternatives. Oak woodland would be avoided or mitigated through fencing and the implementation of a Revegetation Plan that provides for 3:1 replacement, plantings, monitoring, conservation easements, irrigation, and protection from browsing. Loss of other native vegetation would be mitigated by designing facility and access footprints to minimize loss; fencing; diffusing project outflows to minimize erosion; applying supplemental irrigation; and implementing a Revegetation Plan. Indirect effects to native vegetation

would be mitigated by BMPs for erosion control (SWPPP, Appendix K); minimizing changes to existing drainage patterns; avoiding work within tree driplines; dust control; revegetation; and monitoring.

Effects on special-status wildlife and their habitat would be mitigated through preconstruction surveys, rescue and relocation operations, predator control, CRLF habitat enhancement, and the development of other measures through consultation based on the results of surveys (details provided in preliminary draft of the Protection Measures for Special-status Species, Appendix V). Bat roosts, hawk nests, and woodrat nests would be avoided. Short-term barriers would be installed to prevent relocated species from reentering work areas. Biological monitoring would be conducted to allow for adaptive management of mitigation measures. Restrictions on vegetation clearing practices would protect vulnerable amphibians.

Wetlands

Impacts from the Proponent's Proposed Project and Alternatives 1, 2, and 3 to wetlands and other waters of the U.S. would be mitigated by the implementation of a Restoration, Mitigation & Monitoring Plan (Appendix U). Wetlands similar in function would be restored at a 3:1 ratio. Conservation easements on similar, unaffected and fully functional wetlands would be undertaken at a 3:1 ratio. Other waters would be restored or conserved at a 3:1 ratio. Cofferdams would be mitigated by criteria regulating their timing of placement and construction. The plunge pool staging area would be protected by construction BMPs and replacement plantings would be undertaken at a 3:1 ratio.

Air Quality

Construction or demolition activities at the dam site would generate fugitive dust (PM_{10F}), as would access road improvements and project-related traffic. These impacts would be mitigated by a variety of BMPs for dust suppression, such as watering, chemical stabilization and the provision of a point of contact for local residents to obtain corrective action when dust impacts occur.

Noise

Access road improvements and project-generated traffic would increase noise levels above acceptable levels at sensitive receptors located along access routes and in the Sleepy Hollow neighborhood. These impacts would be mitigated by using quiet-design construction equipment, mufflers, and enclosures; eliminating unnecessary idling; equipment maintenance and lubrication; timing restrictions for equipment use; low speed limits; and restrictions on timing of worker travel and truck deliveries.

Traffic

The Proponent's Proposed Project and all alternatives would add a significant level of traffic to the area road network. This would be mitigated by development of a Construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety, and a Traffic Coordination and Communication

Plan that includes traffic coordination, trip reduction, and traffic safety, flagging, and the escort of transport trucks. The Traffic Coordination and Communication Plan would include procedures for distributing the schedule of construction activities to the other users of the Jeep Trail. Procedures would be included in the Plan that would minimize the delay to non-project related Jeep Trail users during construction of improvements to the road as well as during subsequent project activities. Increased traffic also increases the potential for an increase in accidents. Additional mitigation would include funding additional enforcement and widening Cachagua Road (Alternatives 1, 2, and 3). Potential impacts due to inadequate corner site distances would be mitigated by improvements constructed at the affected intersections. Repairing damage to affected roads immediately after construction is completed would mitigate project-related traffic effects on pavement.

Cultural Resources

Ground disturbance that could affect archaeological resources would be avoided by construction monitoring, or mitigated by archeological evaluation or historical documentation. Unavoidable impacts due to demolition or alteration of historic structures and the character and visual integrity of their setting would be reduced by documentation, preparation of a Historic Preservation Management Plan, Historic American Building Survey/Historic American Engineering Record (HABS/HAER) recordation, interpretive displays, educational programs, photographic documentation, and use of compatible design, materials, and construction methods.

Visual Resources (Aesthetics)

Visual effects would be largely short term and less than significant without mitigation. Short term significant effects to travelers on the Jeep Trail would be caused by sediment disposal at Site 4R. These effects would be partly mitigated by screening and, in the longer term, by revegetation. Short-term significant effects would also be experienced by residences in the Sleepy Hollow subdivision. There is no mitigation for these effects although mitigation for traffic impacts would coordinate traffic activity to reduce circulation and limit these impacts to daytime use.

Land Use

Conflicts with existing plans and policies of Monterey County would be avoided by consultation with Monterey County during project permitting. Although use of Site 4R for sediment disposal has been moved so that it does not block access to the Stone Cabin, there would still be some short-term significant and unavoidable impacts to the MPRPD due to use of the Jeep Trail during the construction period by Alternatives 1, 2, and 3. These short-term impacts would be reduced by consultation with the MPRPD. There are no long-term impacts. Following construction, the road would be restored to its pre-project condition or left in its improved condition based on consultation with MPRPD

Recreation

Short-term significant and unavoidable effects due to disruption of recreational access via the Jeep Trail would be partly mitigated by restricting the times of operation for heavy equipment. Short-term significant and unavoidable effects due to deposition of sediment at Site 4R would be mitigated by restoration of the site.

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CHAPTER 3.0

DESCRIPTION OF THE ALTERNATIVES

3.0 DESCRIPTION OF THE ALTERNATIVES

3.1 OVERVIEW

3.1.1 SUMMARY OF PROJECT/ACTION ALTERNATIVES

No "preferred alternative" has been designated by the Lead Agencies. The Proponent's Proposed Project is dam strengthening with in-place sediment stabilization (under the National Environmental Policy Act (NEPA), this is termed the "proposed action"). The following alternatives to the Proponent's Proposed Project were considered in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS):

- Alternative 1 Dam notching with partial sediment removal
- Alternative 2 Dam removal with total sediment removal
- Alternative 3 Carmel River reroute and dam removal with in-place sediment stabilization
- Alternative 4 No Project

These alternatives are summarized in Chapter 2 and described in detail below. The Proponent's Proposed Project and alternatives include site access, sediment removal and disposal, fish passage, and water diversion. The project and its alternatives meet the requirement of increasing the safety of San Clemente Dam (SCD) to meet design criteria for withstanding a Maximum Credible Earthquake (MCE) and passing a Probable Maximum Flood (PMF).

Table 3.1-1 presents a summary of the comparative costs of the Proponent's Proposed Project and action alternatives. The table includes construction as well as operation and maintenance costs. These totals include escalation, engineering, management, administrative, mitigation and permitting costs; they do not include financing costs. Costs are escalated to the year 2009 at 12 percent per year, except in the case of Alternative 2, which will require an additional year for construction and is escalated to 2010. These costs are preliminary and are expected to change.

The California American Water Company (CAW) is currently exploring funding strategies for the action alternatives. In general, CAW would seek approval from the California Public Utilities Commission (CPUC) for recovery through water sales revenues of the cost of any project it must carry out to meet regulatory requirements. However, the CPUC will not rule on which costs may be included in the rate base until such a rate hearing occurs.

Table 3.1-1: San Clemente Dam Seismic Safety Project Alternative Cost Comparison Table

Cost Breakdown	Proponent's Proposed Project Dam thickening	Alternative 1 Dam Notching	Alternative 2 Dam Removal	Alternative 3 Carmel River Bypass and Dam Removal
Construction Field Costs	$19,477,000	$37,259,000	$43,775,000	$31,192,000
Operation & Maintenance Costs	$1,000,000	$1,200,000	$ 200,000	$200,000
Subtotal Cost	$20,477,000	$38,459,000	$43,975,000	$31,392,000
Cost + 25% Contingency	$25,596,000	$48,738,500	$56,076,000	$39,240,000
Construction Cost + 25% Contingency and Escalation	$35,960,537	$68,474,083	$88,236,672	$55,129,375
Implementation Cost	$13,000,000	$27,000,000	$30,000,000	$20,000,000
Total Cost	$49,000,000	$95,000,000	$118,000,000	$75,000,000

Notes:

1 Financing costs are not included.

2 Total costs are rounded to the nearest $1,000,000.

3 Construction costs are escalated at 12 percent to 2009 $ for all alternatives except Alternative 2, where the total cost is escalated to 2010 $. Source: California Department of Transportation (Caltrans) Highway Construction Cost Index, 2nd Quarter, 2006

4 Implementation costs include engineering, management, administrative, mitigation, and permitting costs.

No other feasible funding source or strategy for the dam notching (Alternative 1) or dam removal (Alternative 2) has been identified to date. For the Carmel River reroute (Alternative 3), the State of California has indicated a preliminary interest in funding the project under a scenario in which CAW would turn over the project and property surrounding the Dam to the California Coastal Conservancy, plus contribute a share of the funding.

Access Alternatives

An evaluation of the possible access routes for project construction was conducted and the results are summarized below in Table 3.1-2 which presents the use of various access routes by alternative, and the level of improvements planned.

For the Proponent's Proposed Project (Dam Strengthening), the Tularcitos Access Route was selected. For Alternative 1 (Dam Notching), Alternative 2 (Dam Removal), and Alternative 3 (Carmel River Reroute and Dam Removal), the Cachagua Access Route would be the primary route providing access above the Dam, to mobilize equipment, excavate sediment, and move sediment to disposal areas.

The Proponent's Proposed Project would use the section of San Clemente Drive from Carmel Valley Road through Sleepy Hollow (to the point where it intersects with the new Tularcitos Access Route) only until the Tularcitos Access Route is complete (approximately eight months during CY 3). It would also use the section of San Clemente Drive from the Tularcitos Access point for access to the Dam.

Table 3.1-2: Access Routes Used by Alternative

Roadway	Proponent's Proposed Project	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Carmel Valley Road	minor improvement, major arterial serving all access routes	minor improvement, major arterial serving all access routes	minor improvement, major arterial serving all access routes	minor improvement, major arterial serving all access routes	no improvements, existing levels of use
San Clemente Drive	minor improvements for initial access until Tularcitos completed (approximately two months of CY 3)	minor improvements for secondary access below dam, mobilization, demobilization	minor improvements for secondary access below dam, mobilization, demobilization	minor improvements for secondary access below dam, mobilization, demobilization	no improvements, existing levels of use
Tularcitos Road	new permanent road, primary access				
Cachagua Road (part of Cachagua access route)		permanent improvement, primary access	permanent improvement, primary access	permanent improvement, primary access	no improvements, existing levels of use
Jeep Trail (part of Cachagua access route)		substantial permanent improvements, primary access	substantial permanent improvements, primary access	substantial permanent improvements, primary access	
Road from Jeep Trail to Reservoir & Dam (part of Cachagua access route)		new temporary road, primary access	new temporary road, primary access	new temporary road, primary access	

Alternatives 1, 2, and 3 would use San Clemente Drive from Carmel Valley Road through Sleepy Hollow to reach areas below the Dam which would not be accessible from the Cachagua route. These alternatives will use San Clemente Drive for initial mobilization of equipment needed below the Dam at the beginning of the project and demobilization of this equipment at the end of the project. San Clemente Drive would also be used to provide access below the Dam for construction workers, and occasionally during the project for trucks carrying supplies or equipment. This access route was selected over the Tularcitos Access Route for these alternatives to avoid potential impacts on terrestrial biology. More than 75 percent of the traffic associated with these alternatives is associated with work above the Dam (e.g., construction of the reroute, sediment removal, and dam removal). Periods of mobilization and demobilization using the San Clemente Drive route are expected to occur over a period of several weeks and involve 15-30 trips with heavy equipment during that period. The access routes are described briefly below:

San Clemente Drive Access Route

This access route following San Clemente Drive through Sleepy Hollow was originally proposed and analyzed in the 2000 RDEIR (Denise Duffy & Associates 2000). This existing access route includes San Clemente Drive from Carmel Valley Road through the Sleepy Hollow Community, plus the unimproved High Road and Low Road to the top of the Dam, the unimproved plunge pool road to the base of the Dam, and other unimproved roads serving existing CAW facilities such as the Carmel Valley Filter Plant (CVFP). Minor improvements will be made to San Clemente Drive to accommodate the planned use of this route as described above.

Tularcitos Access Route

This route was also briefly analyzed as a CEQA Alternative in the 2000 RDEIR (Denise Duffy & Associates 2000). This route includes most of the route of the Proposed Project access, but diverges south of the houses on San Clemente Drive and would intersect Carmel Valley Road approximately 750 feet west of San Clemente Drive. This route also includes construction of a new crossing of Tularcitos Creek via a steel truss bridge with a span of approximately 200 feet, with a wood deck and concrete abutments.

Cachagua Access Route

This access route follows Cachagua Road from Carmel Valley Road to an existing 4WD road (the "Jeep Trail") leading to sediment disposal Site 4R. The sediment site is accessed via a conveyor belt system from San Clemente Reservoir. A new temporary road would be built to connect the Jeep Trail to the reservoir and dam.

3.1.2 ALTERNATIVES CONSIDERED AND ELIMINATED

Dam Alternatives

Dam Strengthening

A 1997 *Design Memorandum on Structural Improvements for San Clemente Dam* (SCD) by Woodward Clyde Consultants (WCC) described a number of alternatives for dam strengthening. WCC eliminated some of these and others were evaluated and eliminated in the previous California Environmental Quality Act (CEQA) process. These alternatives and the reasons for eliminating them are:

POST-TENSIONED TENDONS

Installation of 8 post-tensioned tendons spanning horizontally between the abutments and bearing against the upstream face of the Dam. This alternative would require draining the reservoir every 5 years to test the long-term pre-stressed load in each tendon. The test would entail essentially the same procedures and equipment used to initially tension the tendons and would be expensive. This complex concept was eliminated due to serious construction, cost, and maintenance issues.

ARCH BEAMS

Construction of reinforced concrete beams on the downstream face of the Dam to provide partial support. The effect on reduction of stress during a MCE was minimal. This concept was eliminated as infeasible.

ARCH BEAMS WITH BUTTRESS SUPPORT

Construction of two horizontal arch beams supported by buttresses on the downstream face of the Dam. This concept was eliminated because it could impair fish ladder performance.

ARMORING

Armoring with shotcrete to increase dam stiffness and strength. This concept was eliminated because it would be ineffective in providing protection against the MCE and therefore would not meet project purpose and need.

ROLLER COMPACTED CONCRETE

Construction of a roller compacted concrete gravity section against the downstream face of the Dam. This alternative was eliminated due to significant environmental impacts due to encroachment into existing wetlands on the downstream side of the Dam (as compared to other dam strengthening alternatives that would not cause comparable impacts).

REMOVAL OF DAM SUPERSTRUCTURE

Removal of dam superstructure (including gates, piers, and walkways) to reduce dam stresses. This concept was eliminated because, although it would significantly reduce stress on the Dam, The Dam would still exceed acceptable stress levels and would require further notching to fully meet project purpose and need.

New San Clemente Reservoir

Construction of a new 23,000 to 29,000 acre feet (AF) reservoir that would inundate the existing dam and reservoir was proposed by Monterey Peninsula Water Management District (MPWMD). This concept was eliminated in February 1989 when State and Federal regulatory agencies rejected the MPWMD EIR/EIS as inadequate and indicated that the new reservoir may be infeasible due to extensive environmental impacts.

Dam Removal

An extensive review of dam removal literature was provided as part of the previous Recirculated Draft EIR (Denise Duffy & Associates 2000). The material in that Draft, as well as more recent work, was considered in preparing Alternatives 2 and 3, which would remove SCD.

Dam Removal through Notching and Localized Sediment Management

This concept was developed by the Institute for Fisheries Resources through an independent community process. Under this concept, the Dam would be notched, the area downstream of the Dam would be filled, and sediments behind the Dam would be dredged to construct a series of terraces stabilized with walls upstream and downstream of the Dam. A graded ramp would be constructed upstream of the Dam at a slope of approximately one percent until the old streambed is intersected. A graded ramp would be constructed downstream of the Dam at a slope of approximately 4 percent beginning at the Old Carmel River Dam (OCRD) until the profile reaches the level of the notched dam. Although the concept was intended to provide a stable, fish-friendly solution, it was eliminated due to engineering concerns about its stability and regulatory agency concerns that it would create multiple barriers to fish passage and would fill waters of the U.S. in the channel below the Dam.

Access Alternatives

As part of the SCD Seismic Safety Project EIR/EIS, a preliminary screening analysis was conducted for the potential major access routes to and from SCD. The purpose of the screening analysis was to choose one preferred access route to be used with each dam alternative described in the EIR/EIS. The preliminary access route screening analysis is provided as Appendix F to the EIR/EIS. Four potential major access routes were considered in the screening analysis: the Sleepy Hollow (now identified as the San Clemente Drive access) Route, the Sleepy Hollow Homeowners Association (SHHA) Proposed Route, the Tularcitos Route, and the Cachagua Route.

Based on the preliminary access route screening, all access routes that would entail the use of trucks to haul sediment from the reservoir were eliminated. A sediment site was selected that could be accessed by a conveyor belt system from the Dam. For the two alternatives that require sediment transport and disposal (Alternatives 1 and 2), the Cachagua route would be used to access the sediment site during site preparation and construction of the conveyor belt system.

For the Proponent's Proposed Project (Dam Strengthening), the Sleepy Hollow route was eliminated due to the potential impacts of truck traffic to a rural residential community, including safety concerns and impacts to pavement structure. The SHHA route was eliminated due to potential impacts to undisturbed riparian vegetation and habitat for sensitive species.

For access below the Dam under Alternative 1 (Dam Notching), Alternative 2 (Dam Removal), and Alternative 3 (Carmel River Reroute and Dam Removal), the Tularcitos Access Route was eliminated due to its greater biological impacts and because these alternatives used the Cachagua Access Route for a substantial part of the alternative's access needs.

A fifth access route called the Stone Pine Route was eliminated as a feasible option early in the environmental review process due to known environmental and physical constraints, including significant impacts to biological resources, a major river crossing, construction in a sensitive riparian habitat near listed species, higher costs, and regulatory uncertainty.

The eliminated access routes are described briefly below:

Sleepy Hollow Homeowner's Association (SHHA) Route

This access route alternative was proposed by the Sleepy Hollow Homeowner's Association and briefly analyzed as a CEQA Alternative in the 2000 RDEIR (Denise Duffy & Associates 2000). The route follows the Sleepy Hollow Route, diverging south of the residential area on San Clemente Drive and intersecting Carmel Valley Road approximately 3300 feet west of San Clemente Drive. This route also includes construction of a new crossing of the Carmel River.

Stonepine Access Route

This alternative was proposed to use the existing Stonepine neighborhood intersection with Carmel Valley Road at a point approximately two miles west of San Clemente Drive. This route would have required improvement of the existing Stonepine Bridge or the construction of a new bridge across the Carmel River and a roadway within an active floodplain.

Sediment Management Alternatives

A variety of alternatives have been considered to remove and dispose of sediment. Some were considered and eliminated earlier in the CEQA process and others were eliminated in an engineering screening and environmental constraints analysis done for the EIR/EIS. San Clemente Reservoir has been estimated to contain approximately 2.5 million cubic yards of sediment (Mussetter Engineering, Inc. [MEI] 2003). Montgomery, Watson and Harza (MWH) performed an engineering screening analysis of potential sediment disposal sites (Appendix G, Screening of Sediment Disposal Sites) and ENTRIX performed an environmental constraints analysis of the sites identified by MWH. The purpose of the screening analyses was to recommend selection of potential sediment disposal site(s) for use with Alternatives 1 and 2 (Dam Notching and Dam Removal). The required sediment disposal capacity for the Dam removal Alternative is approximately 2.5 million cubic yards. For the Dam notching Alternative, the estimated volume of sediment to be removed is approximately 1.5 million cubic yards (MEI 2005). The sediment transport and disposal Alternatives are described and the results of engineering screening are presented in Appendix G. The results of the environmental constraints analysis for the sediment transport and disposal Alternatives are presented in Appendix H. Those alternatives that were considered and eliminated are briefly summarized below.

Removal and Conveyance of Sediment

EXCAVATION AND CONVEYANCE BY SLURRY PIPELINE TO SEDIMENT DISPOSAL SITE

This conveyance alternative was eliminated due to the consumption of water that would have been required (as compared to the conveyor belt alternative, which would not consume water).

EXCAVATION AND CONVEYANCE BY TRUCK TO SEDIMENT DISPOSAL SITE

This conveyance alternative was eliminated due to large potential impacts to roads and bridges, traffic, safety, and residential communities along the truck haul route.

CONVEYANCE OF SEDIMENT IN NATURAL STREAM CHANNEL TO OCEAN

The previous CEQA process considered alternatives that allow uncontrolled release of the accumulated sediment in the reservoir for conveyance in the natural stream channel to the ocean. This alternative was eliminated due to significant and unavoidable downstream potential stream impacts to fish, aquatic habitat, floodplains and flooding; potential effects of sedimentation in the Carmel River estuary; and potential marine impacts to Monterey Bay National Marine Sanctuary.

Disposal of Sediment

DISPOSAL IN LANDFILL

Three landfill sites were considered and eliminated during the engineering and environmental screening. Sites 1 and 2A were paired to provide the full capacity required to process all of the sediment contained in the reservoir. These sites were eliminated because their capacities would have only marginally accommodated the required sediment volume, they impact known cultural resources, and they have incompatible neighboring land uses and visual impacts. Site 6R required a relatively long sediment haul route traversing residential areas and Carmel Valley Road. This alternative was eliminated due to traffic and safety impacts caused by truck haul, or the greater energy or water consumption required for the slurry pipeline or conveyor belt sediment conveyance.

OTHER SITES PREVIOUSLY IDENTIFIED

Other potential sediment disposal sites identified in a previous mapping study (California Department of Water Resources [DWR] 2002) include those referred to as Sites 2B through 2E, 3 and 5. These sites were only briefly considered and dismissed from further evaluation for purposes of the screening study. Sites 2B through 2E are small and of limited (and insufficient) capacity. Site 3 is located on a box canyon upstream of the Dam and is thus somewhat comparable to Site 4R. However, Site 3 is much farther from the reservoir and at a much higher elevation than Site 4R. Therefore, other factors being equal, disposal of sediment at Site 3 would be significantly more

costly than at Site 4R. Lastly, Site 5 consists of a steep slope overlooking Carmel River and appears to be unsuitable for sediment storage.

STAGING AND EXPORT FOR SALE

MWH conducted an investigation of the commercial value of sediment in San Clemente reservoir (Appendix I). The study concluded that cost-effective development of mineral resources in the sediment now stored in San Clemente Reservoir does not appear to be feasible at this time. While the sediment could be processed into products that have commercial value, this value is completely offset by the incremental processing and transportation costs involved. There is not a positive benefit-cost ratio for selling the sediment based on current market conditions.

Dam/Sediment Management Alternatives Considered During Previous CEQA Review

The RDEIR (Denise Duffy & Associates 2000), issued in 2000 considered nine combined dam/sediment management alternatives. However, the RDEIR did not compare the environmental impacts of these alternatives or provide reasons for eliminating them. Several of these alternatives have been carried forward in this EIR/EIS, which captures the range of alternatives without unnecessarily multiplying alternatives.

MITIGATED RETROFIT WITH SEDIMENT MANAGEMENT

This alternative combines the proposed dam thickening project with sediment management through the operation of two high-level sediment ports with sluice gates, management of sediment transport past the Dam and downstream, and spot dredging. This alternative is similar to the Proponent's Proposed Project considered in this EIR/EIS.

NOTCHING WITH DREDGING

Under this alternative the Dam superstructure would be removed and the Dam would be notched to an elevation of 506 feet and a lower fish ladder would be constructed. Sediments accumulated behind the Dam would be dredged to prevent uncontrolled downstream release. This alternative is essentially the same as Alternative 1 considered in this EIR/EIS.

NOTCHING WITHOUT DREDGING

This alternative is identical to the preceding alternative except that dredging would not be performed. This alternative has been eliminated due to the potential impacts from sedimentation, loss of channel stability, and flooding and impacts to fish habitat and the California red-legged frog (CRLF) associated with an uncontrolled release of sediment downstream.

NOTCHING WITH SEDIMENT MANAGEMENT AND SMALL RUBBLE DAMS

This alternative combines dam thickening (the Proponent's Proposed Project considered in this EIR/EIS) with sluice gates installed in two phases. Sediment accumulated behind the reservoir would be dredged, barged, and sluiced at double the throughput rate. The Dam would be notched to 506 feet and a lower fisher ladder would be constructed. A series of rubble dams would be installed between SCD and OCRD to provide grade control and fish passage. This alternative was considered and eliminated due to long-term significant adverse impacts to fish (over a 40-year period) before the design would provide stable fish passage and stream habitat.

DAM REMOVAL WITH DREDGING

This alternative involves dredging of accumulated sediments followed by removal of the Dam by breaching the spillway to an elevation of 457 feet. This alternative is essentially the same as Alternative 2 considered in this EIR/EIS.

PHASED DAM REMOVAL WITHOUT DREDGING

This alternative is identical to the preceding alternative except that dredging would not be performed. This alternative was eliminated due to the potential impacts from sedimentation, loss of channel stability, flooding and impacts to fish habitat and the CRLF associated with an uncontrolled release of sediment downstream.

COMPREHENSIVE DAM REMOVAL WITH SEDIMENT MANAGEMENT

This alternative provides a phased approach to dam notching, culminating in dam removal. Sluice gates would be installed and operated prior to each increment of dam notching. Controlled sediment releases to the Carmel River below the Dam would occur over a 60 to 100 year period. When complete, this alternative would theoretically provide unimpeded fish passage, release bedload (including spawning gravel) from the upper watershed, and restore the river and canyon to its pre-dam conditions. However, this alternative would have substantial long-term impacts to water quality and fish for 60 to 100 or more years. Additionally, the ability to "control" releases was not demonstrated, and potential flooding impacts were also considered in eliminating this alternative.

DEMOLITION AND MINING

This alternative would remove the Dam immediately through demolition to its base at elevation 457 feet. An attempt would be made to mine the released sediment. It was considered doubtful that mining could keep pace with downstream transport of sediment. The sediment releases associated with this alternative could jeopardize the listed steelhead trout population in the river as well as CRLF; result in substantial channel aggradation and bank migration and significantly increase flood risk; and risk loss of property, public infrastructure, and human life. Therefore, this alternative was eliminated.

MITIGATED RETROFIT AND DREDGE TO RESTORE CAPACITY

This alternative considered dredging the reservoir to restore its water storage capacity while retrofitting the Dam for seismic and flood-safety. This alternative was considered and eliminated due to significant, unavoidable water quality, steelhead trout, and CRLF impacts associated with dredging, as well as traffic, noise and air quality impacts associated with sediment disposal.

Water Diversion Alternatives

Installation of Water Wells in the Russell Field Area

This alternative considered three 2,400-gpm wells installed to a depth of approximately 80 feet in the alluvial deposits in the Russell Field area. The wells would be equipped with vertical turbine pumps delivering water to CAW's filter plant with an elevation head equivalent to that provided by the reservoir (total lift of approximately 200 feet to El 525). The wells would discharge to a common 24-inch-diameter, 2,000-foot-long, steel pipeline that would connect to the existing treatment facilities in the vicinity of the CVFP. Well installation would include the stainless-steel screen and casing, a properly installed filter pack, concrete slab at the well head, manifold piping, and valving. The pumps would have 100-hp electrical motors energized from a nearby 12-kV power line. Motor starters, switchgear, instrumentation and controls would be included in the outdoor-type installation. This alternative was eliminated due to cost and operational considerations.

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3.2 PROPOSED PROJECT: DAM THICKENING

3.2.1 OVERVIEW

The Proponent's Proposed Project (or in NEPA terms, the proposed action) is to retrofit the existing SCD, which is owned and operated by the Coastal Division of the CAW. The proposed improvements are intended to comply with DWR, Division of Safety of Dams (DSOD) requirements to address safety deficiencies and guard against failure from an MCE, and a PMF event, which could erode dam abutments.

Engineering investigations have identified structural improvements described as "downstream dam thickening" as the most appropriate design option for strengthening the Dam. This approach was the preferred project alternative in a 1995 report prepared for CAW by WCC, entitled *Structural Improvement of San Clemente Dam, Preliminary Feasibility Study*. MWH reviewed and approved this approach in 2004 for this EIR/EIS. DSOD confirmed that the Dam thickening alternative is an acceptable design (July 1, 1998, letter) and approved the contract drawings and specifications for the retrofit in 2001.

3.2.2 PROJECT LOCATION

For the purposes of this Final EIR/EIS, the Proponent's Proposed Project study area and area of potential effect comprises the reservoir, dam, CVFP, access roads, and affected reaches of the Carmel River and San Clemente Creek. Figures 3.2-1 and 3.2-2 depict the project region and vicinity, respectively.

The Project Area is within the upper reaches of the Carmel River in an unincorporated area of Monterey County. SCD sits at the confluence of Carmel River and San Clemente Creek (River Mile [RM] 18.5), approximately 15 miles southeast of the City of Carmel-by-the-Sea and 3.7 miles southeast of the Carmel Valley Village. Approximately five miles upstream of the SCD, is Los Padres Dam (LPD) at RM 23.5 on the Carmel River. SCD impounds a reservoir and serves as a surface water diversion point from the Carmel River.

The Project Site and most of the land surrounding the reservoir are owned by CAW. Land adjacent to the reservoir is largely undeveloped, consisting of steep slopes covered with dense chaparral and oak woodland. The CVFP is 1.5 miles north of the Dam. Surface water from the reservoir is gravity-fed to the CVFP. The Sleepy Hollow subdivision is located on San Clemente Drive adjacent to Carmel Valley Road and consists of 23 estate-sized lots with 16 completed residences. The Sleepy Hollow Steelhead Rearing Facility (SHSRF), constructed and operated by the MPWMD on land owned by CAW, is located less than one mile downstream of the existing dam.

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Santa Cruz County
Santa Clara County
Merced County
San Benito County
Monterey County
Soquel
Santa Cruz
Aptos
Gilroy
Freedom
Watsonville
Hollister
San Juan Bautista
Moss Landing
Castroville
Marina
Salinas
Seaside
Monterey
Pebble Beach
Carmel-by-the-Sea
Carmel Valley
Carmel Highlands
Gonzales
Jamesburg
China Camp
Tassajara Hot Springs
Monterey Bay
Carmel Bay
Carmel River
Salinas River
Project Area
152
101
25
129
156
183
68
17
20
16
1
Oregon
Idaho
Nevada
California

Legend

City
Major Road
County Boundary
Lake/Reservoir
Major River

Projection: California State Plane, Zone IV
Datum: NAD 83 Units: Feet

San Clemente Dam EIS/EIR

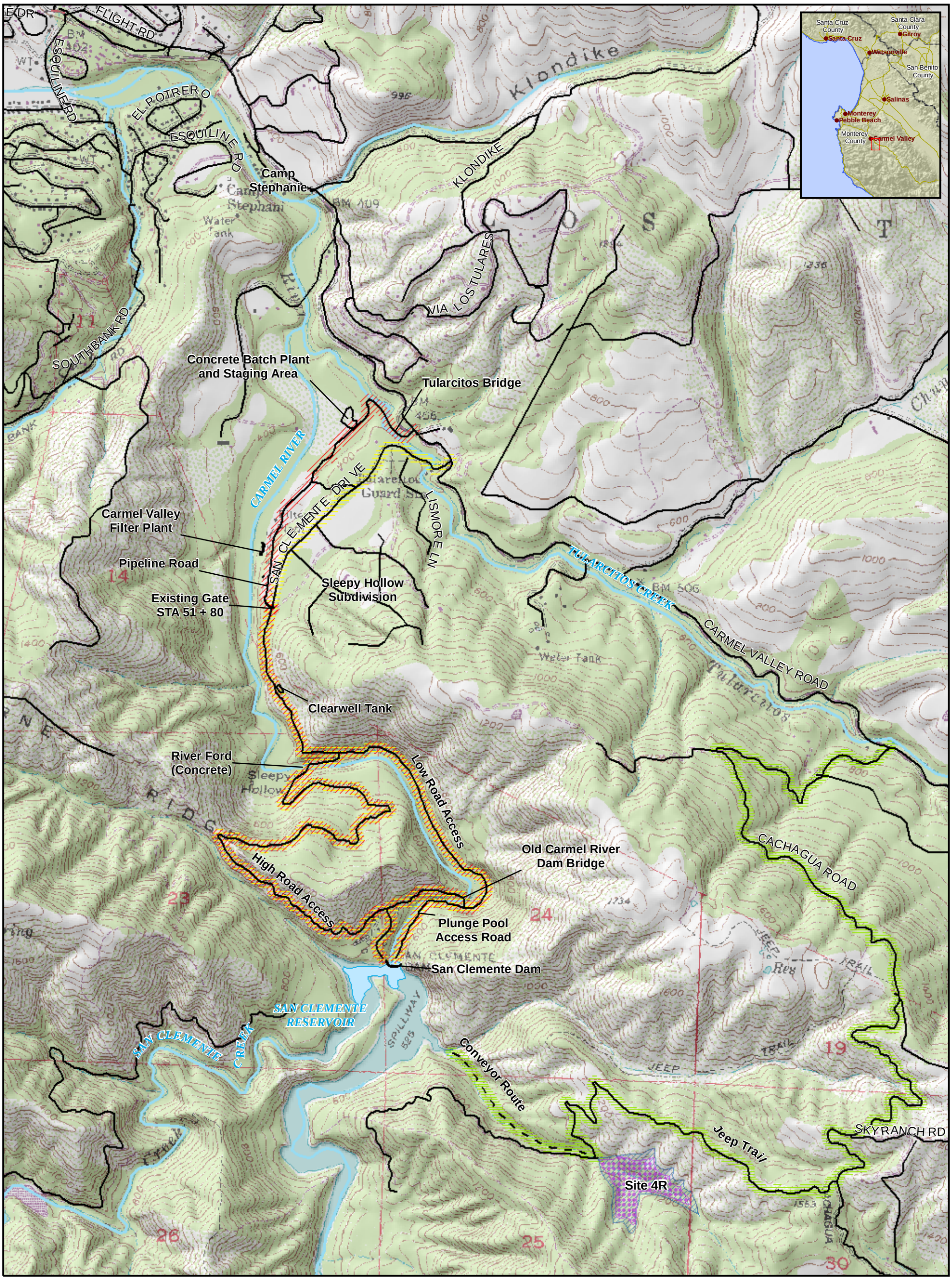
Figure 3.2-1

Project Site Location Map

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Miles

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Legend

Access Routes
- Cachugua / 4R
- Sleepy Hollow
- Tularcitos
- Sleepy Hollow / Tularcitos*

*Note: Sleepy Hollow and Tularcitos access routes share the same roads between the filter plant and the dam

- Stream
- Reservoir
- Existing Road
- Proposed Road

Sediment Disposal Site
- Alternative 1 (16 Acres)
- Alternative 2 (22 Acres)

Projection: California State Plane, Zone IV
Datum: NAD 83 Units: Feet

San Clemente Dam EIS/EIR

Figure 3.2-2

Local Vicinity Map

0 0.15 0.3 0.6
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3.2.3 EXISTING STRUCTURE & OPERATIONS

San Clemente Dam

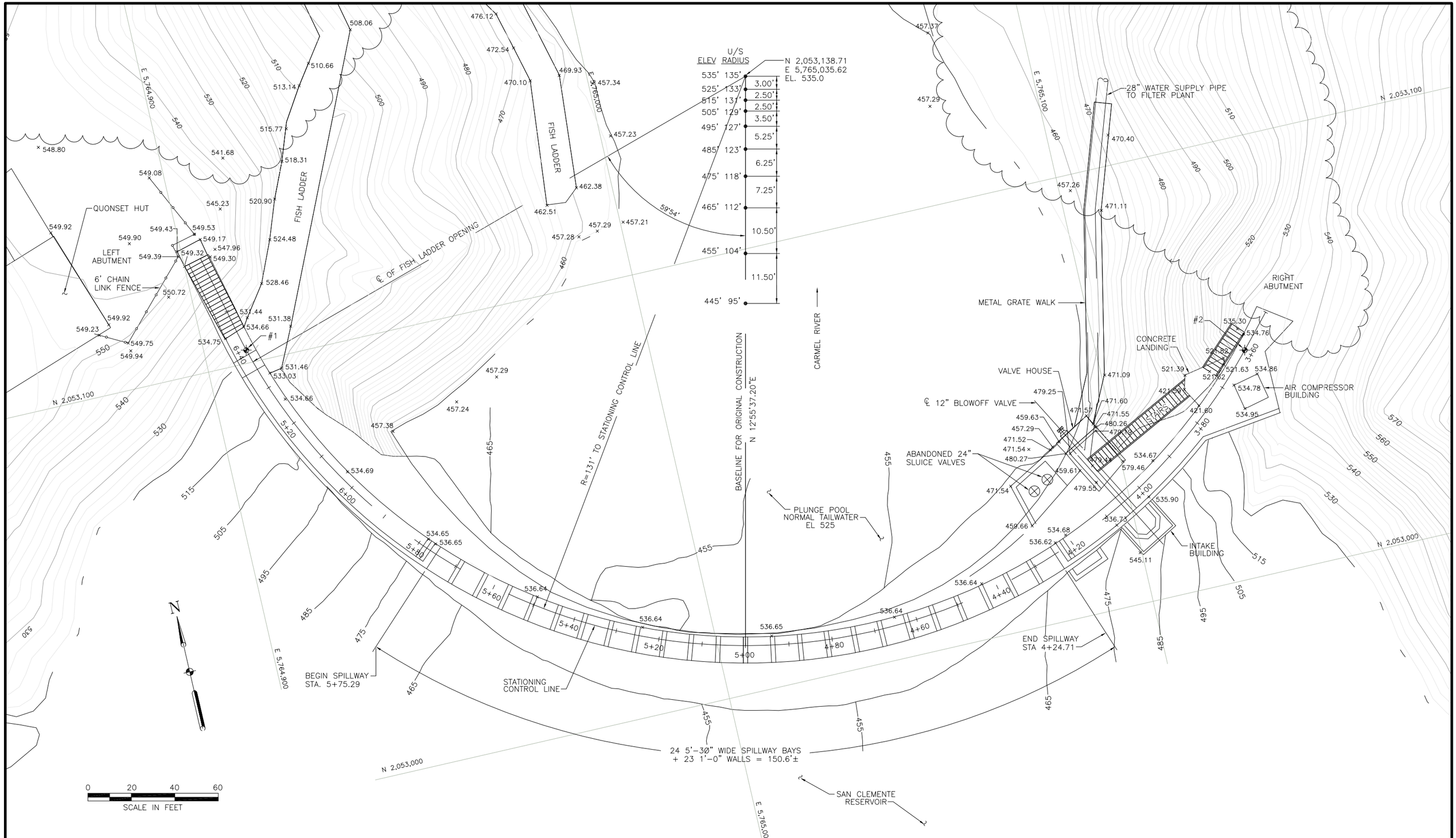
SCD is a concrete arch dam constructed in 1921, with a maximum structural height of 106 feet and a crest length of 300 feet. The reservoir impounded by SCD is currently used in conjunction with the Los Padres Reservoir and Upper Carmel Valley Aquifer wells as a source of water diversions to the CVFP. The reservoir and the CVFP are also an important water source for unincorporated Carmel Valley Village during the winter, although diversions are limited during low flow seasons. Currently, the reservoir serves as a point of diversion to serve the Peninsula and is operated to facilitate fish passage. A major portion of the Monterey distribution system relies upon the pressure head supplied by diversion from the reservoir, and many of the appurtenant system components (e.g., pumps, feed systems, etc.) were designed and installed accordingly.

Currently, CAW is limited to direct diversion of 1,137 AF at SCD based on the amount of water actually put to use by its predecessors prior to 1914. This is equivalent to a continuous direct diversion rate of 3.185 cubic feet per second (cfs) over a typical 180-day, six-month long dry season.

Pursuant to the 2001 Conservation Agreement between CAW and the National Marine Fisheries Service (NMFS), during low flow periods (defined as times when stream flow in the Carmel River at the Don Juan Bridge [RM 10.8] gage is less than 20 cfs for five consecutive days), CAW is required to cease surface diversions from SCD and to limit its production from wells in the Upper Carmel Valley Aquifer to maintenance levels, with no more than a combined instantaneous diversion of 0.5 cfs from the Russell wells. At these times, CAW maximizes production from its wells in the Lower Carmel Valley Aquifer and Seaside facilities. These requirements were added to State Water Resources Control Board (SWRCB) Order 95-10 in 2002 and are also referenced in the Annual Memorandum of Agreement (MOA) on Carmel River flows described under “Dam Construction Reservoir Drawdown and Stream Diversion” in this chapter. Refer to Section 1.5 of this Final EIR/EIS for a discussion of federal, state, and local regulatory requirements, including those of NMFS and the SWRCB.

The SCD crest is at Elevation 537 feet. (Figure 3.2-3 and 3.2-4) show the plan and profile of the existing dam. The spillway is an overpour structure with a crest elevation of 525 feet located at the center of the Dam. The original design storage capacity of the reservoir was 1,425 acre-feet at the spillway crest and 2,260 acre-feet at the top of the gates with the spillway gates in place. However, siltation has reduced the storage capacity of the reservoir to less than 150 acre-feet at the spillway crest, based on results of a survey conducted in March 2002 by CAW.

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SOURCE : Woodward-Clyde International (11/98)

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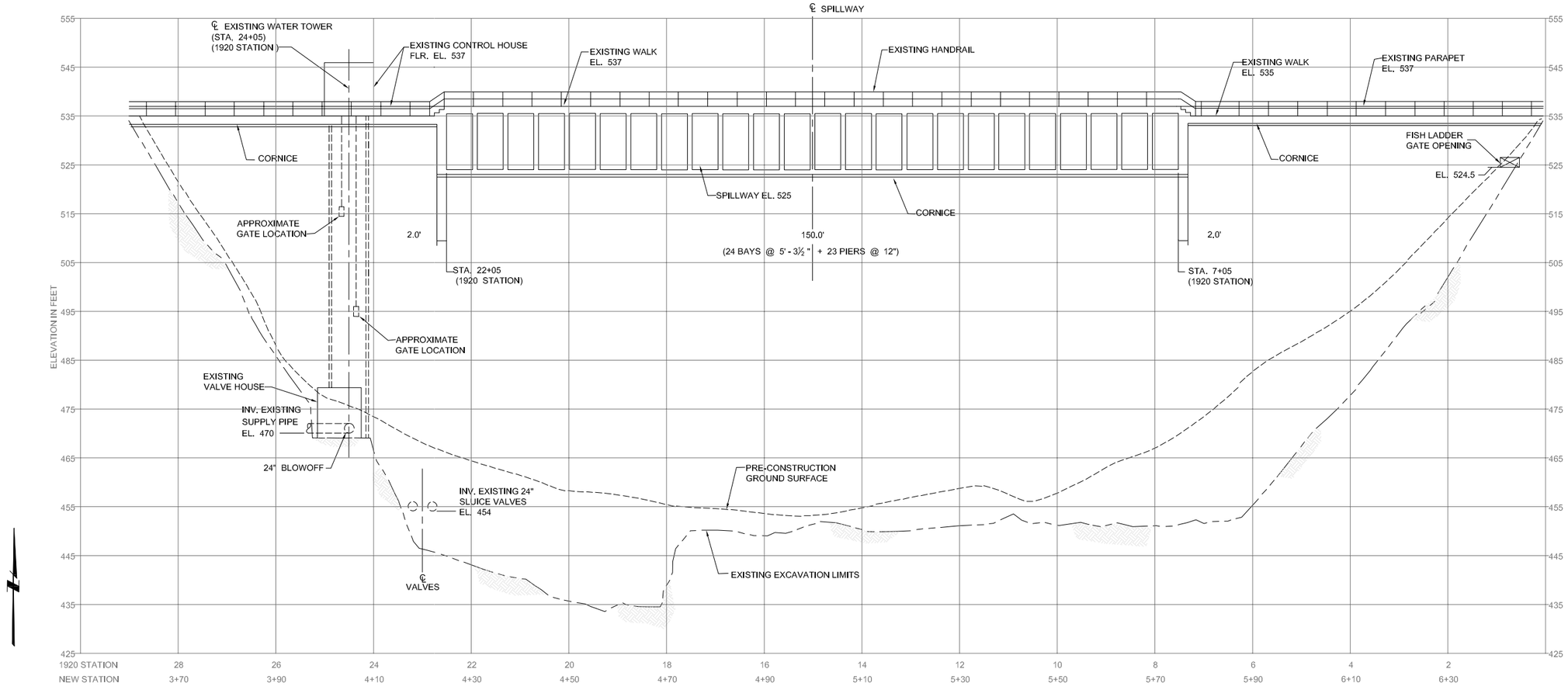
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California

CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
PLAN OF EXISTING DAM

Figure 3.2-3



PROFILE ALONG VERTICAL PROJECTION
OF DOWNSTREAM ARC OF EL. 535
(LOOKING UPSTREAM)

NOTES:

1. ALL INFORMATION WAS GENERATED FROM ORIGINAL DRAWINGS DATED AUGUST 31, 1920.

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SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
PROFILE OF EXISTING DAM

Figure 3.2-4

All spills since 1996 have occurred when the reservoir water level exceeds Elevation 525 feet. Operational restrictions are established annually via an MOA signed by California Department of Fish & Game (CDFG), MPWMD, and CAW (see Section 1.4).

Prior to 1996, the reservoir was operated without the spillway flashboards during the winter peak flood season (generally November 1 to April 30) and with flashboards in place during the spring, summer and into fall. The MPWMD was concerned that the shallow water levels occurring in the reservoir with the flashboards installed were responsible for elevating water temperatures in the Carmel River downstream of SCD and at the SHSRF. MPWMD requested that CAW control the reservoir without the spillway flashboards (MPWMD letter to CAW, April 22, 1997); flashboards have not been used at the Dam since 1996.

The outlet structure consists of a concrete outlet tower attached to the back end of the Dam with three intake gates at elevations of 515, 495, and 470 feet. The lower two gates cannot be operated due to buildup of sediment; water can be taken out from the highest gate. The upper gate has been fitted with a standpipe with an intake elevation of 522 feet to extend the intake above the current sediment level of about 515 feet surrounding the outlet tower. A valve house is located at the downstream toe of the Dam on the right abutment (looking downstream). The valve house contains a diversion structure that directs water to a conveyance pipe for treatment at the CVFP and to a low-level discharge pipe to the river. The eastern-most spillway bay (on the right side of the spillway looking downstream) is permanently closed to prevent damage to the valve house and appurtenant structures at the toe of the Dam during spilling. Two additional pipes extend through the Dam at approximately Elevation 454 feet, but the intakes to these pipes have been buried by sediment and are not operational.

In 2002, DSOD ordered modifications to SCD to meet interim dam safety requirements (see Section 3.6). These included installing six 12-inch valved ports in the Dam to draw down the reservoir to 515 feet during low flow periods.

Fish Ladder and Fishery Habitat

A fish ladder approximately 68 feet high is located on the west side of the Dam (left abutment), and provides passage for migrating steelhead between the plunge pool at the downstream base of the Dam and additional spawning habitat on Carmel River and San Clemente Creek upstream of the reservoir.

Carmel Valley Filter Plant

The CVFP is a surface water direct filtration and treatment facility operated by CAW, located approximately two miles downstream from the SCD on the east bank of the Carmel River. A 24-inch diameter diversion pipe parallel to the Carmel River delivers water from the reservoir to the CVFP. Access to the CVFP from Carmel Valley Road is via San Clemente Drive. No changes to the CVFP are proposed as part of this project.

3.2.4 PROJECT CHARACTERISTICS

This section describes the SCD Strengthening Project, including abutment protection, spillway and crest modifications, electrical system upgrades or improvements, and replacement of the fish ladder. Sediment accumulated behind the Dam would be left in place. It also summarizes construction activities necessary to complete the project and describes improvements to and/or new roads proposed as part of the project.

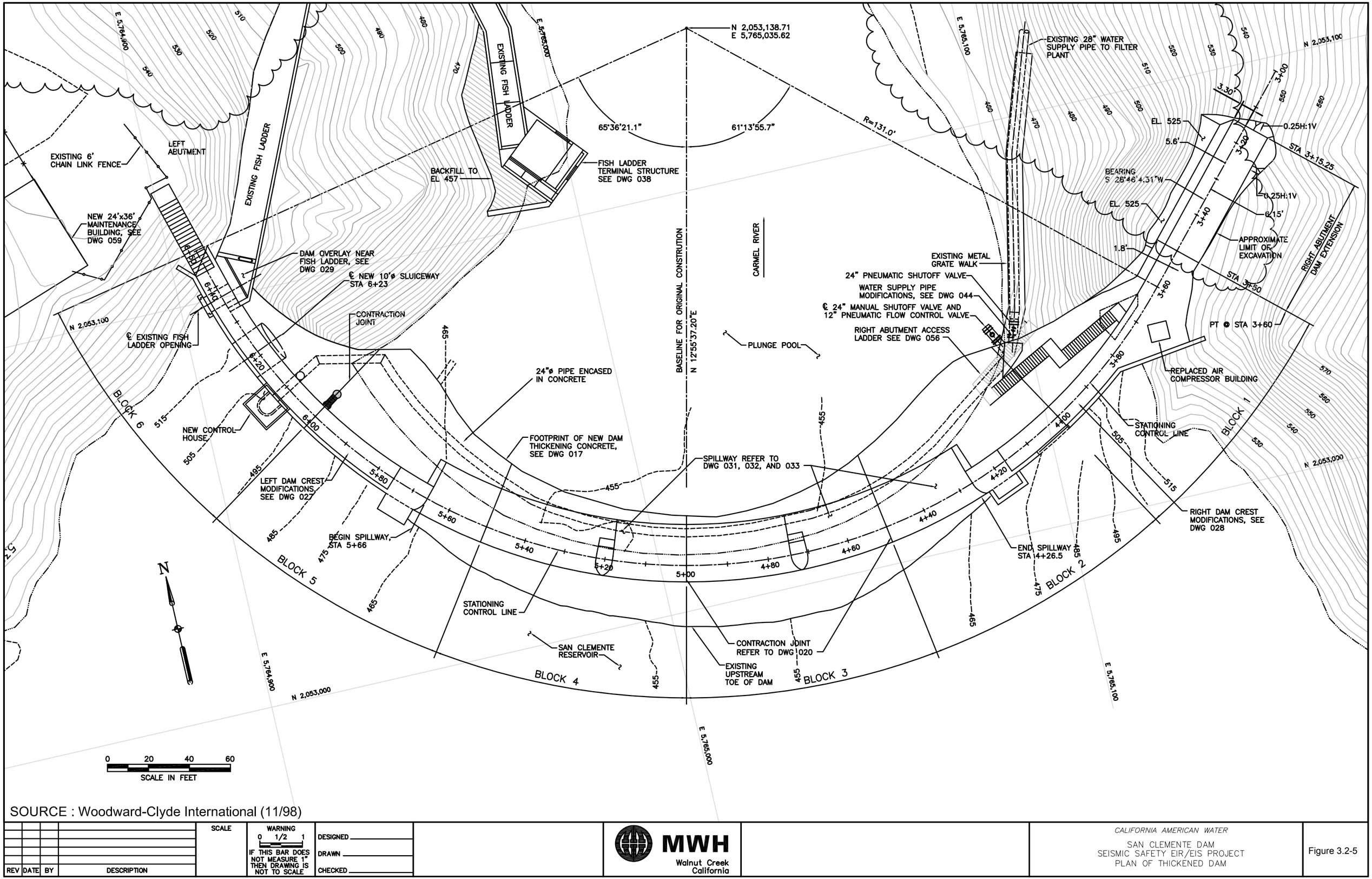
Dam Thickening

The proposed seismic retrofit project consists of thickening the Dam on the downstream side and providing abutment protection, particularly on the right abutment (as seen facing downstream). Figures 3.2-5 and 3.2-6 provide an overview of the Dam thickening plan and profile for the Proponent's Proposed Project. The Dam would be thickened by the placement of 50 to 60 cast-in-place concrete blocks, each approximately 50 feet in length and 10 feet in height, on the downstream face of the Dam. Each block would be tied to the existing dam structure with reinforced steel dowels. The thickness of the new concrete would be approximately proportional to the original thickness at each location along the Dam profile. For example, above Elevation 465 feet, the Dam would be thickened by 80 percent, ranging from 4.2 to 8.8 feet of concrete added; below Elevation 465 feet, 9 feet of concrete would be added. Figure 3.2-7 illustrates typical sections of the thickened dam.

Staging, Concrete Mix, and Production Plant

The project requires a concrete batch plant for concrete. The batch plant requires a level area approximately 5 acres (about 218,000 square feet) in size with good road access in order to move in/out the larger pieces of batch pant equipment and aggregate materials. The presence of mountainous terrain up the canyon area closer to the Dam, and narrow, winding access roads limits possible site locations for the batch plant to near Carmel Valley Road. A smaller site closer to the Dam, was considered, but it was determined to not be large enough to allow large trucks to turn around. Therefore, it is not feasible to locate the batch plant closer to the Dam. Additionally, the proximity of electric power lines avoids the need to use of diesel generators for batch plant operation. This avoids additional emissions of NO_X, CO, ROC, SO_2, and diesel fine particulate (PM_{10}).

A portable concrete batch plant is proposed as shown in Figure 3.2-8. The proposed location for the concrete batch plant is an approximately 5-acre site, located about 2,400 feet northeast of the existing CVFP. This level area of CAW property has been disturbed in the past and sufficient lay-down area is available at this location. In addition, eighteen-yard transfer trucks could off-load raw materials directly onto stockpiles for use in concrete production.



SOURCE : Woodward-Clyde International (11/98)

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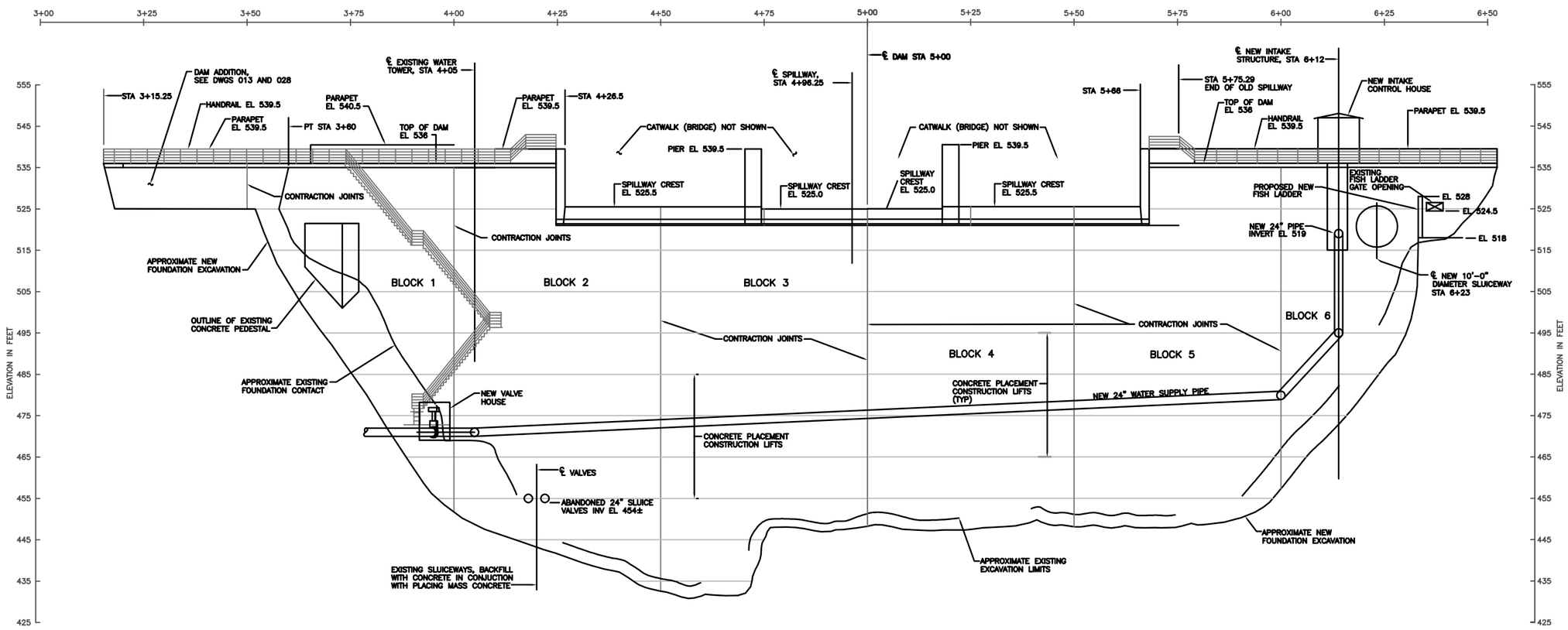
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SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
PLAN OF THICKENED DAM

Figure 3.2-5



DEVELOPED PROFILE ALONG THE DOWNSTREAM FACE OF NEW CONCRETE
(LOOKING UPSTREAM)

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NOTES:

1. CONTRACTION JOINTS SHALL HAVE 1-INCH CHAMFERS ON THE DOWNSTREAM FACE.
2. IF THE MAXIMUM HEIGHT OF A CONSTRUCTION LIFT PLACED AGAINST THE FOUNDATION IS LESS THAN 2-FEET, OR IF THE VOLUME OF CONCRETE IN THE LIFT IS LESS THAN 5-YARDS, INCLUDE THAT LIFT PLACEMENT WITH THE NEXT VERTICAL LIFT.

SOURCE : Woodward-Clyde International (11/98)

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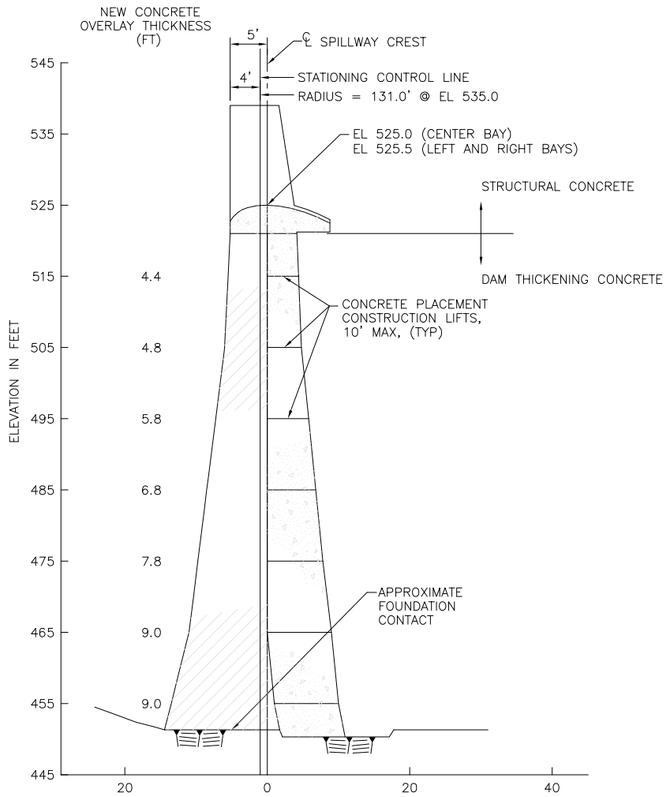
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CALIFORNIA AMERICAN WATER
SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
PROFILE OF THICKENED DAM

Figure 3.2-6

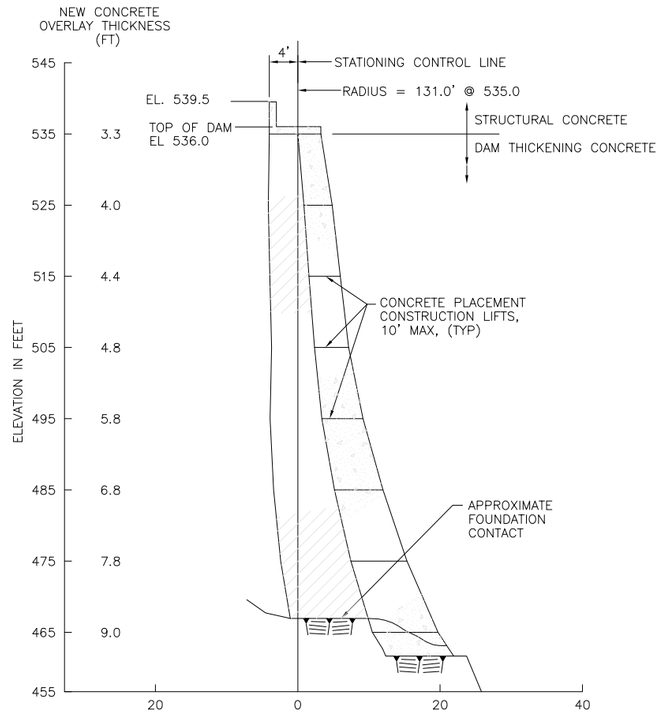


TYPICAL SPILLWAY SECTION

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TYPICAL NON-SPILLWAY SECTION

STA 6+00

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SCALE IN FEET

NOTES:

1. REFER TO TABLE ON DWG 014 FOR OVERALL DAM GEOMETRY. LAY OUT NEW CONCRETE OVERLAY BASED ON THICKNESS CALLED OUT ON TYPICAL SECTIONS. IN THE EVENT THE ACTUAL RADII OF THE DOWNSTREAM FACE OF THE OVERLAY VARIES FROM THE SPECIFIED RADII ON DWG 014 BY MORE THAN SIX INCHES, NOTIFY ENGINEER BEFORE CONCRETE PLACEMENT.
2. FORM CONCRETE LIFTS WITH VERTICAL CHORDS NO GREATER THAN LIFT HEIGHT.
3. FORM CONCRETE LIFTS WITH HORIZONTAL CHORDS NO GREATER THAN 10 FEET.
4. CONSTRUCTION LIFT HEIGHTS SHOWN ARE MAXIMUM. CONTRACTOR MAY SUBMIT ALTERNATIVE LIFT HEIGHT FOR APPROVAL BY ENGINEER.

SOURCE : Woodward-Clyde International (11/98)

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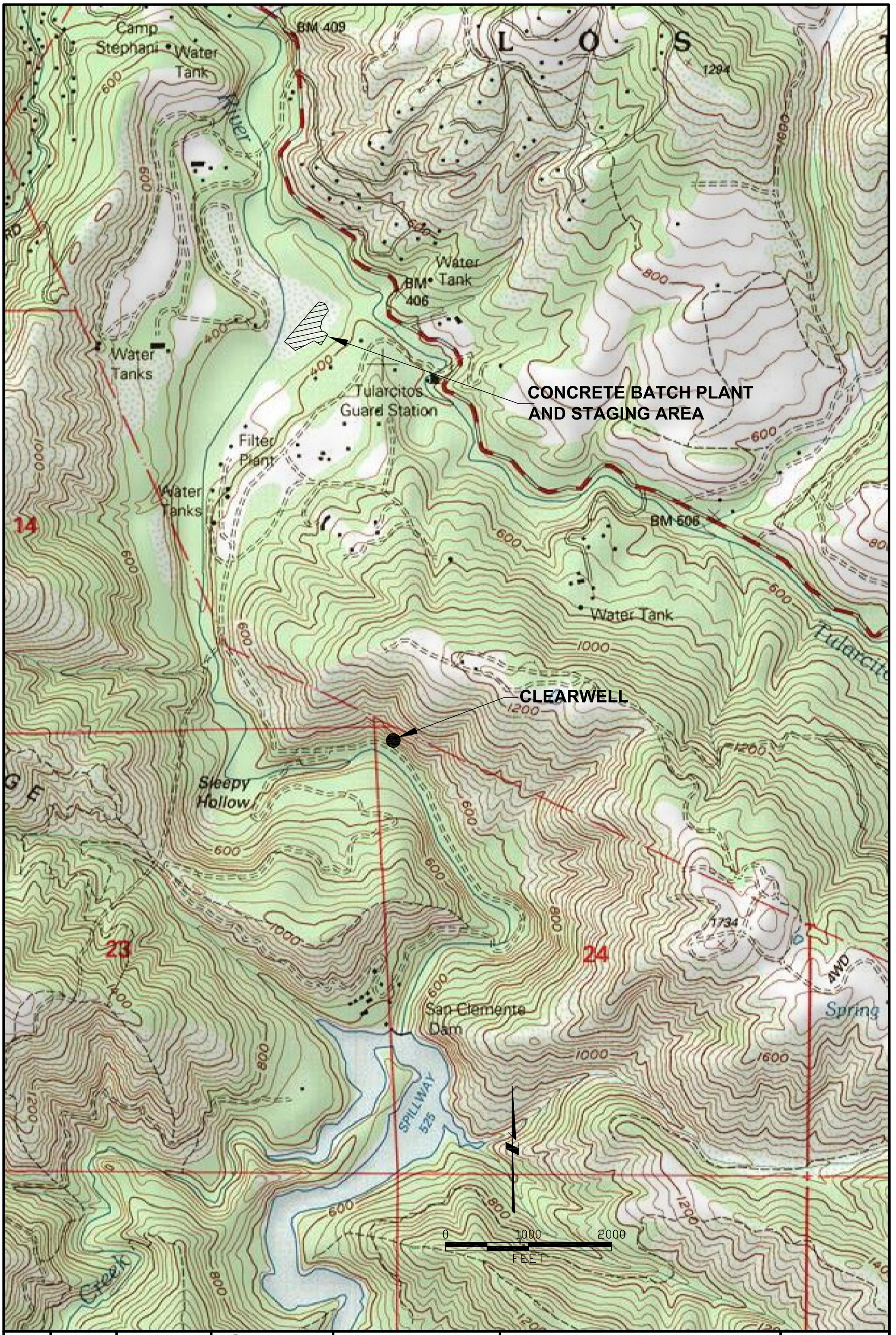
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CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
TYPICAL SECTIONS OF THICKENED DAM

Figure 3.2-7



SCALE	WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE	DESIGNED DRAWN CHECKED	MWH Walnut Creek California		*CALIFORNIA AMERICAN WATER* SAN CLEMENTE DAM SEISMIC SAFETY EIR/EIS PROJECT CONCRETE BATCH PLANT LOCATION	**Figure 3.2-8**

An additional proposed location for staging is an approximately 0.65 acre (28,000 square feet) site, located about 2,600 feet south of the CVFP along the unpaved access road that leads from San Clemente Drive to the Dam. The site was used as a construction and soil processing staging site for a facilities improvement project called the CVFP Clearwell (Water Tank) Project. If additional construction staging is necessary, this site may provide area for construction equipment and material storage. However, the Clearwell staging area is not large enough to accommodate the concrete batch plant needed for the project.

Based upon construction materials studies, the preferred source of aggregate is imported aggregate, since the quality of onsite aggregate is highly variable. By using an off-site source of aggregate, processing time can be eliminated and development and maintenance of a construction schedule is more predictable.

Off-site aggregate will be delivered and stockpiled near the concrete batch plant over an extended period of time in advance of the retrofit. Materials hauled to the batch plant for the retrofit include about 10,000 tons of coarse aggregate, 5,000 tons of sand, 24,000 sacks of cement, and 8,000 sacks of fly ash. This material will be used at the batch plant to produce approximately 5,800 cubic yards of concrete for the Dam and 1,400 cubic yards for the fish ladder. The concrete would be hauled to the Dam in concrete mixer trucks.

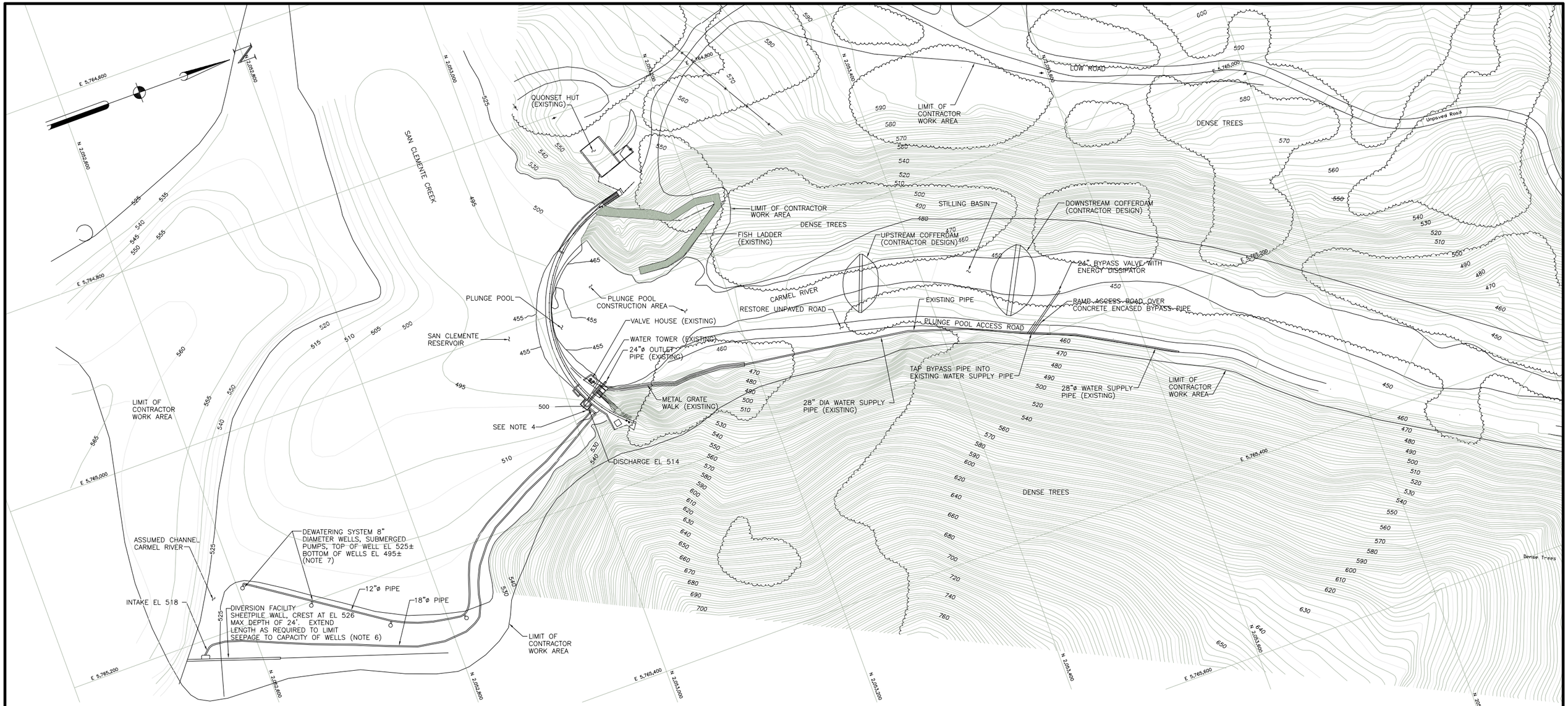
Dam Construction Reservoir Drawdown and Stream Diversion

The reservoir would be partially drained prior to concrete placement to reduce the hydrostatic force against the Dam while under construction. This would also provide some storage capacity as a contingency in case of unexpected storms. The water surface elevation would be lowered to approximately Elevation 510 feet. In addition, stream flows would be passed downstream to maintain the flow and habitat in the Carmel River during construction. Figure 3.2-9 provides and overview of drawdown characteristics for the proposed dam thickening.

The need to draw down the reservoir during construction constrains the main construction activities to a period when streamflow is low enough to be passed through a bypass pipeline and around the construction dam site. The target streamflow for construction is about 50 cfs.

The following steps would be taken to draw down the reservoir while maintaining the stream flow:

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1. LOCATION AND DEPTH OF CARMEL RIVER AND SAN CLEMENTE CREEK CHANNELS INTO THE DRAWN DOWN SAN CLEMENTE RESERVOIR ARE APPROXIMATE. CONFIRM PRIOR TO STARTING
2. LOCATION OF SEDIMENT CONTOURS WITHIN SAN CLEMENTE RESERVOIR ARE APPROXIMATE BASED ON CAL AM SURVEY IN SUMMER 1998. CONFIRM PRIOR TO STARTING WORK.
3. FINALIZE WITH ENGINEER LOCATION OF DEWATERING SYSTEM AND DIVERSION CUTOFF AS RESERVOIR IS INITIALLY DRAWN DOWN.
4. PROVIDE CONNECTION OF 12"ø PIPE (DEWATERING SYSTEM) AND 18"ø PIPE (DIVERSION FACILITY) TO FIT INTO 18" x 24" INTAKE VALVE AT EL 514 FT.
5. SIZE AND LOCATE THE COFFERDAMS AND STILLING BASIN FACILITY DOWNSTREAM OF THE PLUNGE POOL CONSTRUCTION AREA TO MEET CONSTRUCTION RELATED REQUIREMENTS.
6. SIZE AND LOCATION OF DIVERSION FACILITY IS DIFFERENT FOR DAM REMOVAL, NOTCHING, AND RIVER REROUTE WITH DAM REMOVAL ALTERNATIVES
7. DEWATERING SYSTEM NOT ANTICIPATED FOR DAM REMOVAL NOTCHING, RIVER REROUTE WITH DAM REMOVAL ALTERNATIVES

SOURCE : Woodward-Clyde International (11/98)

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CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
PLAN OF DRAWDOWN AND DIVERSION

Figure 3.2-9

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- Draw down the reservoir using the existing intake structure with gates at Elevations 515 feet and 495 feet. The high and mid level intake gates at Elevations 515 and 494 feet will need to be exposed from deposited sediments to draw down water below Elevation 515 feet. A sheetpile barrier would be installed around the intake. The sediment between the sheetpile barrier and the Dam intake would be removed and dewatered in a temporary basin. After the turbidity has cleared the reservoir would be lowered to Elevation 510 feet.

- At some point the turbidity of the water in the reservoir may be too high to release it directly downstream. A diversion facility, consisting of a sheetpile cutoff wall, would be installed in the channel upstream to divert incoming flows from the Carmel River through a 36-inch-diameter bypass pipeline. This pipeline would convey the river flow to the existing mid-level intake (which may be sealed to keep out turbid water) and continue through the existing 30-inch-diameter pipeline approximately 500 feet downstream of the Dam to an energy dissipation structure where the water would be released to the Carmel River bed. During the construction season most of this bypass flow is anticipated to be released from Los Padres Reservoir upstream. A similar, smaller sheetpile diversion facility and pipeline may be required to divert flows from San Clemente Creek around the Dam.

- Well points would be installed within the sediment deposits downstream of the diversion facility, as necessary to capture leakage water to maintain the water surface in the reservoir at the desired level. Pumps would be equipped with filters so that water coming out of the wells would be sufficiently clear to pass downstream.

Exact locations of the diversion facility and well points would depend on the actual sediment level when construction begins, and will be determined in the field at the time.

Site Activities at Plunge Pool

The process of thickening SCD requires dewatering the plunge pool at the downstream toe of the Dam, drying the downstream dam face, and installing two cofferdams downstream of the plunge pool to keep the site dry and to provide a settling basin.

The plunge pool downstream of the Dam would be completely drained prior to construction to prepare the foundation for the new concrete and to allow access for construction workers and machinery for placement of concrete. To keep the plunge pool staging area dry during construction, two cofferdams would be installed. One cofferdam is required to prevent backflow from the Carmel River. The second one would be located upstream to create a settling basin between the cofferdams. This basin would hold any leakage from the downstream cofferdam, and be used to allow settling or filtration of turbid water before it is released downstream.

The lower portion of the thickened dam would not be exposed to the plunge pool waters while the concrete cures. The temporary downstream cofferdam would not be removed until it has cured for at least 28 days, which is the standard concrete curing time. Due to the elevation above the plunge pool, the upper portions of the thickened dam would not

have any potential to be in direct contact with water during the curing process. After construction is completed and the cofferdams are removed, the cofferdams and the solids accumulated in the settling basin would be removed and used locally. Larger materials would be placed on-site for erosion protection and fines would be disposed of in the reservoir area.

The foundation surface and the downstream face of the Dam would be prepared prior to placing the new concrete overlay. Foundation preparation includes removal of alluvial deposits, loose rock blocks, overhanging rock, and weathered and highly jointed rock down to sound rock. Material would be taken to a local disposal site or used onsite as described above. Care would be taken not to undermine the existing dam. Other preparation includes cleaning the foundation surface with high-pressure water jets; excessive excavation of shear zones and dikes; dental excavation of loose infill materials and washing these zones; filling of joints with slush grout; and filling of voids and depressions with dental concrete.

Dam downstream face preparation would include: sandblasting or water blasting of the downstream surface to clean the surface; drilling holes and installing steel dowels; and pre-wetting the surface for the 24 hours prior to concrete placement to maximize the bond between the new concrete blocks and the existing concrete.

A large tower crane with a concrete bucket would be used to place the concrete. The crane would be located downstream of the Dam in the drained plunge pool to provide adequate access to the entire footprint of the Dam, from the crest down to the foundation. Bucket placement has been assumed instead of pumping. Pumping is not suitable for this application because it would require a higher slump and smaller aggregate. This would result in more shrinkage and would therefore be detrimental in bonding the new concrete to the old, which is a concern of DSOD.

New outlet valves would be installed and tested after concrete placement. In the final task before demobilization, the construction joints between the concrete blocks would be grouted through a system of embedded grout pipes after the concrete has cured. In a dry year this could occur as late as January, otherwise it would take place after uncontrolled winter spills have stopped.

Abutment Protection

The rock at the right abutment appears to be insufficient to support the loads imposed by the thickened structure. To provide sufficient support for the thickened dam, the right abutment may require extending a new concrete wall approximately up to 50 feet into the abutment to tie into more competent rock. Scaling would be required to remove weathered and fractured rock, and rock bolting may be necessary to secure some potentially unstable rock blocks. In addition, much of the right abutment would be covered with reinforced concrete or shotcrete to protect it from the erosive forces applied by overtopping flows.

The left abutment is likely acceptable except for localized areas that would require dental excavation or strengthening of intensely fractured rock and filling of voids. Rock bolting would be performed to secure potentially unstable rock bolts. Portions of both abutments that exhibit weathering or a significant degree of cracking would be covered with shotcrete as appropriate to protect the surface from scour during overtopping.

Final design would include detailed geologic mapping and a drilling program into rock on both the left and right abutments to further define rock quality, joint orientation and stability, enabling further refinement of the preliminary design assumptions, excavation plan, and construction quantities.

Spillway and Crest Modifications

The spillway and dam crest would be modified to increase the effective spillway width and reduce the amount of overtopping during the PMF. The spillway superstructure (shown in Figure 3.2-4) on the top of the Dam would be removed. The normal maximum controlled water surface will be limited to Elevation 525 feet with no flashboards or gates. The hydraulic capacity of the spillway would be increased by reducing the number of piers from 23 to 2, thereby increasing the effective spillway width. In addition, the increased spacing between piers would reduce the buildup of downed trees and other debris at the existing closely spaced piers. A catwalk bridge would be constructed across the three spillway bays.

The Dam crest would be raised from Elevation 537 feet to Elevation 539.5 feet by constructing a parapet wall along the upstream edge of the crest. This has no effect on current or future water storage. These measures would increase the spillway capacity at the parapet elevation from about 20,000 cfs to about 27,000 cfs. This compares to a 100-year flood flow of about 25,000 cfs. Overtopping of the parapet wall during a PMF would be reduced from 14 feet to 10 feet. The spillway design would be modified to increase the cantilever (overhang) from one foot to 4 feet, maintain the center bay set at Elevation 525.0 feet and raise the crest of the side bays to Elevation 525.5 feet. These modifications to the spillway design have been incorporated into the project to minimize the potential for out-migrating fish to strike the Dam face.

Modification of Low-Level Outlet Works

The existing low-level outlet works include an upstream gate house over a stilling well. Three manually operated sluice gates control inflow into the well. A 24-inch-diameter pipe passes through the Dam and connects the existing well to a 24-inch-diameter steel wye branch just downstream of the Dam. One leg of the wye has a 24-inch gate manual shutoff valve and a 12-inch manual flow control valve and discharges to the river. The other is controlled with a 24-inch manual gate valve and discharges to the 30-inch-diameter pipeline to the CVFP. The wye and valves are in a small valve house at the toe of the Dam that is within the footprint of the proposed concrete buttress.

Due to the sedimentation buildup on the upstream face of the Dam in this area, the existing control structure will be abandoned-in-place and a new structure and outlet pipe will be constructed on the left upstream face of the Dam, in the vicinity of the new 10-ft. diameter sluice pipe at Station (Sta) 6+23. The three manually operated sluice gates controlling inflow into the existing well will be abandoned-in-place and removed from service. The existing 24-inch diameter pipe penetrating the Dam will be abandoned-in-place and infilled with concrete. A single manually operated sluice gate will be installed at the new outlet works location at approximately Sta 6+12 and invert Elevation 519. Trashrack protection of the upstream intake will be provided. The existing wye branch, valves and building downstream of the Dam will be removed. The new 24-inch pipe penetrating the left side of the Dam would be routed down the left downstream face of the existing dam, and across the Dam to the right downstream face, where a new wye branch and 24-inch butterfly valves will be provided connecting to the CAW water system. The leg to the river will include a 24-inch manual shutoff valve and a pneumatically operated 12-inch flow control valve. The leg to the CVFP pipeline will have a 24-inch pneumatically operated shutoff valve. Control of flow will be from the filter plant.

The new 24-inch pipe located on the downstream face of the existing dam will be encased in the new cast-in-place concrete blocks, in order to protect it from discharges over the spillway. The pipe has been routed near the base of the Dam in order to maximize the concrete encasement of the pipe. At the elevations shown, the additional concrete thickness is at least 6 feet, compared to the 2 feet diameter of the pipe. The dowels connecting the new concrete to the Dam are 14 inches long, leaving almost 5 feet of concrete for unobstructed placement of the pipe.

The invert of the new 24-inch pipe on the upstream face of the Dam has been placed as low as reasonably possible (and therefore close to the 10-foot diameter sluice pipe) to maximize water depth, while minimizing blockage from debris near the surface, or passage of sediment from below.

One possible alternative to placement of the pipe within the new downstream concrete face would be to run the pipe across the new downstream face of the Dam, horizontally underneath the new 4-foot wide lip of the spillway. This would eliminate the direct flow of water onto the pipe during spilling by raising it to a protected area. However, service and maintenance of the pipe in this location near the top of the Dam would be difficult.

High-Level Outlets

A high-level outlet equipped with a 10-foot diameter sluice gate would be installed during the proposed dam thickening as shown in Figure 3.2-5. This will enable controlled and limited sediment releases to maintain both upstream passage to the fish ladder exit and access to the upper gates of the existing low-level outlet works. The discharge of sediment would be regulated by the United States Army Corps of Engineers (USACE) as described in Chapter 1. It is anticipated that the high-level

outlets would be operated during the rising limb of early to mid-season storms to release small amounts of sediment while maintaining flow in the fish ladder.

The outlet would be positioned near the fish ladder exit with the invert below the level of the spillway crest (Figures 3.2-5 and 3.2-6). The exact location and elevation of the outlet would be determined in conjunction with the final design of the fish ladder. The gate could be opened during high flows (in excess of ladder flow capacity) to keep the river flowing through the approach channel to the ladder exit as much as practicable. The objective would be to keep the river channel through the reservoir sediments directed at the vicinity of the ladder exit. Therefore, the sluice gate would be located as close as possible to the ladder exit consistent with downstream plunge pool conditions, abutment protection requirements, and fish fall-back considerations.

The outlet would be formed in the new concrete section of the Dam. In the existing concrete section, it would be constructed by drilling an oversized conduit through the existing concrete, placing an inner steel liner in the conduit, and grouting the annulus between the steel liner and the excavated conduit. The lined outlet would discharge to the downstream face of the thickened dam. This gate would be installed against the upstream face of the existing dam. A trashrack would be installed upstream of the gate to protect it from logs and large debris. Minor sediment excavation would be needed to allow installation of the gate and trashrack. This may be accomplished by installing a small sheetpile barrier around the proposed gate inlet. The sediment between the sheetpile barrier and the gate inlet would be removed.

Electrical System

The existing electrical service is supplied by a Pacific Gas & Electric (PG&E) 12-kilovolt (kV) 3-phase pole line located immediately outside an onsite structure above the left abutment of the Dam. Pole mounted transformers provide 3-phase service, which in turn provides service to the Dam itself and a nearby CAW owned residence. Construction power requirements are dependent upon the type and location of any cranes, and dewatering requirements. The need for 480-volt 3-phase 150-kilovolt-ampere (kVA) service has been identified for electrical upgrades for the Dam thickening. This would require changing the transformer but would not require new power poles. A new 50-ampere (amp) service panel would be installed in place of the existing 15-amp service panel. The existing structure would be replaced with a small pre-engineered building that would house the electronic controls for the outlet valves.

3.2.5 PROJECT ACCESS AND IMPROVEMENTS

Access from Carmel Valley Road to San Clemente Dam

Access to the Dam and reservoir is currently provided via San Clemente Drive, a gated road that extends from Carmel Valley Road, through the Sleepy Hollow Subdivision. San Clemente Drive crosses Tularcitos Creek over a single-lane bridge approximately 17 feet wide and leads to CAW gates at the southern bounds of the Sleepy Hollow subdivision. This locked gate prevents public access to the reservoir. San Clemente

Drive is paved from Carmel Valley Road to the locked gate. The road is unpaved from the locked gate to the reservoir. Two other private roads have gated access to the Project Site from private properties to the south and west.

From the turnoff to the filter plant, San Clemente Drive runs approximately 1.7 miles to the base of the Dam. A narrow “pipeline access route” parallels a portion of this route. Access to the left abutment of the Dam is possible by either the “High Road,” crossing a ford across the Carmel River, or via the “Low Road,” using an existing bridge across the river at the OCRD 1,800 feet downstream from SCD. Improvements will consist of widening and providing turnouts along sections where the terrain permits, and grading and pruning sections of the road. Improvement of the plunge pool access road between the OCRD and the base of SCD would also be necessary to stage the tower crane and other construction equipment at the base of the Dam. The Old Carmel River Dam Bridge (OCRB) would also require upgrading to accommodate heavy loads and large trucks carrying construction equipment. Approaches to the bridge would require modification for long loads and some structural members would be replaced.

Access from Carmel Valley Road to CVFP (Tularcitos Access Route)

The 3-mile access road to SCD from Carmel Valley Road would require realignment and improvements to accommodate heavy equipment used for construction activities. Road realignment includes construction of a new access road (Tularcitos Route) to provide a better line of sight and to bypass the Sleepy Hollow subdivision. The new road would start at Carmel Valley Road about 800 feet west of San Clemente Drive, transverse Tularcitos Creek over a new bridge, and provide access to the proposed staging area and batch plant. The existing road between the staging area and the filter plant would be upgraded and widened.

This road would be developed as a permanent access road to the CVFP and SCD. After completion of the road, the portion of the San Clemente Road that runs through Sleepy Hollow would no longer be used except for emergencies. The location of the proposed turnoff from Carmel Valley Road was selected along a straight section of Carmel Valley Road and provides a sight distance of at least 300 feet in either direction. "Truck Crossing – 500 Feet" signs would likely be necessary on both Carmel Valley Road approaches. An encroachment permit would be required from the County of Monterey. A 100-foot transition on the West Side of the intersection would be constructed. Asphalt pavement for the transition section and 25 feet from the intersection would be installed to protect the Carmel Valley Road edge of pavement and to reduce dust at the intersection.

Approximately 175 feet south of Carmel Valley Road the alignment crosses Tularcitos Creek, where a permanent single-lane bridge will be constructed. This is planned to be a steel truss bridge with a span of approximately 200 feet with a wood deck and concrete abutments. Though this creek normally contains minimal flow, the contributing watershed at this location is approximately 36,000 acres. A 100-year storm would result in a flow of approximately 5,500 cfs. It has been estimated that a bridge with a clear

area of approximately 800 square feet underneath would be necessary to pass flood flows of this magnitude.

The proposed road itself from Carmel Valley Road to the CVFP would consist of a 22-foot wide graded section with a 3-foot-wide drainage ditch. The surface would have 6 inches of Class II base rock installed. After construction of the Dam improvements, a double seal coat would be placed as a minimum-wear surface. Fifteen-inch diameter culverts with inlet structures would be installed at approximately 400-foot intervals for drainage.

About 1,100 feet from Carmel Valley Road the access road must cross the existing 30-inch diameter discharge line from the CVFP. This pipe is supported approximately three feet above the ground by concrete piers at approximately every joint. This crossing is also located on a ridge at a saddle. The proposed access road would pass over the pipe. This will require removal of the concrete pipe supports and subsequent burial of the pipeline below the planned road surface.

Beyond 1,300 feet from Carmel Valley Road towards the CVFP, the proposed access road is on flat land where little grading is required. From 2,700 feet from Carmel Valley Road, the proposed access road follows an existing single lane road until about 4,300 feet from Carmel Valley Road. At approximately 3,250 feet from Carmel Valley Road the road crosses over the existing 30-inch diameter pipeline again. At approximately 3,900 feet from Carmel Valley Road, the alignment connects with existing pavement next to the CAW caretaker's house. The existing pavement would be widened to two lanes to approximately 4,300 feet from Carmel Valley Road. At this point the two-lane road could be split into two one-lane roads: the existing single-lane paved road leading up to and beyond the existing water tanks to San Clemente Drive (approximately 900 feet), and the pipeline access road, which also joins San Clemente Drive.

Access from Existing Gate to San Clemente Dam

San Clemente Drive is a one-lane unpaved service road with turnouts from the locked gate (at San Clemente Drive Station Sta 51+80; refer to Figure 3.2-2 for station reference location) to the junction of the upper and lower dam roads, a 3,200-foot-long reach. Under the Proposed Project, this section is to be widened where conditions warrant, providing an 11 to 12-foot road width for one-way, controlled traffic. Rock outcrops or trees may make two-way travel difficult on several short segments of this route. This may be acceptable provided there is adequate sight distance for approaching vehicles. The General Contractor can also use flagmen, radios, and designated pullouts to control two-way traffic on one-lane access roads.

San Clemente Drive splits at the concrete ford over the Carmel River (near Sta 83+00), with one lane providing access to the base of the Dam, and one lane providing access to the top of the Dam. The low road to the top of the Dam crosses Carmel River at the OCRB. The OCRB has an overall length of approximately 200 feet and requires structural improvements to carry heavy trucks. These improvements would consist of

replacing the existing piers with stronger and more deeply set piers, resetting the steel structure and replacing the wood deck with a wider, stronger steel deck. Two piers that extend approximately 15 feet above the OCRD crest currently support a bridge constructed of steel I-beams with timber decking and guardrails. The bridge is supported by the two intermediate piers as well as abutments at either end of the bridge on the river's northern and southern side, completing the bridge span and access road connection across the Carmel River. The southern bridge abutment is reinforced by a masonry wall that extends down to the edge of the river bank.

The existing OCRB would require structural improvements in order to accommodate heavy loads from construction equipment using the bridge to access the SCD left abutment and as part of the one-way access route for construction traffic (for the Proponent's Proposed Project only). The new bridge will be designed to handle double-axle loads (Caltrans category H1544, Type 3 legal loads), whereas the current bridge is rated to handle only light duty traffic.

In addition, approaches to the bridge would need to be modified for long loads. The new alignment of the bridge would change slightly by moving the north bridge abutment approximately 10 feet west. The bridge improvements would include:

- Demolition and replacement of the existing piers just upstream of OCRD with stronger and more deeply set, 4-foot diameter drilled piers;
- Excavation of a new foundation at the northern abutment;
- Demolition and replacement of the existing beams that support the bridge on the abutments;
- Removal (prior to pier demolition) and then resetting the steel structure (i.e., I-beams that support the bridge deck); and
- Replacing the wood deck with a wider, stronger steel deck.

The high road access to the Dam begins at the junction with the low access road. This road is a single lane and climbs approximately 500 feet then drops almost 400 feet to the top of the Dam, an overall distance of approximately 10,500 feet. The road requires grading and some widening, cut or fill slope stabilization, and vegetation removal.

At the OCRD, an existing unimproved single lane road follows the East Side of the Carmel River to the plunge pool at the base of the Dam ("plunge pool access road"). This road has been in limited use and has a number of washouts from the 1995 and 1998 floods. The roadbed would be filled with sand and gravel and topped with crushed rock to create a safe, uniform surface. This road can be upgraded with minimum tree pruning and removal to provide one lane, two-way access and designated pullouts.

The majority of truck traffic would use the low road and plunge pool access road to the staging and work area at the base of the Dam. It is possible that the low road could be the route for "inbound" traffic to the top of the Dam and the high road could be the route for "outbound" vehicles, for materials that are brought to the top of the Dam.

Pipeline Access Road

A 3,000-foot-long existing dirt road (pipeline road) begins at the southerly end of the filter plant and parallels the raw water pipeline to the Dam until it joins San Clemente Drive. Because of a switchback and its steep grade, this road could be used by empty trucks returning to the batch plant as a partial one-way loop. After leaving the filter plant, the pipeline road immediately crosses over the pipeline and heads south adjacent to the westerly side of the exposed pipeline. Within 300 feet of the crossing, the road narrows. There are three sections of this road that are between 9.0 and 9.5 feet wide. Attempts have been made to install wooden retaining walls (one to two feet high) to retain the fill on the downhill side. These retaining walls are failing and would not stand up to 10-wheel truck traffic. Clearing of limbs and grading to a smooth surface would be necessary. The road passes over the raw water pipeline at three locations. Sufficient cover over the pipeline must be maintained to prevent damage to the pipeline.

The three narrow sections would require widening to approximately 11 feet for use by construction equipment. Retaining walls approximately 30 to 50 feet long and up to three feet high would need to be installed. A switchback near the southern end of the road would be improved, but there may not be sufficient space for a 10-wheel truck to make a continuous turn without having to stop and back up at least one time.

From the switchback, the road rises over a distance of 400 feet to join San Clemente Drive (San Clemente Drive approximate Sta 64+50). Most of this section of road (approximately 300 feet) is at a 21 percent grade. Because of the switchback, which probably would require one back-up movement to negotiate, and the 300 feet of 21 percent grade, it is likely the pipeline access road would only be used for empty vehicles during construction.

3.2.6 FISH PASSAGE

Old Carmel River Dam (OCRD) Fish Passage Improvements

The OCRD, approximately 1,800 feet downstream of SCD, was built in 1893. This 32-foot high masonry-faced dam was originally constructed as a water diversion facility, but no longer serves any diversion function. It is approximately 140 feet long, 8 feet wide at the base and 4 feet wide at the crest. A pool and weir fish ladder is located on the left bank (looking downstream) of the Dam, constructed in part by excavating rock from the steep wall of the canyon. The right bank contains an open passageway approximately 4 feet wide by 15 feet high that at one time was equipped with a gate and operated as a sluiceway and control to raise water levels for operation of a diversion. This structure was modified in 1992 and 2000 by removing several stoplogs and the gate structure from the passageway.

The OCRD was retrofitted with a fish ladder on the west side (left, looking downstream) about the time that SCD was constructed. Significant problems with adult upstream fish passage at OCRD have been documented. These include poor attraction flow and rock and debris jams in the fish ladder, causing the majority of fish to bypass the ladder and attempt to jump the Dam. The thick dam crest creates an area of local high velocity that often results in fallback of fish that successfully jump the Dam. Therefore, the project proposes to notch the east end of the OCRD (right side in downstream) about 9 feet deep and 19 feet wide to improve low flow passage without inducing geomorphic changes to the downstream pool configuration. The proposed OCRD notching and bridge improvements are shown in Figures 3.2-10 and 3.2-11).

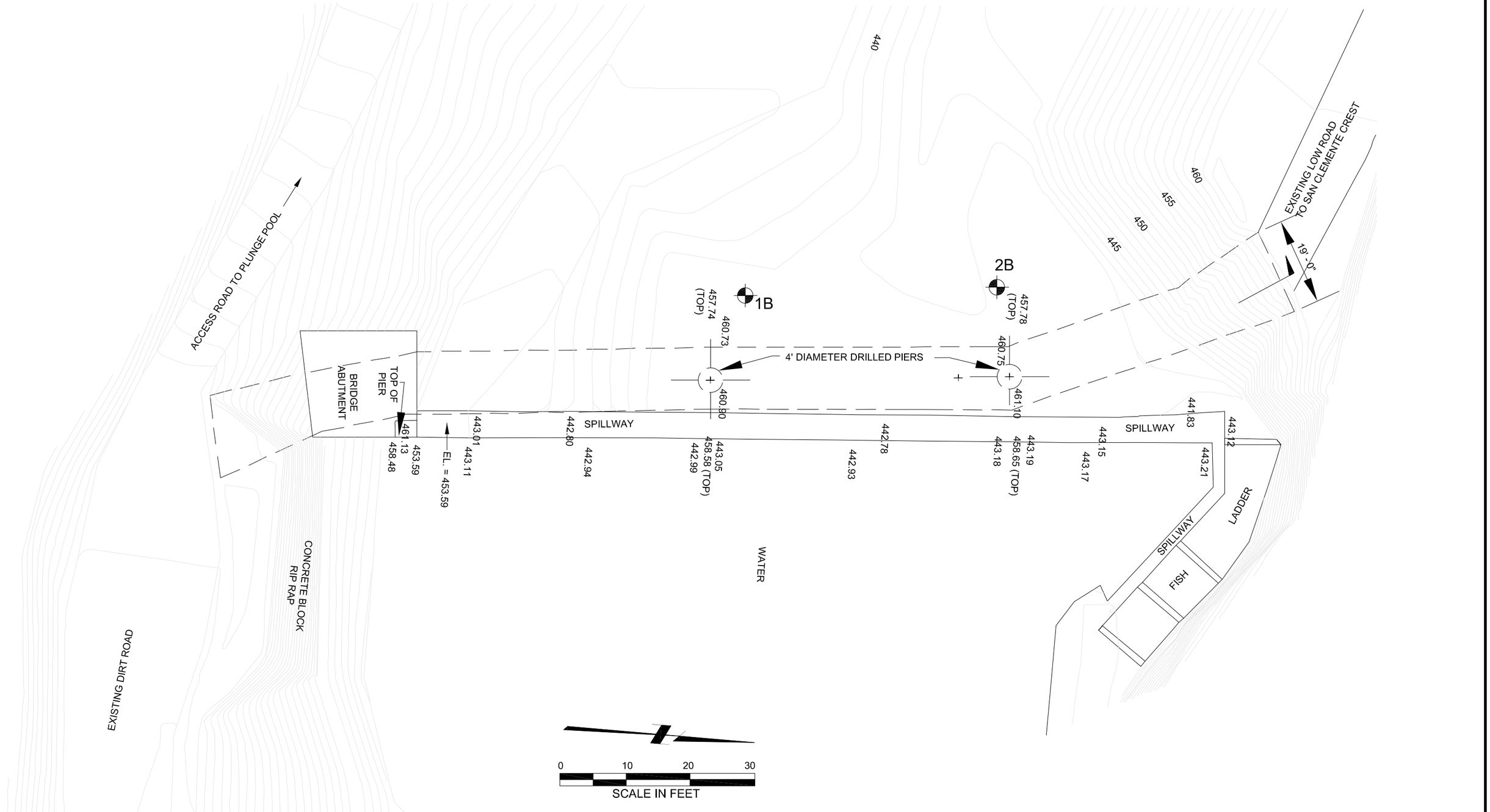
San Clemente Dam Fish Ladder Replacement

The existing fish ladder does not conform to current fish ladder criteria. It would be removed and replaced with a vertical-slot ladder. The ladder would be demolished after the migration season ends (June) to make way for grading and framing a new ladder.

The new ladder would be poured and finished by late summer/fall in time for fish to use it in the next migration season.

The proposed ladder entrance is located on the left bank (looking downstream) of the plunge pool, near the location of the existing ladder entrance. The proposed ladder exit is located on the left abutment at the top of the Dam, approximately 68 feet in elevation above the plunge pool water surface level. The transportation channel of the proposed ladder would be comprised of 68 pools, each having typical dimensions of 10 feet long by 8 feet wide, resulting in an average slope of 10 percent and a total length of 730 feet (including entrance, outlet and resting pools). The proposed layout divides the transportation channel into four segments; each connected by a switchback that also serves as a resting pool (Figure 3.2-12)

The conceptual fish ladder hydraulic operating conditions are summarized as follows. For stream flows up to 55 cfs, all flow would pass through the proposed ladder. For stream flows in the range of approximately 55 to 115 cfs, most of the flow (55 to 62 cfs) would pass through the proposed ladder. The remaining flow would spill over the lower, center spillway (at Elevation 525.0 feet). Above stream flows of approximately 115 cfs, spill would also occur at the higher two spillway segments (Elevation 525.5 feet). The high design flow of 773 cfs (based on five percent exceedence) is expected to occur at approximate reservoir Elevation 526.7 feet. At this elevation, approximately 73 cfs would pass through the proposed ladder, while approximately 700 cfs would pass over the spillway. At the low fish passage design flow, there would be approximately 2 feet of water depth in the vertical slot above the 12-inch sill, resulting in a pool depth of about 3 feet.



SOURCE : Woodward-Clyde International (11/98)

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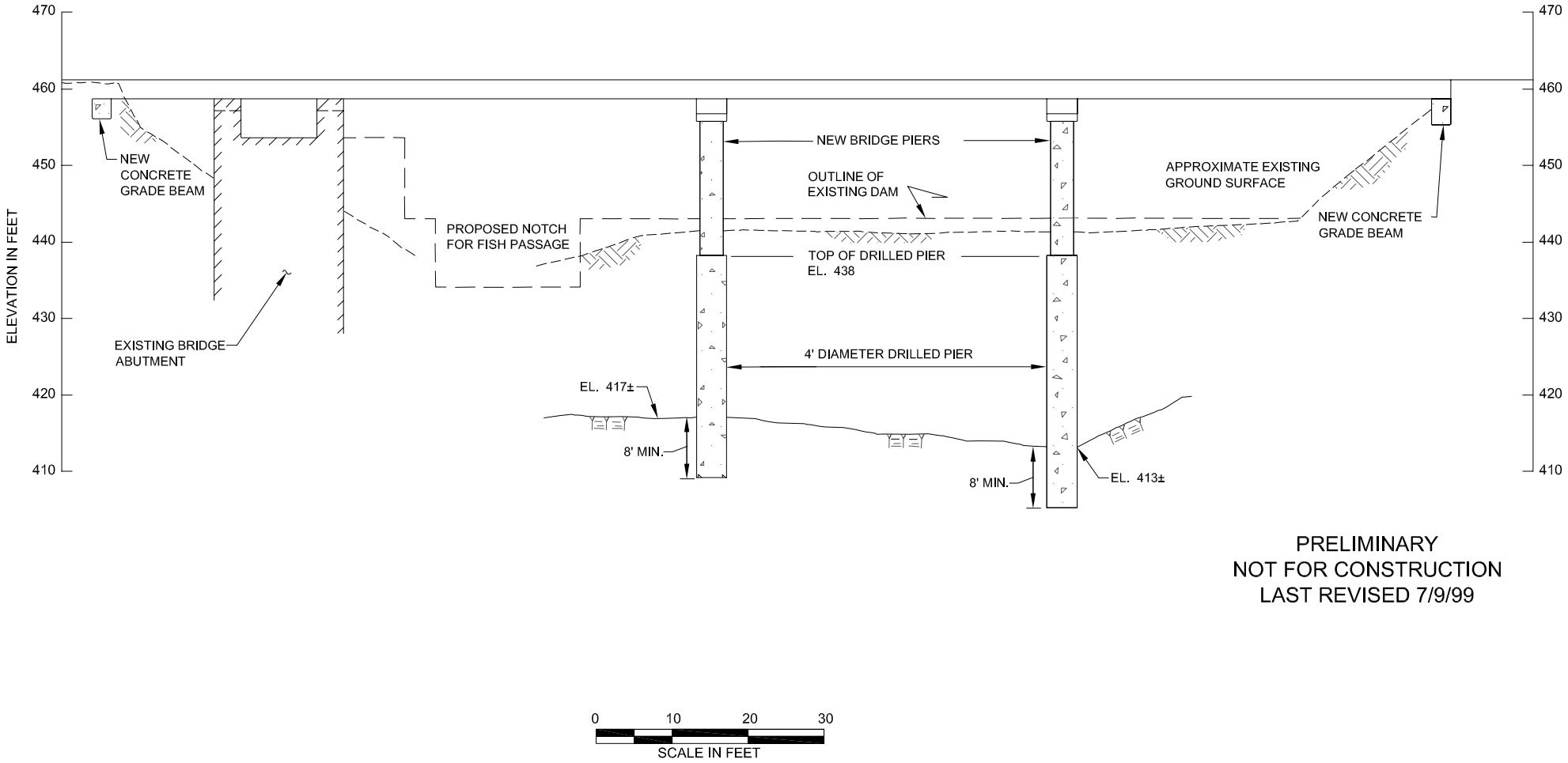
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OLD CARMEL RIVER DAM BRIDGE PLAN

Figure 3.2-10



PRELIMINARY
NOT FOR CONSTRUCTION
LAST REVISED 7/9/99

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SOURCE : Woodward-Clyde International (11/98)

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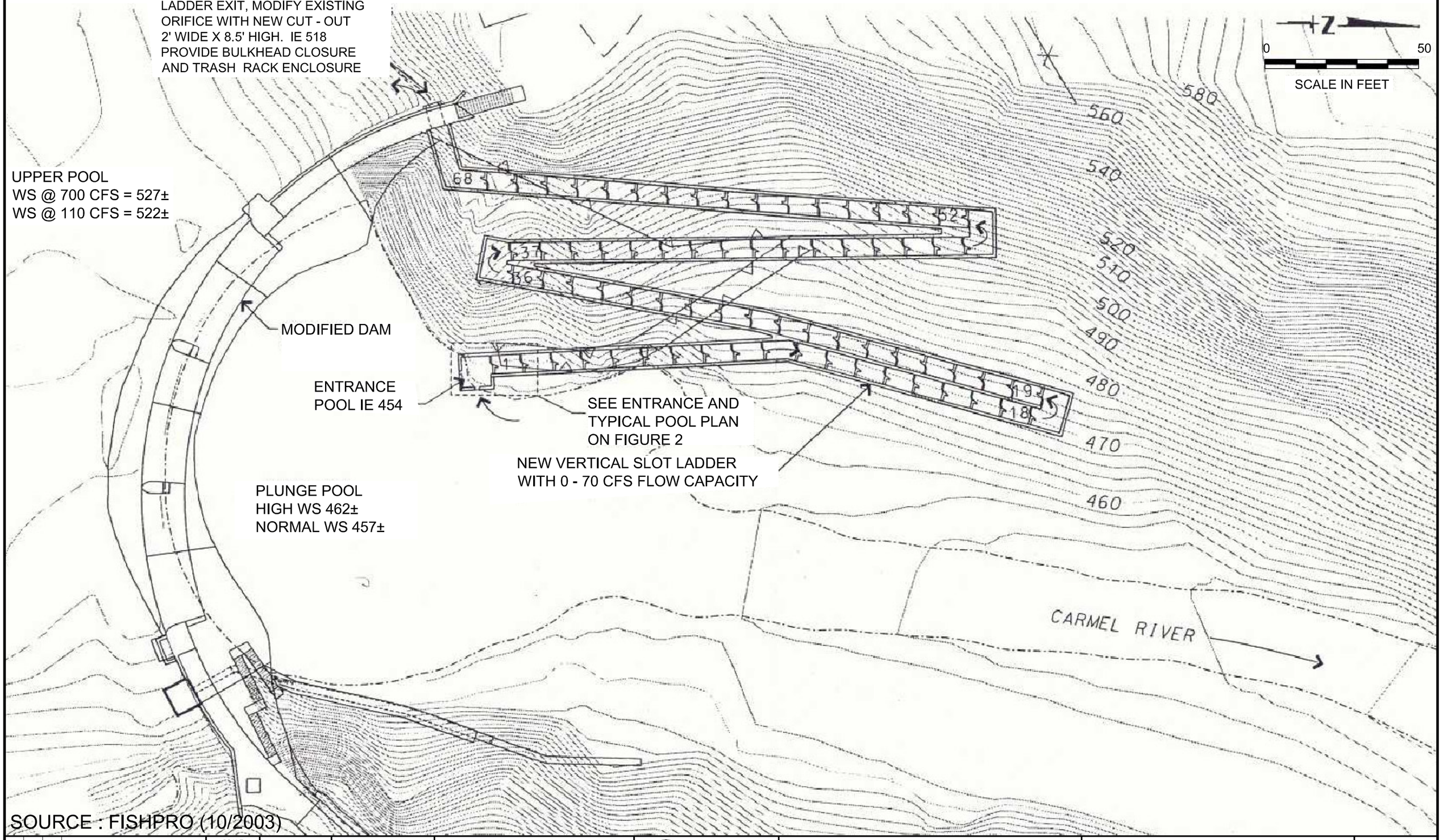
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SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
OLD CARMEL RIVER DAM BRIDGE PROFILE

Figure 3.2-11



SOURCE : FISHPRO (10/2003)

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FISH LADDER PLAN

Figure 3.2-12

The proposed ladder would be equipped with baffle walls at 10-foot intervals that create 68 standard pools within the transportation channel. Each baffle wall would have a 15-inch-wide vertical slot that extends the full height of the channel, except for a 12-inch-sill located at the bottom of the slot (Figure 3.2-13). At 70 cfs flow, the water depth would be approximately 8.5 feet above the top of the sill, and there would be a consistent velocity of approximately 6.6 feet per second through the slot regardless of depth. A total depth of 12 feet in each step of the ladder (including the 1-foot sill) would give the ladder a maximum capacity of approximately 90 cfs. The entire ladder would be covered with grillage to prevent fish from jumping out of the ladder, as well as to prevent falling rock from entering the ladder.

The entrance pool for the proposed ladder (located in the plunge pool) would be designed to provide a minimum of 3 feet water depth under low flow conditions. Given the estimated low water surface at Elevation 457 feet, the entrance pool would have an estimated floor at Elevation 454 feet.

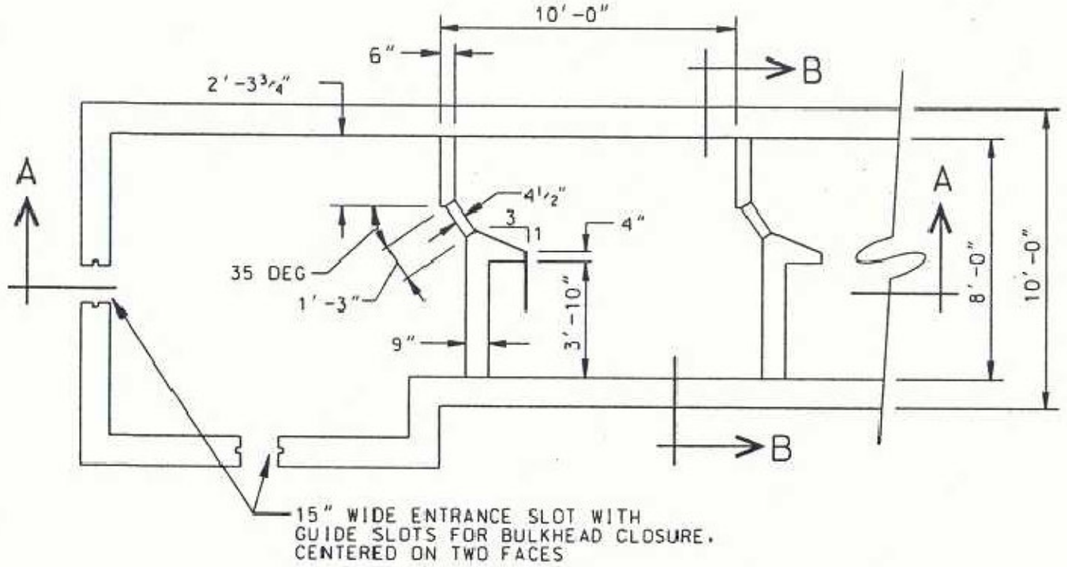
The existing ladder exit orifice (at the upstream face of the Dam) would be modified to achieve proposed hydraulic operating conditions in which all stream flow up to 55 cfs would be routed through the ladder. The existing orifice is 4 feet wide by 2 feet high with invert at Elevation 524.5 feet. The proposed ladder exit would lower the invert to Elevation 518.0 feet and would provide a 2-foot wide slot that is 8.5 feet high. The ladder exit would be equipped with a trash rack on the upstream face of the Dam, and it would have a bulkhead closure to allow ladder closure for maintenance or for protection under extreme high flow conditions. Dredging may be used to establish a fish passage channel prior to the beginning of each migration season.

Reservoir Maintenance

The river channel upstream of the fish ladder exit would be regularly inspected to assure that adequate channel depths exist for upstream passage of adult steelhead. When necessary, and when flow and rainfall conditions are met, sediment management operations would be conducted to maintain the upstream river channel for fish passage (see the Sediment Operations and Management Plan [SOMP] for Fish Passage, Appendix J for further detail).

The sluice gate and associated sluice way will be installed through the Dam at invert elevation of 515 feet, offset 10 feet horizontally and 2.7 feet vertically (down) from the fish ladder invert (Figures 3.2-5 and 3.2-6). The sluice way will be constructed by sawcutting a 10+ foot diameter orifice into the existing dam and inserting a 10 foot nominal diameter steel liner to complete passage through the thickened dam to the downstream face. The 10-foot internal diameter sluice gate, constructed of steel and cast iron (Figures 3.2-5 and 3.2-6), will be anchored to the Dam upstream face and remotely operated by an automated gate opening mechanism. The automated operating mechanism and manual emergency crank will be located at the Dam crest, where a physical connection to the gate via a threaded steel bar is turned to lift the gate for opening and closing.

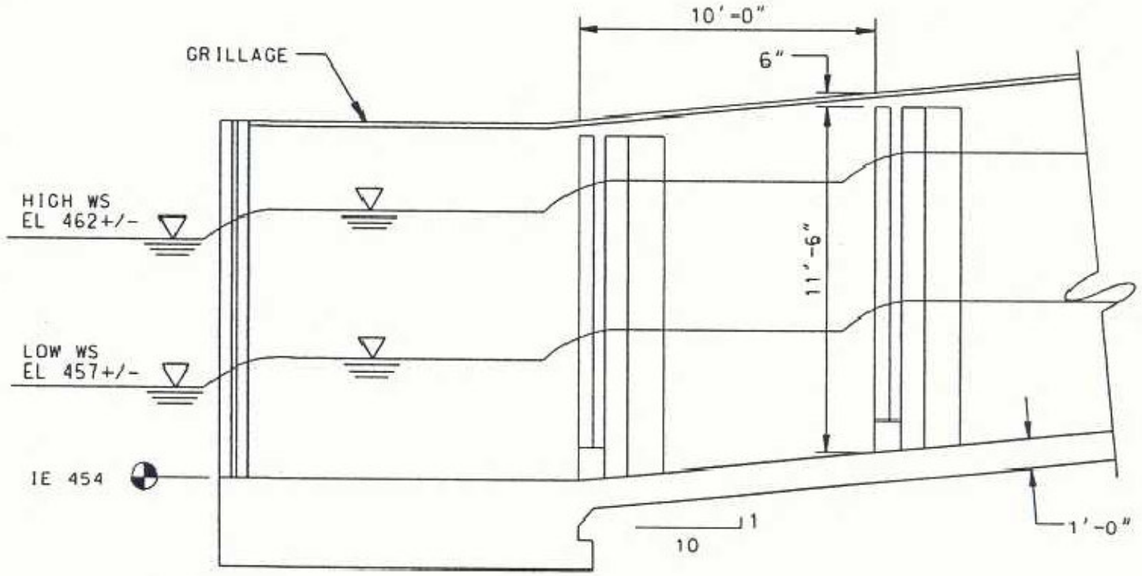
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ENTRANCE AND TYPICAL POOL PLAN

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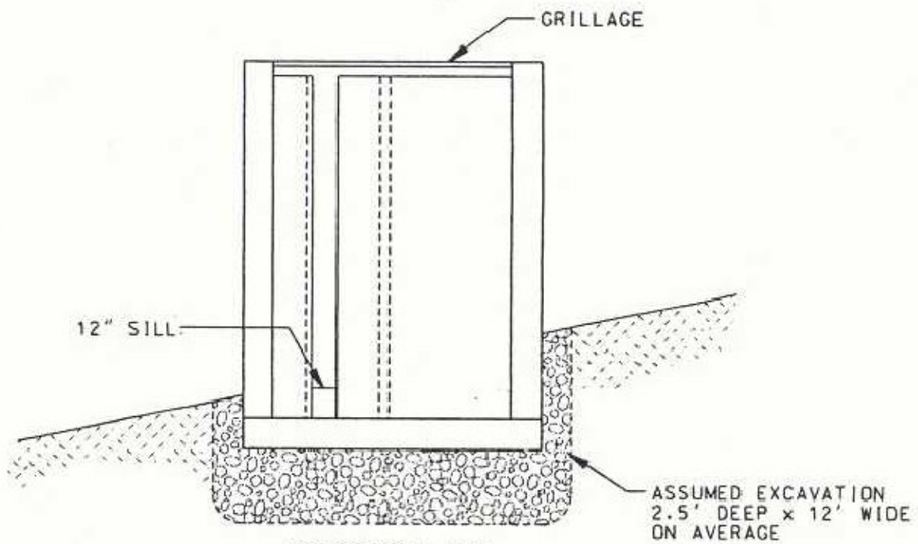
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SECTION AA

0 3 6 9

SCALE IN FEET



SECTION BB

0 3 6 9

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SOURCE : FISHPRO (10/2003)

REV	DATE	BY	DESCRIPTION

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CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
FISH LADDER ALTERNATIVES

Figure 3.2-13

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3.2.7 CONSTRUCTION SCHEDULE AND OPERATIONS

A conceptual schedule is presented in Figure 3.2-14. Following the State Notice of Determination (NOD) and Federal Record of Decision (ROD), final engineering studies would begin in CY 2. Preparation of final design drawings for the Dam, development of studies and design drawings for the fish ladder, and bidding of a construction contract package would occur in CY 3. Actual schedules will vary depending on when work begins.

Construction will occur in two distinct phases. Phase 1 generally includes mobilization, construction of the new Tularcitos Access Road to the CVFP, OCRD bridge improvements, road aggregate delivery, improvements to existing access roads and demobilization. Phase 2 includes the seismic retrofit of the Dam and fish ladder construction, including mobilization, delivery of concrete aggregate, reservoir dewatering and diversion, foundation excavation for the Dam thickening and fish ladder, concrete placement for both dam and fish ladder, valve and gate installation, joint grouting, and demobilization.

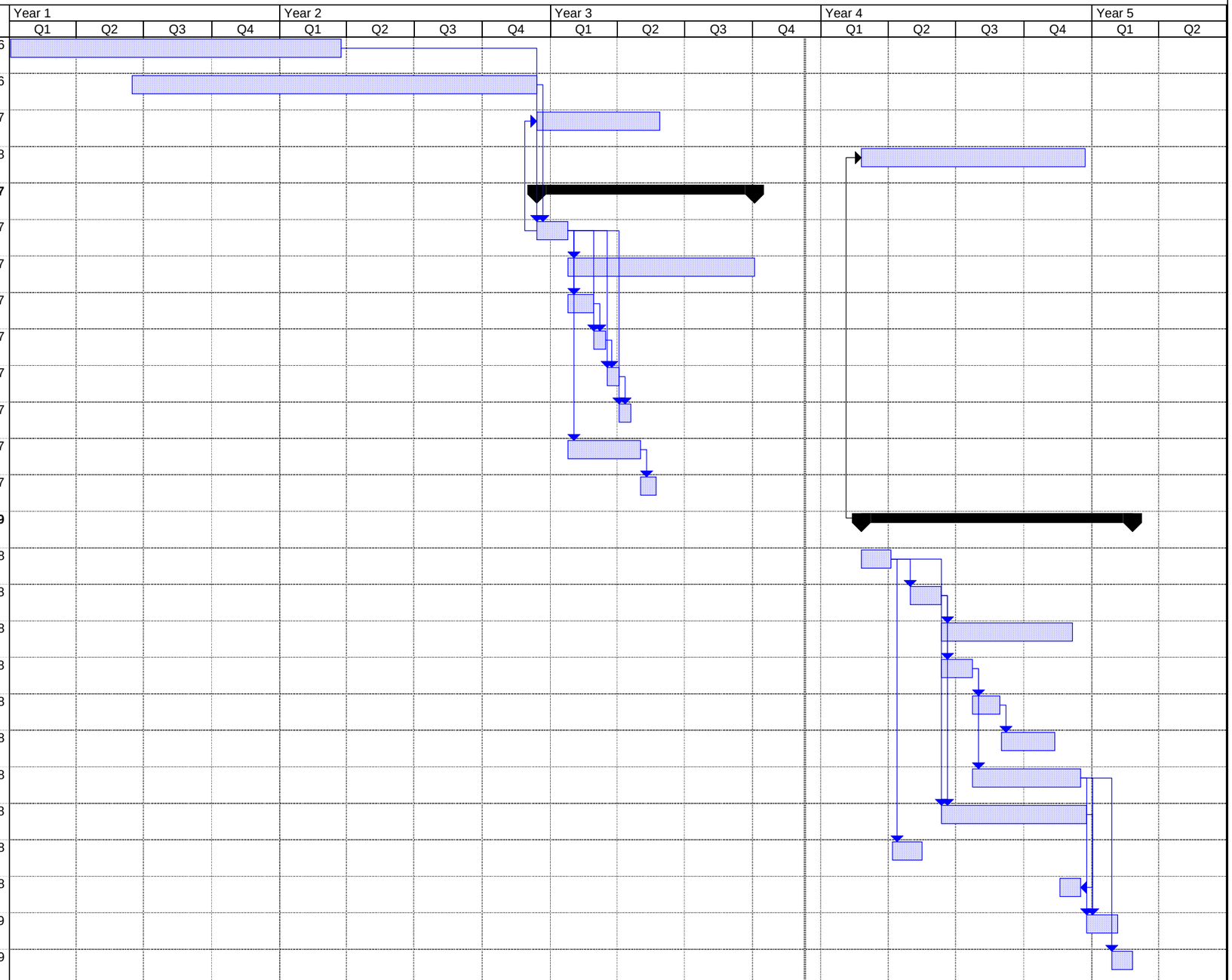
The majority of the work in Phase 1 is planned to take approximately 10 months between December of CY 2 and October of CY 3. Phase 2 is planned to take approximately one year beginning in February of CY 4 and concluding the following February.. Fieldwork in the reservoir area would start on or about February 25. Installation of the dewatering system is estimated to take one month, with closure of the cofferdams on or about May 31. Fish rescue and drawdown of the reservoir and plunge pool would continue until about June 30. In-stream construction operations would take place from June to December of the CY 2. Placement of the concrete would be completed in prior to commencement of the rainy season. Removal of cofferdams and demobilization of in-stream construction operations would occur from December of year to February of CY 5.

From January to February of CY 5, only minor activities are planned, including joint grouting valve installation and testing, and electrical, instrumentation and controls completion. Joint grouting would begin at least 90 days after each individual section of concrete has been poured and only when any uncontrolled spills have been eliminated. The upper portions of the Dam thickening outside of the spillway would be scheduled for grouting last. In wetter years this would mean final joint grouting could end several months later during the next dry season.

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Figure 3.2-14 SAN CLEMENTE DAM SEISMIC SAFETY EIR/EIS PROJECT
PROPONENT'S PROPOSED PROJECT
CONCEPTUAL SCHEDULE

ID	Task Name	Duration	Start	Finish
1	PERMITTING	320 days	Mon 1/3/05	Fri 3/24/06
2	ENGINEERING DESIGN	390 days	Thu 6/16/05	Wed 12/13/06
3	SH &CRLF MIT MONTORING PHASE 1	118 days	Thu 12/14/06	Mon 5/28/07
4	SH &CRLF MIT MONTORING PHASE 2	216 days	Mon 2/25/08	Mon 12/22/08
5	**PHASE 1**	**210 days**	**Thu 12/14/06**	**Wed 10/3/07**
6	MOBILIZATION	30 days	Thu 12/14/06	Wed 1/24/07
7	ACCESS ROAD UPGRADE	180 days	Thu 1/25/07	Wed 10/3/07
8	PIPELINE ACCESS	25 days	Thu 1/25/07	Wed 2/28/07
9	TRAFFIC CONTROL SECTION	12 days	Thu 3/1/07	Fri 3/16/07
10	LOW ROAD ACCESS	12 days	Mon 3/19/07	Tue 4/3/07
11	HIGH ROAD ACCESS	12 days	Wed 4/4/07	Thu 4/19/07
12	BRIDGE WORK	70 days	Thu 1/25/07	Wed 5/2/07
13	DEMOBILIZATION	15 days	Thu 5/3/07	Wed 5/23/07
14	**PHASE 2**	**262 days**	**Mon 2/25/08**	**Tue 2/24/09**
15	MOBILIZATION	30 days	Mon 2/25/08	Fri 4/4/08
16	INSTALL DEWATERING SYSTEM	30 days	Thu 5/1/08	Wed 6/11/08
17	DEWATERING & CARE OF WATER	127 days	Thu 6/12/08	Fri 12/5/08
18	EXCAVATION AT DAM BASE	30 days	Thu 6/12/08	Wed 7/23/08
19	EXCAVATION AT ABUTMENTS	27 days	Thu 7/24/08	Fri 8/29/08
20	ABUTMENT PROTECTION	52 days	Mon 9/1/08	Tue 11/11/08
21	CONCRETE	104 days	Thu 7/24/08	Tue 12/16/08
22	FISH LADDER	140 days	Thu 6/12/08	Wed 12/24/08
23	BUTLER BUILDING	30 days	Mon 4/7/08	Fri 5/16/08
24	CATWALK	20 days	Wed 11/19/08	Tue 12/16/08
25	DEMOBILIZATION	30 days	Thu 12/25/08	Wed 2/4/09
26	JOINT GROUTING	20 days	Wed 1/28/09	Tue 2/24/09



Project: SAN CLEMENTE THICKENING
Date: Mon 12/10/07

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
External Milestone
Deadline

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Construction Crews

The requirements for labor, which affects the number of vehicle trips to and from the site, vary from an approximate average of 15 workers per day during Phase I (road construction and improvements scheduled for one season for approximately eight months), to an approximate average of 60 workers per day during Phase II (dam rehabilitation and fish ladder construction). A maximum of about 80 workers would be needed during July through October when forming and concrete placement would occur for the Dam and the fish ladder. Construction crews could be transported to work in car pools to minimize construction traffic.

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3.3 ALTERNATIVE 1: DAM NOTCHING

3.3.1 OVERVIEW

This alternative would notch SCD to guard against failure from an MCE and a PMF, as described in Section 3.2. It would meet the need to reduce seismic and PMF safety risks by notching the Dam to approximately elevation 506 feet in the area of the existing spillway bays. Accumulated sediment behind the Dam would be removed down to the level of the notch. Approximately 1.5 million cubic yards (930 AF) of accumulated sediment would be removed from behind the Dam over three seasons by excavation with heavy earthmoving equipment. A conveyor-belt system would be used to transport the sediment to a disposal area east of the reservoir.

The existing fish ladder at SCD would be replaced to accommodate the new spillway and reservoir height. In addition, a notch would be cut into OCRD, which is about 1800 feet downstream of SCD, in order to provide adequate fish passage. The river channel exposed through partial removal of sediment in the historic reservoir inundation zone would be reconstructed.

During the active construction seasons, the Carmel River and San Clemente Creek would be diverted and the reservoir would be dewatered around the reservoir and dam site. CAW's new diversion intake would be installed upstream to replace the existing intake at the Dam to avoid interruption of this source of CAW's water supply. The intake would divert through a separate temporary bypass line around the construction site into CAW's existing system. The permanent transmission line to connect the new diversion intake to the existing transmission line to CVFP would be installed at an appropriate point in the construction process.

This project is expected to take six years to complete, including environmental review, permitting, design, infrastructure improvements, sediment removal, dam notching, and channel reconstruction. The schedule could be affected by the effects of annual precipitation on river flow conditions in the spring. Construction activities necessary to complete the project are summarized below. Improvements to and/or new roads as part of the proposed project are also conceptually described.

3.3.2 PROJECT LOCATION & ACCESS

The project study area, area of potential effect, facilities, and land ownership are described in Section 3.2. Figures 3.2-1 and 3.2-2 depict the project region and vicinity, respectively.

3.3.3 EXISTING STRUCTURE & OPERATIONS

SCD and reservoir associated facilities; dam and reservoir operations, the CVFP, the existing fish ladder, and current provisions for fish passage are described in Section 3.2.

3.3.4 PROJECT CHARACTERISTICS

This section describes the SCD dam notching project, including modification of the CAW water diversion point; electrical system; sediment excavation, transport and disposal; access roads; stream diversion and reservoir drawdown and dewatering; and replacement of the fish ladder. It also summarizes construction activities necessary to complete the project.

Dam Notching

Notching SCD to approximately elevation 506 feet in the area of the existing spillway bays would reduce the pressure on the Dam sufficiently to avoid catastrophic failure of the Dam during a MCE event. Notching to this elevation would also be sufficient to prevent overtopping of the Dam during the PMF. the Dam notching plan and profile is illustrated in Figures 3.3-1 and 3.3-2.

Notching would not proceed until sediment removal is complete (see discussion below). As shown on Figure 3.3-2, the existing spillway piers, gates, catwalk, and the concrete that forms the existing dam directly under the spillway would be removed down to about elevation 503 feet. A new concrete overflow weir would be constructed above the saw-cut surface to provide a hydraulically smooth overflow section with invert elevation at 506 feet. The new concrete would be tied to the existing concrete using reinforcing steel dowels. The new wing walls due to deepening of the spillway will be reinforced for safety if needed. The deepening of the spillway opening and the removal of the intermediate piers would increase the spillway capacity from the existing 20,000 cfs to the PMF peak flow of about 81,000 cfs when the reservoir water surface is at the parapet elevation.

The plunge pool downstream of the Dam would be completely drained prior to dam notching to allow access for construction workers and machinery for notching operations and new fish ladder construction. To keep the plunge pool staging area dry during construction, two cofferdams would be installed as described in Section 3.2

Notching would be accomplished by saw-cutting the concrete in large blocks. Approximately 700 cubic yards of concrete would be removed. A large tower crane would be used to remove the sawcut concrete blocks and to place the new concrete at the Dam and fish ladder. The crane would be located downstream of the Dam in the drained plunge pool to provide adequate access to the Dam and fish ladder. The concrete blocks would then be further broken up into pieces of sizes that could be loaded and transported by off-highway trucks to the sediment disposal pile for use in erosion control. A large excavator equipped with a hydraulic hammer would be used to reduce the size of the concrete blocks as needed. Light blasting may also be used to break up the largest concrete pieces into smaller, more manageable pieces.

DEMOLISH EXISTING FISH LADDER AND CONSTRUCT NEW FISH LADDER (SEE NOTE 4)

U/S

ELEV	RADIUS	
535'	135'	
525'	133'	3.00'
515'	131'	2.50'
505'	129'	2.50'
495'	127'	3.50'
485'	123'	5.25'
475'	118'	6.25'
465'	112'	7.25'
455'	104'	10.50'
445'	95'	11.50'

N 2,053,138.71
E 5,765,035.62
EL. 535.0

28" WATER SUPPLY PIPE TO FILTER PLANT

QUONSET HUT

LEFT ABUTMENT

6' CHAIN LINK FENCE

FISH LADDER

℄ OF FISH LADDER OPENING

59°54'

R=131' TO STATIONING CONTROL LINE

BASELINE FOR ORIGINAL CONSTRUCTION N 12°55'37.20"E

CARMEL RIVER

METAL GRATE WALK

RIGHT ABUTMENT

CONCRETE LANDING

VALVE HOUSE

℄ 12" BLOWOFF VALVE

ABANDONED 24" SLUICE VALVES

AIR COMPRESSOR BUILDING

PLUNGE POOL NORMAL TAILWATER EL 525

INTAKE BUILDING

BEGIN SPILLWAY STA. 5+75.29

END SPILLWAY STA 4+24.71

PROPOSED NOTCHING SURFACE AT EL. 506

SAN CLEMENTE RESERVOIR

NOTES:

1. CONTOURS WITHIN RESERVOIR AND PLUNGE POOL ARE FROM ORIGINAL 1920 PLANS. SEDIMENT IN RESERVOIR AND EROSION IN PLUNGE POOL HAVE CHANGED THESE ELEVATIONS.
2. STATIONING ALONG DAM CREST REFLECTS NEW STATIONING LAYOUT. NEW STATION 5+00 IS AT SAME LOCATION AS 1920 STATION 15+0.
3. REFER TO REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION ON ORIGINAL DAM CONSTRUCTION.
4. NEW FISH LADDER FOR DAM NOTCHING ALTERNATIVE TO BE SIMILAR DESIGN AS FOR DAM THICKENING ALTERNATIVE EXCEPT 19 FT LESS IN HEIGHT

PLAN

0 10 20 30

SCALE IN FEET

SOURCE : Woodward-Clyde International (11/98)

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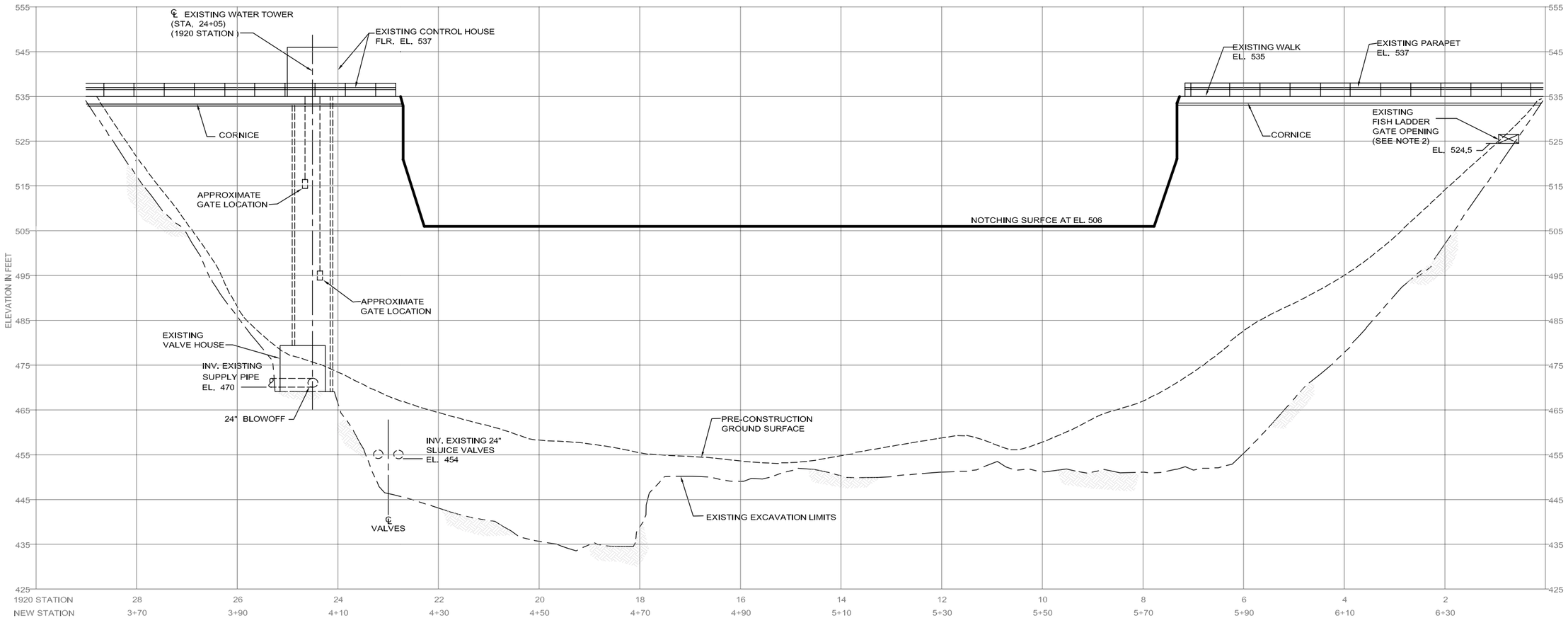
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MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
PLAN OF DAM NOTCHING

Figure 3.3-1



PROFILE ALONG VERTICAL PROJECTION
OF DOWNSTREAM ARC OF EL. 535
(LOOKING UPSTREAM)

0 10 20 30
SCALE IN FEET

NOTES:

1. ALL INFORMATION WAS GENERATED FROM ORIGINAL DRAWINGS DATED AUGUST 31, 1920.
2. NEW FISH LADDER FOR DAM NOTCHING ALTERNATIVE TO BE SIMILAR IN DESIGN AS FOR DAM THICKENING ALTERNATIVE, EXCEPT 19 FT LESS IN HEIGHT.

SOURCE : Woodward-Clyde International (11/98)

REV	DATE	BY	DESCRIPTION

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MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER
SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
DAM NOTCHING PROFILE

Figure 3.3-2

Modification of Low-Level Outlet Works and CAW Water Diversion Point

The existing low-level outlet works are described in Section 3.2.

Current CAW infrastructure and operations depend upon a water surface elevation of 525 feet at the point of diversion at San Clemente Reservoir (The Dam's low-level outlet works) to provide the required hydraulic head in the conveyance pipeline between the Dam and the downstream filter plant, to drive the water through the existing filters to the clearwell for distribution. The clearwell provides the hydraulic head for distributing the treated water into the distribution system. Therefore, the point of diversion would need to be replaced at a 525-foot elevation to avoid extensive improvements to the existing filter plant. The maximum anticipated rate of diversion is 16 cfs, although summer diversions are not expected to exceed 3 to 4 cfs. The existing intake at the Dam could not be used for the notching alternative because the 19-foot loss in reservoir height would not meet minimum head requirements.

Based on cost and operational considerations, a subsurface screened intake at the head of San Clemente Reservoir was tentatively selected as the new water diversion point for the Dam notching alternative. This option, similar to a Ranney intake system, would consist of a network of 12-inch diameter stainless-steel perforated pipes embedded in the gravels and cobbles that line the river bottom. The intake pipes would discharge to a common manifold and to a conveyance pipeline. Based on the longitudinal profile of the Carmel Branch developed by MEI (MEI 2003), the screened intake would need to be constructed and maintained approximately 6,000 to 6,500 feet upstream of the Dam in order to provide a diversion at an elevation of 525 feet. The exact location of the intake would need to be determined in the field in conjunction with sediment removal operations. CAW's new diversion intake would be installed upstream to replace the existing intake at the Dam to avoid interruption of this source of CAW's water supply. During the construction phase, the intake would divert through a separate temporary bypass line around the construction site into CAW's existing system. The existing 30-inch-diameter steel conveyance pipeline would be extended from its current end at the Dam site to the location of the new intake. This permanent transmission line to connect the new diversion intake to the existing transmission line to CVFP would be installed at an appropriate point in the construction process.

The approximate location of the new screened intake and anticipated alignment of the pipeline extension are shown on Figure 3.3-3. The new pipeline would connect to the existing 30-inch pipeline at the downstream toe of the Dam, just upstream of the existing control valves. The existing wye branch, dam outlet valves, and building would be abandoned. Control of flow would be from the filter plant.

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ACCESS ROAD TO SITE 4R
(EXISTING JEEP TRAIL TO BE IMPROVED)

SEDIMENT DISPOSAL
SITE 4R

TWO-WAY TRUCK, CONVEYOR,
AND SLURRY PIPELINE ROUTE

EXISITNG 30-INCH DIAMETER
DIVERSION PIPELINE

TENTATIVE STOCKPILE AREA

30-INCH DIAMETER DIVERSION PIPELINE
EXTENSION ALONG RIGHT BANK OF RIVER
CHANNEL TO NEW DIVERSION POINT

RIVER WATER INTAKE SYSTEM
(RANNEY INTAKE)

0 1000 2000
FEET

REV	DATE	BY	DESCRIPTION

SCALE

WARNING
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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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Walnut Creek
California

CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
PLAN OF SEDIMENT DISPOSAL SITE 4R

Figure 3.3-3

XREF: BDR
FILE: C:\Documents and Settings\bashar sudah\Desktop\Site 4 and 6 - Plan_rev 6-20-07.dwg USER: Bashar Sudah Jun 21, 2007 9:03am Job No: 1004231

High-Level Outlet

A high-level outlet equipped with a sluice gate would be installed during the proposed dam notching in order to provide the ability to make controlled and limited maintenance sediment releases to maintain upstream passage to the fish ladder exit. The sluice gate would be operated as described in Section 3.2. The outlet would be positioned in the left (west) part of the Dam, near the fish ladder exit and below the level of the new spillway crest. The exact location of the outlet would be determined in conjunction with the final design of the fish ladder, following the criteria stated in Section 3.2.

The outlet would be constructed by excavating an oversize conduit through the concrete of the existing dam, placing an inner steel liner in the conduit. Construction details for the outlet and trashrack would be similar to those described in Section 3.2. Minor sediment excavation to allow installation of the gate and trashrack would be accomplished as part of sediment removal operations during the final season of sediment excavation in the reservoir.

Electrical System

The existing electrical service to SCD is supplied by PG&E via an existing 60-kV transmission line from the Laureles substation in Carmel Valley. The 60-kV line follows San Clemente Drive to the High Road intersection, continuing west from that point away from the Project Area. A 12-kV 3-phase pole line branches from the Sleepy Hollow intersection to provide power to SCD, terminating outside an onsite structure above the left abutment of the Dam. Pole mounted transformers provide 3-phase service to the Dam and a nearby CAW-owned residence.

Power requirements for this alternative are governed by the power needs for the conveyor system. The sediment would be transported via connected conveyor segments with 75- to 200-horsepower (HP) (100- to 350-kilowatt [kW]) motors at each segment. Motor load is estimated to total 1,850 HP on an operating basis. Dewatering requirements, construction office trailers, equipment maintenance shop, and night lighting would impose smaller additional loads. Preliminary discussions with PG&E indicate that the configuration of the existing PG&E 60-kV and 12-kV power lines would not be able to handle the total load demand and supply the needed power. Based on preliminary power system evaluations, the most efficient way of supplying the needed power may be to use one or more diesel-power generator sets. A combined capacity of two megawatts would be sufficient to meet project electrical needs. The diesel generator would be comparable to a CAT 3608 TA turbocharged and after-cooled unit, with capacity of 2,000 kW, run in a primary mode (full-time) and equipped with a secondary reduction catalytic device and an add-on particulate filter to meet local air quality requirements.

Sediment Excavation, Transport and Disposal

Accumulated sediment behind the Dam would be removed down to the level of the notch. San Clemente Reservoir has been estimated to contain approximately 2.5 million

cubic yards of sediment (MEI 2003). The sediment consists of sandy gravel, gravelly sand, sand, silty sand, and sandy silt. The finer-grained sediment is located nearest to the Dam in both the Carmel River and San Clemente Creek arms of the reservoir. The coarser (more gravelly and cobbly) materials are encountered in the upper reaches of the Carmel River arm. Previous sediment transport modeling studies determined that removing or notching the Dam and letting the river flush the sediments downstream in an uncontrolled manner would pose unacceptable risks for sediment accumulation and flooding in downstream reaches of the river. To mitigate these risks, notching of the Dam requires the prior removal of the sediment accumulated in the reservoir to a depth (near the Dam) that coincides with the new spillway elevation. Based on recent studies (MEI 2005), the volume of sediment removal would be approximately 1.5 million cubic yards. As a result of the sediment removal efforts, the upstream reaches of the original (pre-1921) Carmel River and San Clemente Creek stream channels would be exposed and require reconstruction.

Several excavation methods (mechanical excavation and hydraulic dredging) are considered feasible (see Appendix G for more detail). Mechanical excavation and transport by conveyor appear to have a slight cost advantage, are simpler, and would have lesser environmental impacts than other methods. The selected approach is described in more detail below.

Sediment Excavation

The sediment would be removed in planes approximately parallel to the existing surface of the sediment in the reservoir. This approach would minimize the amount of sediment movement in the winter. In combination with reservoir dewatering and sediment pre-draining activities described below, it would also help maintain the excavation work above the groundwater level for as long as possible. A portion of the original streambed that existed in 1921 would be exposed in the upper reaches of the Carmel River and San Clemente Creek during the second season of sediment removal operations.

Excavation of sediment above the water table would be performed using self-loading scrapers or similar self-propelled excavating equipment. The scrapers would transport the material to a central stockpile area within the reservoir area, where the material would be allowed to drain further. The stockpile area would be located at the mouth of the ravine where the sediment disposal site is located. The tentative stockpile site, called Site 4R, is shown on Figure 3.3-3.

Sediment Transport

The excavated sediment would be transported to a central stockpile in the reservoir near the mouth of the ravine where Site 4R is located. From the stockpile, a gravity-feed reclaim tunnel system would be used to feed the sediment to a 3,500-foot-long, 36-inch overland belt-conveyor system that would transport the sediment to the site. Gravity feed reclaim tunnel systems are used typically used in mining applications, and consist of a buried hopper (box structure with opening at the top) underneath the excavated

sediment stockpile that collects and deposits sediments onto the conveyor system, a tunnel structure (similar to a half round culvert) that protects the conveyor leading to the hopper, and the conveyor equipment.

The conveyor system would possess a peak capacity of 700 cubic yards per hour. An average sustained rate of 500 cubic yards per hour is assumed for purposes of calculating seasonal production. The belt conveyor would be installed along a 25-foot-wide access road linking the reservoir and the disposal site. The road would be used for access to the reservoir and operation and maintenance of the conveyor. The approximate route and profile of the road and conveyor is shown in Figure 3.3-4. At the disposal site, a traveling radial stacker conveyor would be used to discharge and spread the sediment across the disposal area in preparation for compaction.

Sediment Disposal

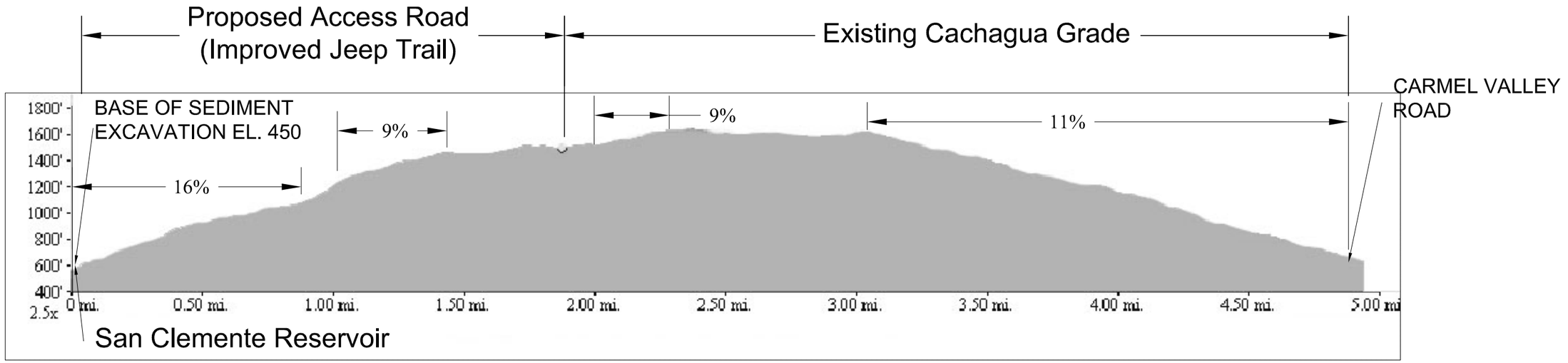
Sediment disposal for this alternative would be at Site 4R, located in a relatively steep, undeveloped, forested ravine approximately 3,500 feet east of San Clemente Reservoir. The ravine supports an ephemeral stream that carries local runoff during storm events. Existing access to the ravine is via a Jeep Trail that begins at the Cachagua Grade. The Jeep Trail would need to be improved significantly to enable the mobilization of construction equipment to the site and the reservoir (see discussion below).

A plan of Site 4R and a capacity curve for the site is shown in Figure 3.3-5. The maximum capacity of the site is undetermined but is well in excess of the estimated required volume of 1.5 million cubic yards (ample capacity to store all sediment excavated under this alternative). The toe of the sediment pile would be located at approximate elevation 920 feet. The top of the sediment pile would be at about elevation 1,110 feet in order to contain all of the sediment accumulated in the reservoir. The footprint area of the sediment pile would be approximately 16 acres. The watershed area tributary to the sediment pile site is approximately 252 acres.

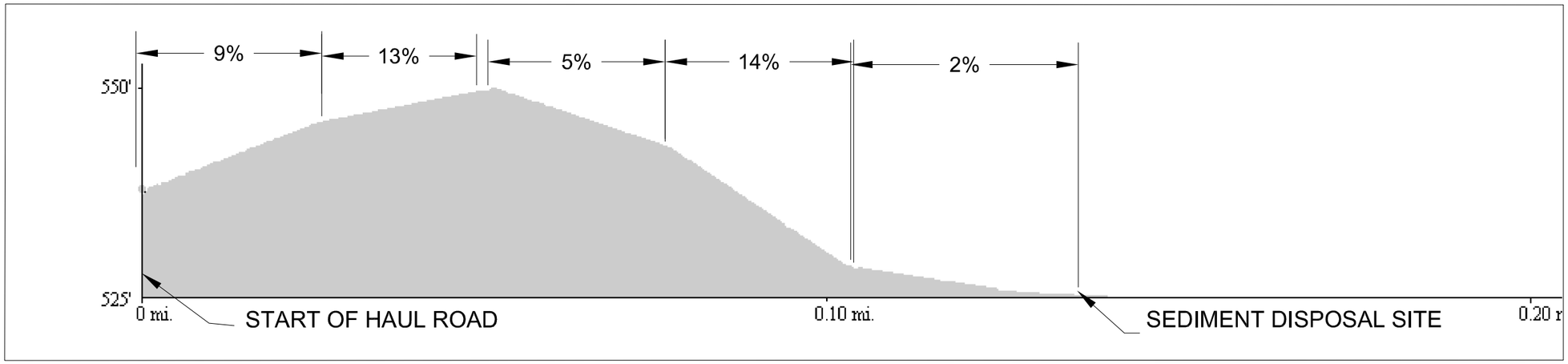
The property where Site 4R is located is owned by the Monterey Peninsula Regional Park District (MPRPD). The use of Site 4R as sediment disposal site and access easements would need to be negotiated with the MPRPD.

Site preparation prior to sediment disposal would include (1) the clearing and grubbing of trees and vegetation from the sediment pile footprint, (2) the removal of any existing facilities (none have been identified), and (3) the stripping and stockpiling of organic soils for use in subsequent restoration and revegetation of the site once sediment placement has been completed. In addition, a culvert pipe would likely be placed along the ravine bottom the full length of the site to help manage storm waters and minimize erosion during construction operations. BMPs identified in the SWPPP (Appendix K) would be implemented for site preparation.

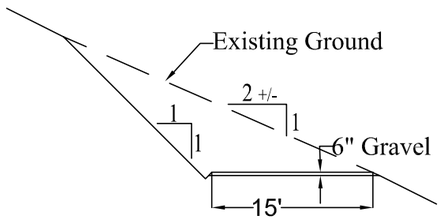
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PROFILE OF ACCESS ROAD TO RESERVOIR SITE



PROFILE OF HAUL ROAD



TYPICAL ACCESS ROAD SECTION

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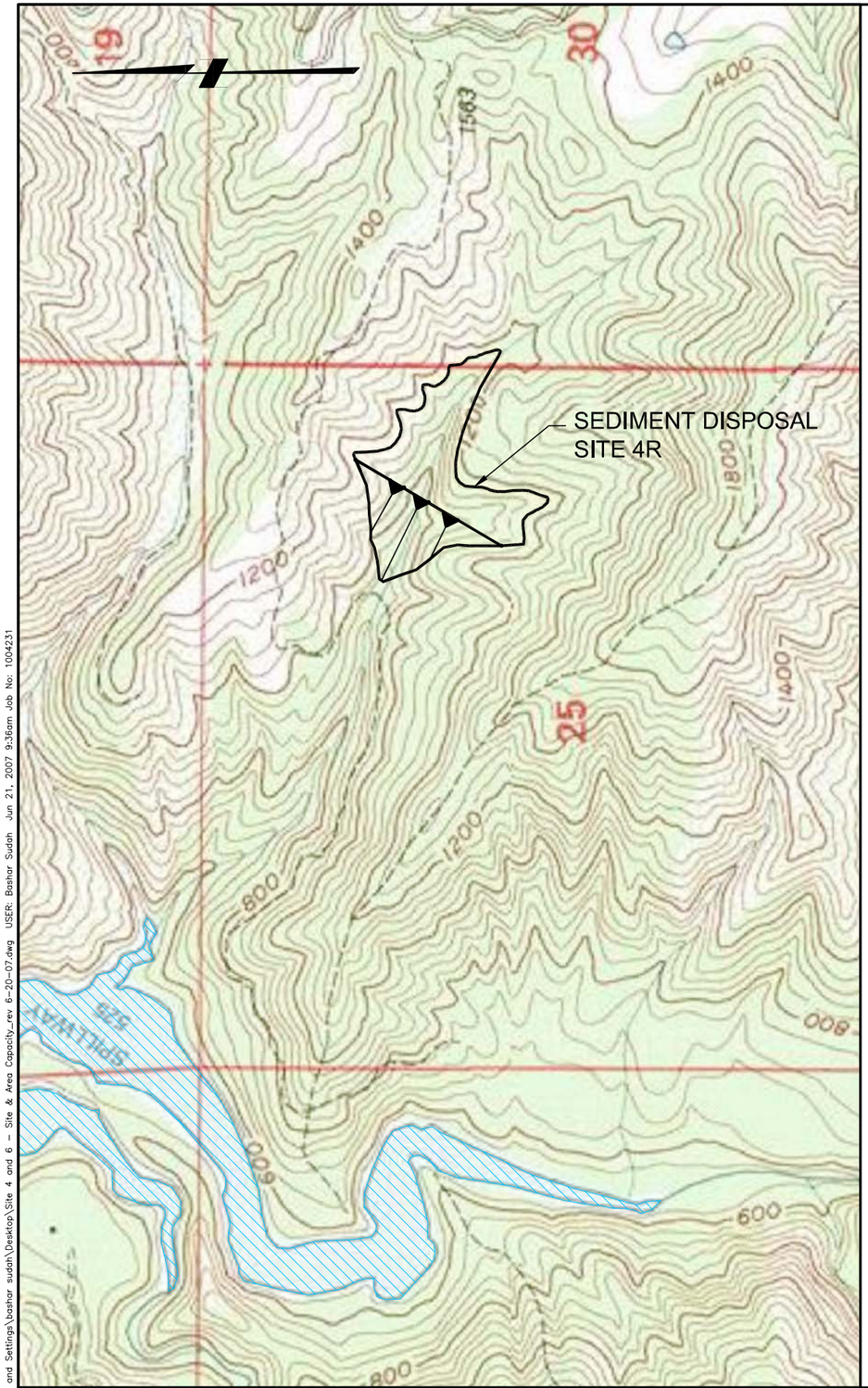
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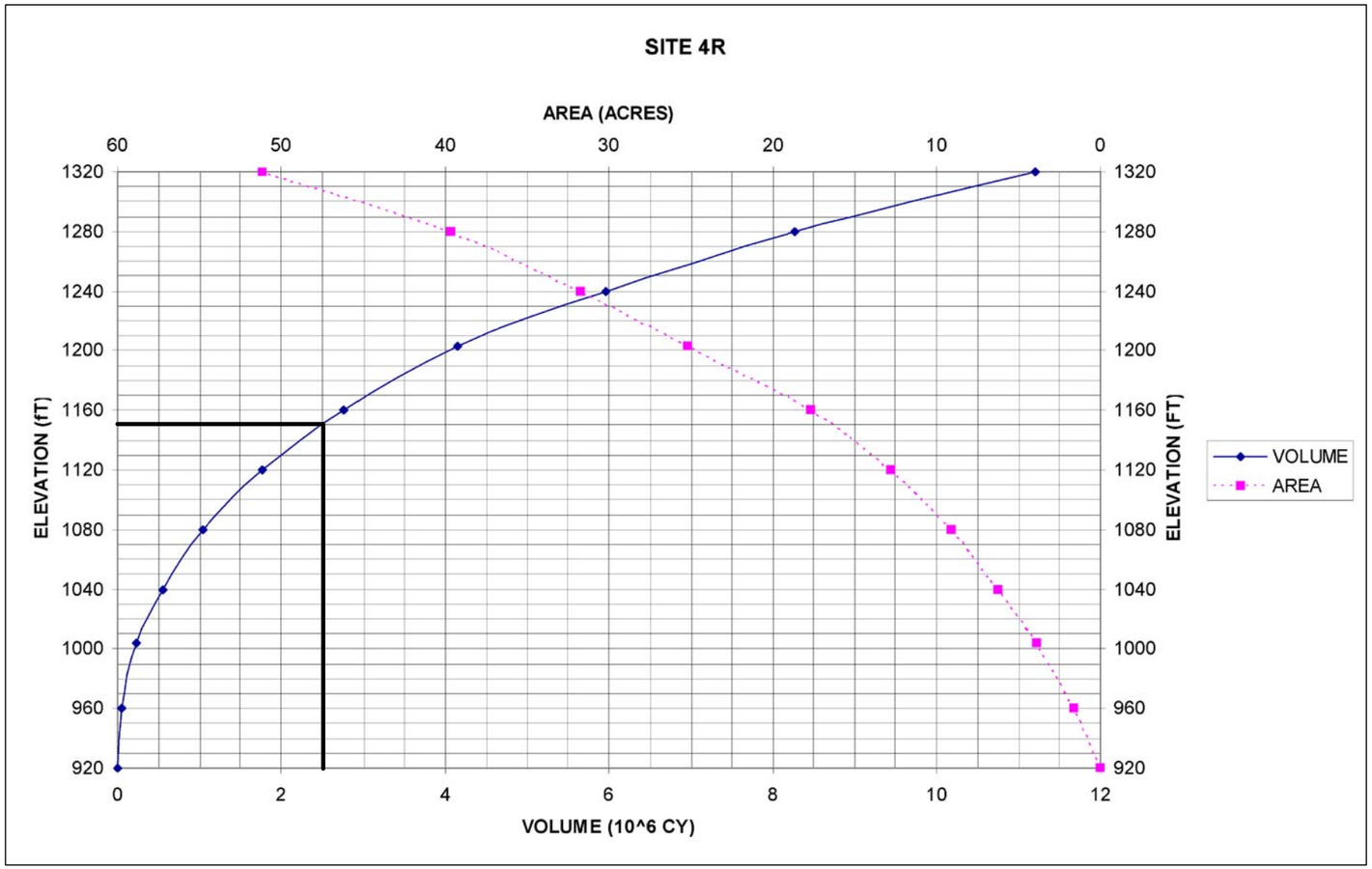
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Walnut Creek
California

CALIFORNIA AMERICAN WATER
SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
PROFILES OF SITE ACCESS AND HAUL ROADS

Figure 3.6-4

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Walnut Creek
California

CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
AREA–CAPACITY CURVES OF SEDIMENT DISPOSAL SITE 4R

Figure 3.3-5

Bulldozers would be used to spread sediment into thin, nearly horizontal lifts. Each lift would be compacted using the bulldozers or vibratory compactors. The sediment pile would be constructed with a stable side slope (averaging 2.75:1). Concrete debris from dam notching could be placed on the pile for long-term erosion protection at the toe of the pile and on the groins along the contact between the pile and the hillside abutments.

At the end of each construction season, the site would be winterized by: (1) providing interim drainage and diversion of ravine flows, (2) stabilizing sloping sediment surfaces and other disturbed areas by installing erosion protection features such as erosion control mats or straw mulch and wattles, and (3) providing sediment collection features such as silt fences, straw bales, and sediment traps along the toe of the pile and other disturbed areas.

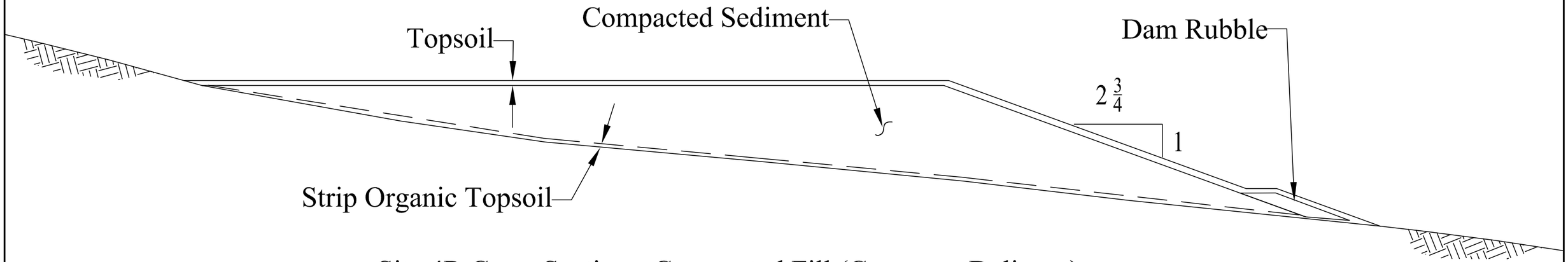
Once placement of sediment and concrete debris has been completed, the topsoil from the temporary topsoil stockpile set aside during site stripping would be spread over the sediment pile. The graded surface would be stabilized with erosion control measures as described above and revegetated with native plants and trees obtained from the site vicinity. A typical section for the sediment pile is shown in Figure 3.3-6.

Stream Diversion and Reservoir Drawdown and Dewatering

Both the Carmel River and the San Clemente Creek would be diverted around the active areas of sediment excavation during the construction season. Stream flows would be passed downstream to maintain the flow and habitat in the Carmel River during construction. Within the reservoir area, the reservoir level would be drawn down, and the sediment deposits would be pre-drained to keep the active excavation area as dewatered and drained as possible to enable operation of scrapers and similar self-propelled earthmoving equipment.

A construction requirement for reservoir drawdown constrains the main construction activities to a period when streamflow is low enough to be passed through a bypass pipeline and the Dam outlet works. The target streamflow to divert the Carmel River is assumed to be a flow of about 50 cubic feet per second (cfs) or less. A diversion facility, consisting of an interlocking sheetpile cofferdam, would be installed in the channel at the upper end of the reservoir to divert incoming flows from the Carmel River through a 36-inch-diameter bypass pipeline. The sheetpiles would be driven down through the sediment to bedrock. The upper end of the sheetpiles would extend about five feet above the existing streambed to develop sufficient head at the bypass pipe intake. A removable section would be disassembled annually to allow stream and fish passage during non-construction periods.

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Site 4R Cross Section - Compacted Fill (Conveyor Delivery)

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MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER
SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
SEDIMENT DISPOSAL SITE 4R CROSS SECTION

Figure 3.3-6

Another sheetpile cofferdam would be constructed across San Clemente Creek to divert it into an 18-inch pipeline. These bypass pipelines would convey the stream flows to some of the existing drawdown ports at SCD and/or to the existing mid-level intake (which may be sealed to keep out turbid water). Water passed through the drawdown ports would discharge to the existing plunge pool downstream of the Dam. Water discharged through the mid-level intake would continue through the existing 30-inch-diameter pipeline approximately 500 feet downstream of the Dam to an energy dissipation structure where the water would be released to the Carmel River bed. During the construction season most of this bypass flow will be released from Los Padres Reservoir upstream.

Prior to commencing excavation, the reservoir would be drawn down below the level of the drawdown ports, if possible, by using the existing mid-level intake structure with gate invert at elevation 494 feet. The reservoir water surface first would be drawn down by gravity to the invert of the drawdown ports at elevation 515 feet and then further lowered to the lowest level possible, approximately elevation 495 feet. However, sediment has accumulated against the upstream face of the Dam to about elevation 510 feet. This sediment deposited at the mid-level intake structure (at elevation 494 feet) would need to be removed to draw the reservoir water below elevation 515 feet. A sheetpile barrier would be installed around the intake. The sediment between the sheetpile barrier and the Dam intake would be removed. After the turbidity has cleared, the reservoir would be lowered to elevation 495 feet. Alternatively, water could be pumped from the deepest part of the reservoir near the central part of the Dam and discharged to the river either by pumping into the outlet works or the drawdown ports.

Reservoir drawdown and sediment excavation operations would be managed to promote pre-drainage of the sediments ahead of the excavation. As the level of the sediment is lowered, drainage trenches would be excavated to drain to low points, from where water would be removed. Water originating from local precipitation, springs, and/or seepage through the stream diversion structures may seep into the construction area, bounded upstream by the diversion structures and downstream by the Dam. This excess water would also need to be drained, conveyed, collected and removed from the excavation. In addition to drainage trenches, well points may be installed within the sediment deposits, as necessary to help capture leakage water and maintain the water surface in the reservoir at the desired level, i.e., below the bottom of the excavation.

Water within the construction area would be turbid due to the earthmoving operations. The remaining pond adjacent to the Dam would be used as a desilting basin during the construction season. At some point the turbidity of the water in the reservoir may be too high for directly releasing it downstream. Excess water from within the reservoir would then need to be treated using a filtration system to remove turbidity and excess iron compounds. The treated water would be discharged to the river.

At the end of the first sediment excavation season, the initial storms that exceed the diversion capacity would fill the reservoir, after which time the diversion pipe would be

disconnected from the sheetpile cutoff and the river flow would be re-established through the reservoir.

For the second sediment excavation season, before re-starting the sediment excavation operation, the water level in the reservoir would need to be drawn down again as described above.

Exact locations of the diversion cutoff walls and pipelines, drainage trenches and well points would depend on the actual sediment level when construction begins, and will be field determined at that time.

3.3.5 PROJECT ACCESS AND IMPROVEMENTS

Existing vehicle access to SCD and the filter plant from Carmel Valley Road is described in Section 3.2. Improvements to these existing access roads are also described in Section 3.2.

Access to Sediment Disposal Site and Reservoir

Road access to the sediment disposal site and San Clemente Reservoir would be established via Cachagua Grade. An existing Jeep Trail that extends between a gated entrance off Cachagua Grade and the sediment disposal site would be improved, and a conveyor-belt system would be installed between the reservoir and the sediment disposal site.

The primary access used to develop the sediment disposal site and access the reservoir would be via Carmel Valley Road and Cachagua Grade. An existing dirt road leads to the sediment disposal site, entering off Cachagua Grade approximately three miles from the intersection with Carmel Valley Road. A locked steel swing gate controls the entrance. "Truck Crossing — 500 Feet" signs would likely be necessary on both Cachagua Grade approaches. Asphalt pavement would be placed at the intersection to protect the Cachagua Grade edge of pavement and to reduce dust at the intersection.

About 1.5 miles of this existing dirt road (from the intersection with Cachagua Grade to the sediment disposal site) would need to be improved to allow access of construction personnel and equipment. Improvement of the existing road would consist of widening the road to a width of 20 feet (minimum width of 15 feet with turnouts for passing in tight reaches), improving the radius of curvature at sharper curves to allow passage of large trucks, and constructing a drainage ditch along the uphill edge of the road. The road surface would have 6 inches of Class II base rock installed. A double chip seal coat would be placed as a minimum wearing surface. Fifteen-inch-diameter or larger culverts with inlet structures would be installed at approximately 400-foot intervals for drainage. The Jeep Trail would be left in its improved condition. No additional maintenance would be required on the Jeep Trail than already exists.

A new 0.5-mile-long access road would be constructed from the disposal site to the reservoir. A typical cross-section is shown on Figure 3.3-5. The road would be excavated along the slope of the ravine and would consist of a 25-foot-wide surface and 3-foot drainage ditch. The excavated slope above the road would be stabilized with small anchors, wire mesh and shotcrete as needed. The road surface would have 6 inches of Class II base rock installed. The belt conveyor would be installed along the outside edge of the road and would be accessible to maintenance equipment operating from the road. The road's travel surface would be sealed with a double chip seal coat. Fifteen-inch diameter or larger culverts with inlet structures would be installed at approximately 400-foot intervals for drainage. This road would be restored to pre-construction conditions after completion of the project.

3.3.6 FISH PASSAGE

Old Carmel River Dam Fish Ladder Improvements

Fish passage improvements to the OCRD are the same as are described for the Dam strengthening project in Section 3.2.

San Clemente Dam Fish Ladder Replacement

The existing fish ladder is described in Section 3.2. The ladder would be demolished after the migration season ends (June) to make way for grading and framing a new ladder. The new ladder would be poured and finished by late summer/fall in time for fish to use it in the next migration season.

The design of the replacement fish ladder would be substantially the same as shown in Section 3.2 (Figure 3.2-12), except shorter. The proposed ladder entrance is located on the left bank (looking downstream) of the plunge pool, near the location of the existing ladder entrance. The proposed ladder exit is located on the left abutment, ascending approximately 49 feet from the pool below. The transportation channel of the proposed ladder would be comprised of 49 pools, each having typical dimensions of 10 feet long by 8 feet wide, resulting in an average slope of 10 percent and a total length of 540 feet (including entrance, outlet and resting pools). The proposed layout divides the transportation channel into four segments, each connected by a switchback that also serves as a resting pool.

The conceptual fish ladder hydraulic operating conditions are summarized as follows. For stream flows up to 55 cfs, all flow would pass through the proposed ladder. For stream flows in the range of approximately 55 to 115 cfs, most of the flow (55 to 62 cfs) would pass through the proposed ladder. The remaining flow would discharge over the spillway (at elevation 506.0 feet). The high flow fish passage condition of 773 cfs is expected to occur at approximate reservoir elevation 507.3 feet. At this elevation, approximately 65 to 70 cfs would pass through the proposed ladder, while just over 700 cfs would pass over the spillway. At the low flow fish passage condition of 15 cfs, there would be approximately 2 feet of water depth in the vertical slot above the 12-inch slot, resulting in a pool depth of about 3 feet.

The proposed ladder would be equipped with baffle walls at 10-foot intervals that create 49 standard pools within the transportation channel. Each baffle wall would have a 15-inch-wide vertical slot that extends the full height of the channel, except for a 12-inch-sill located at the bottom of the slot. At 70 cfs flow, the water depth would be approximately 8.5 feet above the top of the sill, and there would be a consistent velocity of approximately 6.6 feet per second through the slot regardless of depth. A total ladder depth of 12 feet (including the 1-foot sill) would give the ladder a maximum capacity of approximately 90 cfs. The entire ladder would be covered with grillage to prevent fish from jumping out of the ladder, as well as to exclude falling rock from entering the ladder.

The entrance pool for the proposed ladder (located in the plunge pool) would be designed to provide a minimum of 3 feet water depth under low flow conditions. Given the estimated low water surface at Elevation 457 feet, the entrance pool would have an estimated floor at Elevation 454 feet.

The existing ladder exit orifice (at the upstream face of the Dam) would be lowered in a manner consistent with the overall lowering of the reservoir surface. In addition, the exit orifice would be located to achieve proposed hydraulic operating conditions in which all stream flow up to 55 cfs would be routed through the ladder. The existing orifice is 4 feet wide by 2 feet high with invert at elevation 524.5 feet. The proposed ladder exit would lower the invert to Elevation 499.0 feet and would provide a 2-foot wide slot that is 8.5 feet high. The ladder exit would be equipped with a trash rack on the upstream face of the Dam, and it would have a bulkhead closure to allow ladder closure for maintenance or for protection under extreme high flow conditions.

Dredging may be used to establish a fish passage channel prior to the beginning of each migration season

Reservoir Maintenance

Maintenance of the river channel through the reservoir upstream of the fish ladder exit would be the same as described in Section 3.2 for the Proponent's Proposed Project.

3.3.7 PARTIAL RECONSTRUCTION OF THE RIVER CHANNEL AND REVEGETATION OF THE VALLEY FLOOR

Excavation under this alternative would lower the surface of the sediment deposits in San Clemente Reservoir by approximately 19 feet. The new sediment surface in the reservoir would be at about the same grade as the current sediment surface. The partial removal of the reservoir sediment would expose a portion of the pre-1921 alluvial deposits in the river channel and floodplain along the sides and the upstream reaches of the historic reservoir inundation zone, uncovering approximately 2,000 feet of the upstream portion of the Carmel River branch and 900 feet of the San Clemente Creek branch in the current reservoir inundation area.

After the sediment surface is lowered to its planned depth, the following three-stage channel would be provided through selective contouring along both the Carmel River and San Clemente Creek:

- The relatively wide river/creek valley formed by the remaining alluvial deposits;
- A bankfull channel appropriately sized with capacity for a two-year flood event;
- A thalweg (low-flow channel) to pass median annual flows and provide depths needed for fish migration even during low flows.

The broad valley containing the reconstructed stream channel would generally follow the 1921 contours in the upper reaches of the Carmel River and San Clemente Creek and the lowered sediment surface in the portions of the reservoir closer to the Dam. The bankfull and thalweg channels would be reconstructed by limited grading of the existing alluvial deposits. Habitat complexity would be promoted within the channel by constructing pools, runs, and riffles, to provide suitable depth and velocity conditions for steelhead migration. Instream structures such as downed trees and boulders would be placed at strategic locations to improve conditions along the stream channels.

Stabilization of exposed land would be accelerated by planting the exposed reservoir canyon slopes with native upland vegetation. Likewise, once the channel has been contoured, the establishment of riparian vegetation on the lowered sediment terraces would be accelerated through cultivation and planting of selected areas of the valley floor. Native saplings of suitable riparian species would be obtained from nearby reaches of the Carmel River and San Clemente Creek and planted at appropriate densities along the stream banks. Temporary stabilization of stream banks would also be provided using vegetative matter and plantings.

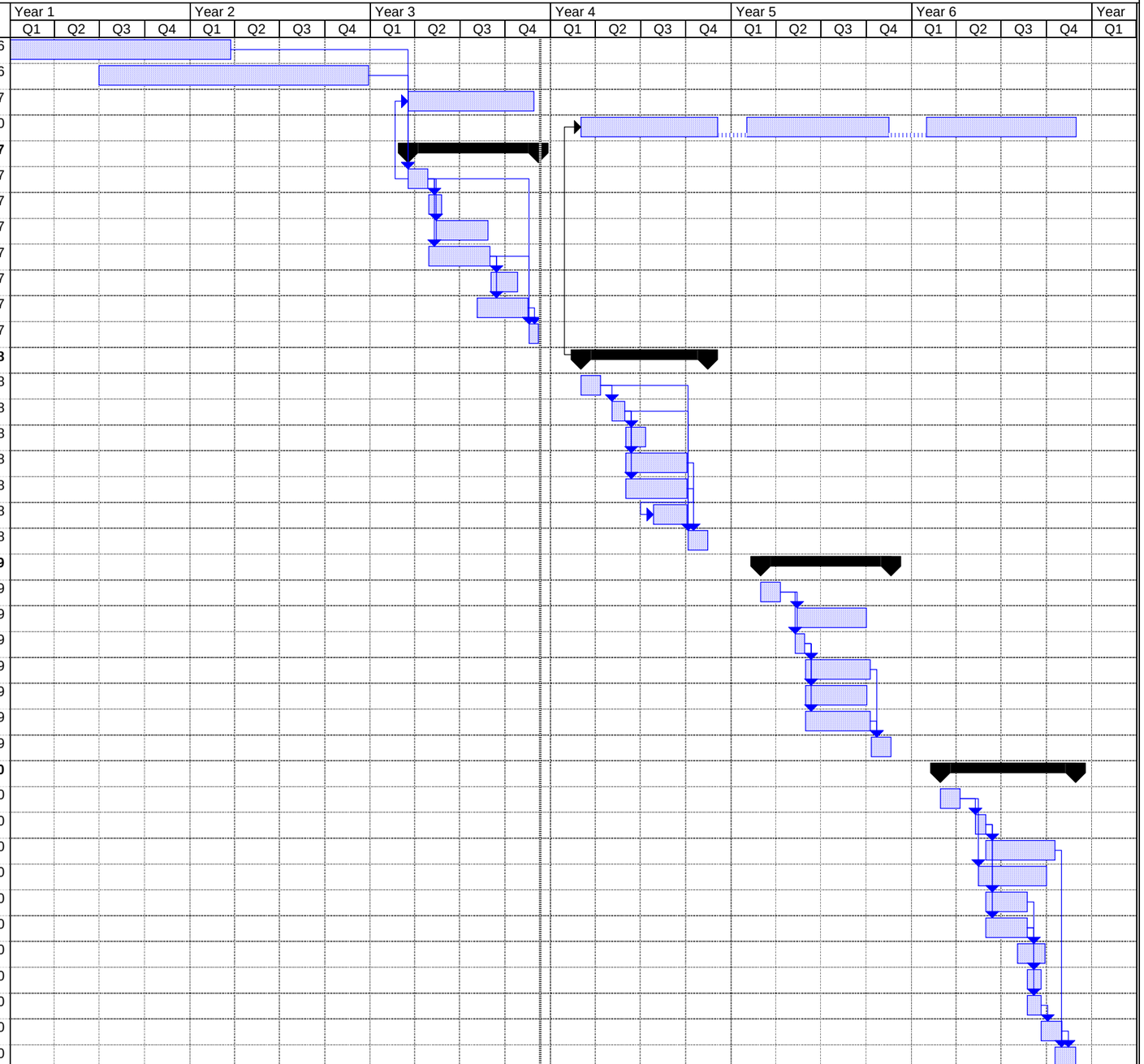
3.3.8 CONSTRUCTION SCHEDULE AND OPERATIONS

A conceptual schedule is presented in Figure 3.3-7. Following the state NOD and federal ROD, final engineering studies would begin in Year 2. These include geotechnical investigations for the sediment site and access roads; design of the access roads and conveyor system; design of the sediment pile including stability and hydrologic analyses; design of the new fish ladder and high-level outlet; design of the new water intake and conveyance pipeline extension; design of the Dam notching; planning and design of stream bypass and dewatering facilities; design of the reconstruction of the Carmel River and San Clemente Creek channels; and design of mitigation or habitat enhancement plans for red-legged frogs and steelhead. A construction contract package is planned to be developed and construction bids solicited late in CY 1, for award in early in CY 2.

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Figure 3.3-7 SAN CLEMENTE DAM SEISMIC SAFETY EIR/EIS PROJECT
ALTERNATIVE 1- DAM NOTCHING
CONCEPTUAL SCHEDULE

ID	Task Name	Duration	Start	Finish
1	PERMITTING	320 days	Mon 1/3/05	Fri 3/24/06
2	ENGINEERING DESIGN	390 days	Fri 7/1/05	Thu 12/28/06
3	SH &CRLF MIT MONTORING PHASE 1	183 days	Mon 3/19/07	Wed 11/28/07
4	SH &CRLF MIT MONTORING PHASE 2	622 days	Mon 3/3/08	Tue 11/30/10
5	**PHASE 1 - PRE-CONSTRUCTION ACTIVITIES**	**190 days**	**Mon 3/19/07**	**Fri 12/7/07**
6	MOBILIZATION	30 days	Mon 3/19/07	Fri 4/27/07
7	SET-UP STREAM DIVERSION	20 days	Mon 4/30/07	Fri 5/25/07
8	INSTALL CAL-AM'S WATER DIVERSION INTAKE AND PIPELINE	75 days	Tue 5/15/07	Mon 8/27/07
9	CACHAGUA GRADE TO RESERVOIR ACCESS ROAD UPGRADE	90 days	Mon 4/30/07	Fri 8/31/07
10	DISPOSAL & RESERVOIR LOADING AREA SITE PREPARATION	40 days	Mon 9/3/07	Fri 10/26/07
11	CONVEYOR FOUNDATIONS, POWER, AND ERECTION	75 days	Mon 8/6/07	Fri 11/16/07
12	DEMOBILIZATION / WINTERIZATION	15 days	Mon 11/19/07	Fri 12/7/07
13	**PHASE 2 - SEDIMENT REMOVAL (SEASON 1)**	**185 days**	**Mon 3/3/08**	**Fri 11/14/08**
14	MOBILIZATION	30 days	Mon 3/3/08	Fri 4/11/08
15	FINALIZE STREAM DIVERSION / INSTALL DEWATERING SYSTEM	20 days	Mon 5/5/08	Fri 5/30/08
16	LOW ROAD & PLUNGE POOL ACCESS ROAD IMPROVEMENTS	30 days	Mon 6/2/08	Fri 7/11/08
17	DEWATERING & CARE OF WATER	90 days	Mon 6/2/08	Fri 10/3/08
18	SEDIMENT EXCAVATION AND DISPOSAL	90 days	Mon 6/2/08	Fri 10/3/08
19	RIVER RESTORATION	50 days	Mon 7/28/08	Fri 10/3/08
20	DEMOBILIZATION / WINTERIZATION	30 days	Mon 10/6/08	Fri 11/14/08
21	**PHASE 2 - SEDIMENT REMOVAL (SEASON 2)**	**190 days**	**Mon 3/2/09**	**Fri 11/20/09**
22	MOBILIZATION	30 days	Mon 3/2/09	Fri 4/10/09
23	INSTALL CAL-AM'S PERMANENT WATER DIVERSION PIPELINE	100 days	Fri 5/15/09	Thu 10/1/09
24	RE-INSTALL DEWATERING SYSTEM/COFFERDAMS	15 days	Mon 5/11/09	Fri 5/29/09
25	DEWATERING & CARE OF WATER	95 days	Mon 6/1/09	Fri 10/9/09
26	SEDIMENT EXCAVATION AND DISPOSAL	90 days	Mon 6/1/09	Fri 10/2/09
27	FISH LADDER DEMOLITION & CONSTRUCTION	95 days	Mon 6/1/09	Fri 10/9/09
28	DEMOBILIZATION	30 days	Mon 10/12/09	Fri 11/20/09
29	**PHASE 2 - SEDIMENT REMOVAL (SEASON 3)**	**196 days**	**Mon 3/1/10**	**Mon 11/29/10**
30	MOBILIZATION	30 days	Mon 3/1/10	Fri 4/9/10
31	RE-INSTALL DEWATERING SYSTEM/COFFERDAMS	15 days	Tue 5/11/10	Mon 5/31/10
32	DEWATERING & CARE OF WATER	100 days	Tue 6/1/10	Mon 10/18/10
33	RIVER RESTORATION	100 days	Mon 5/17/10	Fri 10/1/10
34	SEDIMENT EXCAVATION AND DISPOSAL	60 days	Tue 6/1/10	Mon 8/23/10
35	DAM NOTCHING & CONCRETE REMOVAL OPERATIONS	60 days	Tue 6/1/10	Mon 8/23/10
36	SPILLWAY WEIR CONSTRUCTION	40 days	Wed 8/4/10	Tue 9/28/10
37	SLUICEWAY / GATE INSTALLATION	20 days	Tue 8/24/10	Mon 9/20/10
38	CONVEYOR SYSTEM REMOVAL	20 days	Tue 8/24/10	Mon 9/20/10
39	RESTORE RESERVOIR ACCESS ROAD	30 days	Tue 9/21/10	Mon 11/1/10
40	DEMOBILIZATION	30 days	Tue 10/19/10	Mon 11/29/10



Project: SAN CLEMENTE DAM NOTCHING
Date: Mon 12/10/07

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
External Milestone
Deadline

Construction would occur in two distinct phases. Phase 1, in CY 3, would include mobilization, construction of the new access road to the CVFP, OCRD bridge improvements, road aggregate delivery, improvements to existing access roads (high road, low road, plunge pool access road, and pipeline access road), improvement of the access road from Cachagua Grade to the sediment disposal site, and construction of a new access road from the sediment disposal site to the reservoir. The sediment disposal site would be cleared of vegetation and prepared for delivery of the conveyors and radial stackers. After the new road is completed, the supports for the conveyor would be installed and eventually the conveyor sections would be fastened to the supports. First year work may also possibly include construction of some of the stream diversion features and would conclude with demobilization for the winter. In addition, a new water diversion facility would be constructed to replace CAW's existing water diversion at the Dam.

Phase 2 (CY 4, 5 and 6) would include the construction of temporary roads across the reservoir sediment surface to allow access of excavating equipment, the removal of sediment, the notching of the Dam, construction of the new fish ladder, construction of the new river intake and conveyance pipeline extension, the reconstruction of stream channels, and the restoration and revegetation of the sediment pile and reservoir area. It would include seasonal mobilization, stream diversion and reservoir dewatering, and interim stabilization of the sediment pile the first winter.

The majority of the work in Phase 1 is planned to take approximately 10 months between March and December of year three. Phase 2 is planned to take three years. During CY 4, 5 and 6, mobilization would occur during the month of March. Fieldwork in the reservoir area would start early May . Installation of diversion and dewatering facilities would take about one month, with closure of the cofferdams on or about May 31. Fish rescue would continue until June 30. Drawdown of the reservoir would continue until about October. Actual sediment removal operations would take place during a five-month period from June through October. Removal of cofferdams and demobilization of in-stream construction operations would occur October to the end of November. Allowing for holidays and a few days of bad weather, it was assumed that each season would have approximately 100 working days of actual sediment-removal production operations.

Sediment excavation, transport and placement operations would be conducted in two 10-hour shifts, five days per week. The equipment for sediment excavation and transport can sustain an average rate of 500 cubic yards per hour with a peak capacity of 700 cubic yards per hour. The estimated sediment removal rate is about 900,000 cubic yards per season. Two seasons would be required for sediment removal for the Dam notching alternative.

During the last year of sediment removal operations, sediment removal would be completed in August. The Dam notching activities would begin around June of year 6, concurrently with the sediment removal operations, Notching and sediment removal

would be completed August of CY 6. Fish ladder construction would take place during a five-month period from June to October of CY 5. Spillway overflow weir construction would occur August to September of CY 6. Approximately 1,500 cubic yards of concrete would be procured from an off-site commercial concrete plant and would be transported to the site by ready-mix trucks. Concrete placement operations may require an average of four or five concrete truckloads per day. Placement of concrete would be completed in mid November prior to commencement of the rainy season. Removal of cofferdams and demobilization of in-stream construction operations would occur later in November.

Reservoir restoration and channel reconstruction activities would take place concurrently with sediment removal activities. This work would begin at the upstream end of the reservoir and progress downstream as new areas of the historical stream terraces and channel are uncovered. Additional time would be needed at the conclusion of the sediment removal, dam notching, and cofferdam removal operations to complete the reconstruction of the newly exposed portions of the river channel and the revegetation of the old reservoir and sediment inundation areas.

Construction Crews

The requirements for labor, which affects the number of vehicle trips to and from the site, vary from an approximate average of 20 workers per day during Phase I (road construction and improvements scheduled for one season for approximately eight months), to an approximate average of 45 workers per day during Phase II (sediment excavation and disposal, dam modification, and fish ladder construction). A maximum of about 60 workers would be needed during the third year, when sediment excavation and removal would be completed at the same time that dam notching and form erection and concrete placement occur for the fish ladder. Construction crews could be transported to work in car pools to minimize construction-related traffic.

3.4 ALTERNATIVE 2: DAM REMOVAL

3.4.1 OVERVIEW

This alternative would remove SCD to prevent failure from an MCE and a PMF, as described in Section 3.2. Approximately 2.5 million cubic yards (1,555 AF) of accumulated sediment would be removed from behind the Dam over three seasons by excavation with heavy earthmoving equipment. A conveyor belt system would be used to transport the sediment to a disposal area east of the reservoir. the Dam would be demolished and removed from the site. The fish ladder will be demolished and removed.

During the active construction seasons, the Carmel River and San Clemente Creek would be diverted around the reservoir and dam site, and the reservoir would be dewatered. CAW's new diversion intake would be installed upstream to replace the existing intake at the Dam to avoid interruption of this source of CAW's water supply. During construction, the intake would divert through a separate temporary bypass line around the construction site into CAW's existing system. The permanent transmission line to connect the new diversion intake to the existing transmission line to CVFP would be installed at an appropriate point in the construction process. A notch would be cut into OCRD, which is about 1800 feet downstream of SCD, in order to provide adequate fish passage. The river channel exposed through removal of sediment in the historic reservoir inundation zone would be reconstructed.

This project is expected to take seven years to complete, including environmental review, permitting, design, infrastructure improvements, sediment removal, dam demolition, and channel reconstruction. Actual site work, from mobilization to demobilization, would require about five years. The effects of annual precipitation on river flow conditions could affect the schedule in the spring. Construction activities necessary to complete the project are summarized below. Improvements to and/or new roads as part of the proposed project are also conceptually described.

3.4.2 PROJECT LOCATION & ACCESS

The project study area, area of potential effect, facilities, and land ownership are described in Section 3.2. Figures 3.2-1 and 3.2-2 depict the project region and vicinity, respectively.

3.4.3 EXISTING STRUCTURE & OPERATIONS

SCD and reservoir, associated facilities, dam and reservoir operations, the CVFP, the existing fish ladder, and current provisions for fish passage are described in Section 3.2.

3.4.4 PROJECT CHARACTERISTICS

This section describes the SCD removal alternative, including demolition and removal; sediment excavation, transport and disposal; access roads; and stream diversion and reservoir drawdown and dewatering. It also summarizes construction activities necessary to complete the project.

Dam Removal

Dam removal would not proceed until sediment removal is complete (see discussion below). At the conclusion of the sediment removal process, SCD would be demolished using explosives. This involves the demolition and removal of about 7,000 to 8,000 cubic yards of concrete from the site. The concrete debris would be further broken up into pieces of sizes that could be loaded and transported by off-highway trucks to the sediment disposal pile for use in erosion control.

The plunge pool downstream of the Dam would be completely drained prior to dam demolition to allow access for construction workers and machinery for demolition operations. To keep the plunge pool staging area dry during demolition, two cofferdams would be installed as described in Section 3.2.

A truck-mounted crane may be used to drill the holes into the Dam and load the explosives. The crane could be located downstream of the Dam in the drained plunge pool to provide adequate access to the entire footprint of the Dam, from the crest down to the foundation. The crane would also be used to lift out the concrete debris. Large excavators equipped with hydraulic hammers or shears would be used to reduce the size of the concrete debris as needed. Light blasting would also be used to break up the largest concrete pieces into smaller, more manageable pieces.

The existing fish ladder on the left (west) abutment of the Dam will be demolished and removed. The instrument hut near the left abutment also would be removed. the Dam-tender dwelling would be preserved and possibly converted to other uses.

Modification of CAW Water Diversion Point

Section 3.3 describes current CAW infrastructure and operations requirements for a point of diversion that will provide the required hydraulic head to drive the water through the existing filters to the clearwell for distribution. A subsurface screened intake at the head of San Clemente Reservoir was tentatively selected as the new water diversion point for the Dam removal alternative. This option is described in Section 3.3. The approximate location of the new screened intake and anticipated alignment of the pipeline extension are shown on Figure 3.3-3.

Electrical System

The existing electrical service and proposed modifications required to meet power requirements for this alternative (primarily for the conveyor system) are described in Section 3.3.

Sediment Excavation, Transport & Disposal

San Clemente Reservoir has been estimated to contain approximately 2.5 million cubic yards of sediment (MEI 2003). The characteristics of this sediment are described above, in Section 3.3. To mitigate risks for sediment accumulation and flooding in downstream reaches of the river, removal of the Dam requires the prior removal of the sediment accumulated in the reservoir since the Dam was placed in service in 1921 (note that during dam construction the streambed was excavated to about 20 feet below its original level at the Dam). As a result of the sediment removal efforts, the Carmel River and San Clemente Creek stream channels would be exposed and require reconstruction.

Several excavation methods (mechanical excavation and hydraulic dredging) are considered feasible (see Appendix G for more detail). Mechanical excavation and transport by conveyor appear to have a slight cost advantage, are simpler, and would have lesser environmental impacts than other methods. The selected approach is described in more detail below.

Sediment Excavation

The mechanical excavation of sediment would be conducted using the methods described in Section 3.3. During the first sediment removal season, the sediment would be excavated from a starting elevation ranging between 525 to 545 feet to an elevation of 505 to 525 feet. During the second season, excavation would reach a target elevation of approximately 480 to 500 feet. During the third construction season, the remaining sediment would be removed to approximately the depth of the original streambed that existed in 1921.

Pre-drainage of sediments prior to excavation would likely become ineffective in the silt deposits that exist below about elevation 485 feet within 600 to 900 feet of the Dam (see Figures 3.5a and 3.5.b in MEI 2003). These materials would not be reached until the last sediment excavation season. They would be mucked out using large excavators, draglines, or clamshells working from firm ground. The excavated materials would be placed in a drying/staging area in the immediate vicinity of the point of excavation, from where they would be excavated again and transported to the central stockpile area and conveyor loading facility.

Sediment Transport

The excavated sediment would be transported to a central stockpile in the reservoir near the mouth of the ravine where Site 4R is located. Section 3.3 describes the conveyor belt system proposed for use.

Sediment Disposal

A plan of Site 4R and a capacity curve for the site are shown in Figure 3.3-4. The maximum capacity of the site is undetermined but is well in excess of the estimated required volume of 2.5 million cubic yards. The footprint area of the sediment pile would be approximately 23 acres. The watershed area tributary to the sediment pile site is approximately 252 acres.

Site preparation prior to sediment disposal, disposal site operations and maintenance, and site restoration would all be the same as described in Section 3.3.

Stream Diversion and Reservoir Drawdown and Dewatering

Both the Carmel River and the San Clemente Creek would be diverted around the active areas of sediment excavation during the construction season. The approach to diversion, reservoir drawdown and dewatering is the same as described in Section 3.3.

3.4.5 PROJECT ACCESS AND IMPROVEMENTS

Road access to the sediment disposal site and San Clemente Reservoir would be established via Cachagua Grade. An existing jeep trail that extends between a gated entrance off Cachagua Grade and the sediment disposal site would be improved, and a conveyor belt system and maintenance road would be installed between the reservoir and the sediment disposal site. Road realignment and improvements are discussed in more detail below.

Access from Carmel Valley Road to San Clemente Dam

Existing vehicle access to SCD and the filter plant from Carmel Valley Road is described in Section 3.2. Improvements to these existing access roads are also described in Section 3.2.

Minor improvements may be made to the “High Road” (crossing a ford over the Carmel River) or “Low Road” (using an existing bridge across the river at the OCRD). These roads may require localized grading and/or widening, cut or fill slope stabilization, and vegetation removal. However, no major improvements are contemplated since the primary access to the reservoir will be via Cachagua Grade as described below.

At the OCRD, an existing unimproved single lane road follows the southeast side of the Carmel River to the plunge pool at the base of the Dam. This road has been in limited use and had a number of washouts from the 1995 and 1998 floods. This plunge pool access road would be improved to place the downstream cofferdams and stage the crane and other construction equipment used in demolition operations at the base of the Dam. Some tree pruning and removal would be needed. The roadbed would be filled with sand and gravel and topped with crushed rock to provide one lane, two-way access and designated pullouts. An asphaltic sealant coat would be applied to the crushed rock to stabilize it and prevent it from moving into the river.

Access to Sediment Disposal Site and Reservoir

The primary access used to develop the sediment disposal site and access the reservoir would be via Carmel Valley Road and Cachagua Grade. This access and proposed improvements to it are described in Section 3.3.

3.4.6 PARTIAL RECONSTRUCTION OF THE RIVER CHANNEL AND REVEGETATION OF THE VALLEY FLOOR

Removal of the reservoir sediment would expose the pre-1921 alluvial deposits in the river channel and floodplain through the historic reservoir inundation zone. A three-stage channel would be provided through selective contouring along both the Carmel River and San Clemente Creek. The channel would be similar to but longer than the one described in Section 3.3.

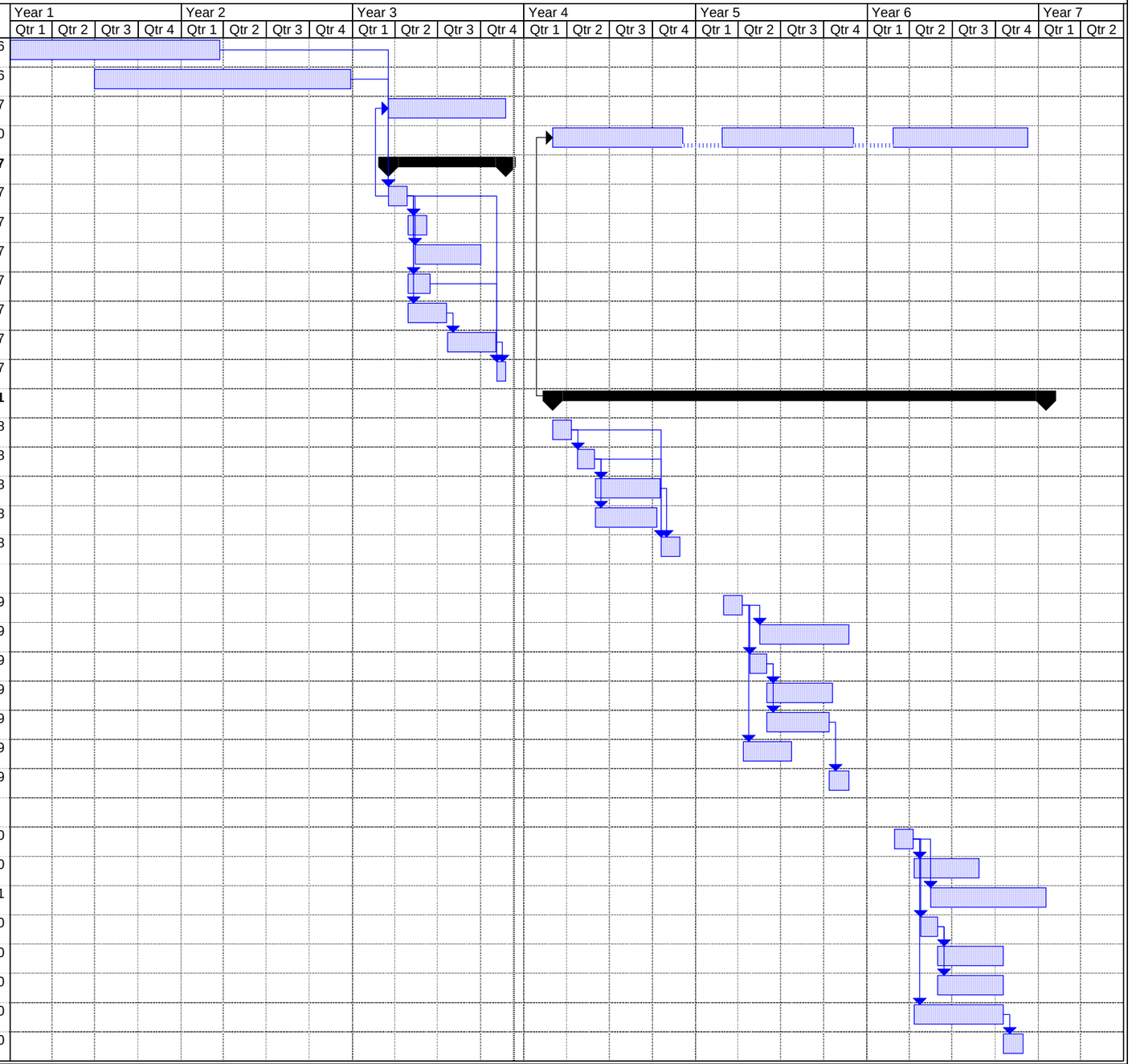
3.4.7 CONSTRUCTION SCHEDULE AND OPERATIONS

A conceptual schedule is presented in Figure 3.4-1 Project Schedule. Following the State Notice of Determination and Federal Record of Decision, final engineering studies would begin in CY 2. These include geotechnical investigations for the sediment site and access roads; design of the access roads and conveyor system; design of the sediment pile including stability and hydrologic analyses; design of the new water intake and conveyance pipeline extension; planning for demolition of the Dam; planning and design of stream bypass and dewatering facilities; design of the reconstruction of the Carmel River and San Clemente Creek channels; and design of mitigation or habitat enhancement plans for CRLF and steelhead. A construction contract package is planned to be developed and construction bids solicited late in CY 1, for award early in CY 2.

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Figure 3.4-1 SAN CLEMENTE DAM SEISMIC SAFETY EIR/EIS PROJECT
ALTERNATIVE 2- DAM REMOVAL
CONCEPTUAL SCHEDULE

ID	Task Name	Duration	Start	Finish
1	PERMITTING	320 days	Mon 1/3/05	Fri 3/24/06
2	ENGINEERING DESIGN	390 days	Fri 7/1/05	Thu 12/28/06
3	SH &CRLF MIT MONTORING PHASE 1	180 days	Mon 3/19/07	Fri 11/23/07
4	SH &CRLF MIT MONTORING PHASE 2	604 days	Mon 3/3/08	Thu 12/9/10
5	**PHASE 1**	**180 days**	**Mon 3/19/07**	**Fri 11/23/07**
6	MOBILIZATION	30 days	Mon 3/19/07	Fri 4/27/07
7	SET-UP STREAM DIVERSION	30 days	Mon 4/30/07	Fri 6/8/07
8	INSTALL CAL-AM'S WATER DIVERSION INTAKE AND PIPELINE	100 days	Tue 5/15/07	Mon 10/1/07
9	ACCESS ROAD UPGRADE	35 days	Mon 4/30/07	Fri 6/15/07
10	RESERVOIR/CONVEYOR ACCESS ROAD	60 days	Mon 4/30/07	Fri 7/20/07
11	CONVEYOR FOUNDATIONS AND SECTIONS	75 days	Mon 7/23/07	Fri 11/2/07
12	DEMOBILIZATION	15 days	Mon 11/5/07	Fri 11/23/07
13	**PHASE 2**	**751 days**	**Mon 3/3/08**	**Mon 1/17/11**
14	MOBILIZATION	30 days	Mon 3/3/08	Fri 4/11/08
15	INSTALL DEWATERING SYSTEM	26 days	Fri 4/25/08	Fri 5/30/08
16	DEWATERING & CARE OF WATER	100 days	Mon 6/2/08	Fri 10/17/08
17	SEDIMENT EXCAVATION AND DISPOSAL	95 days	Mon 6/2/08	Fri 10/10/08
18	DEMOBILIZATION	30 days	Mon 10/20/08	Fri 11/28/08
19				
20	MOBILIZATION	30 days	Mon 3/2/09	Fri 4/10/09
21	RIVER RESTORATION	136 days	Mon 5/18/09	Mon 11/23/09
22	INSTALL DEWATERING SYSTEM	26 days	Mon 4/27/09	Mon 6/1/09
23	DEWATERING & CARE OF WATER	100 days	Tue 6/2/09	Mon 10/19/09
24	SEDIMENT EXCAVATION AND DISPOSAL	95 days	Tue 6/2/09	Mon 10/12/09
25	DRILL DAM ABOVE EL. 525	75 days	Mon 4/13/09	Fri 7/24/09
26	DEMOBILIZATION	30 days	Tue 10/13/09	Mon 11/23/09
27				
28	MOBILIZATION	30 days	Mon 3/1/10	Fri 4/9/10
29	INSTALL CAL-AM'S PERMANENT WATER DIVERSION PIPELINE	100 days	Mon 4/12/10	Fri 8/27/10
30	RIVER RESTORATION	176 days	Mon 5/17/10	Mon 1/17/11
31	INSTALL DEWATERING SYSTEM	26 days	Mon 4/26/10	Mon 5/31/10
32	DEWATERING & CARE OF WATER	100 days	Tue 6/1/10	Mon 10/18/10
33	SEDIMENT EXCAVATION AND DISPOSAL	100 days	Tue 6/1/10	Mon 10/18/10
34	DAM DRILLING & DEMOLITION	136 days	Mon 4/12/10	Mon 10/18/10
35	DEMOBILIZATION	30 days	Tue 10/19/10	Mon 11/29/10



Project: SAN CLEMENTE DAM REMOVAL
Date: Mon 12/10/07

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
External Milestone
Deadline

Construction would occur in two distinct phases. Phase 1, in CY 3, would include mobilization, improvement of the access road from Cachagua Grade to the sediment disposal site, and construction of a new access road from the sediment disposal site to the reservoir. The sediment disposal site would be cleared of vegetation and prepared for delivery of the conveyors and radial stackers. After the new road is completed, the supports for the conveyor would be installed and eventually the conveyor sections would be fastened to the supports. Phase 1 work may also possibly include construction of some of the stream diversion features and would conclude with demobilization for the winter. In addition, a new water diversion facility would be constructed to replace CAW's existing diversion facility at the Dam. Phase 2, in CY 4, 5 6, and January of CY 7 would include the construction of temporary roads across the reservoir sediment surface to allow access of excavating equipment, removal of sediment, demolition of the Dam; reconstruction of stream channels, and restoration and revegetation of the sediment pile and reservoir area. It would include seasonal mobilization, stream diversion and reservoir dewatering, and interim stabilization of the sediment pile the first winter. The permanent transmission line to connect the new diversion intake to the existing transmission line to CVFP would be installed at an appropriate point in the construction process.

The majority of the work in Phase 1 is planned to take approximately nine months between March and November of CY 3. Phase 2 is planned to take three years and one month. During each of these years, mobilization would occur during the month of March. Fieldwork in the reservoir area would start approximately around May. Installation of diversion and dewatering facilities would take about one month, with closure of the cofferdams on or about May 31. Fish rescue would continue until June 30. Drawdown of the reservoir would continue until about October Actual sediment removal operations would take place during a five-month period from June through October. Removal of cofferdams and demobilization of in-stream construction operations would occur in November. Allowing for holidays and a few days of bad weather, it was assumed that each season would have approximately 100 working days of actual sediment-removal production operations.

Sediment excavation, transport and placement operations would be conducted in two 10-hour shifts, five days per week. The equipment for sediment excavation and transport can sustain an average rate of 500 cubic yards per hour with a peak capacity of 700 cubic yards per hour. The estimated sediment removal rate is about 900,000 cubic yards per season. Three seasons would be required for sediment removal for the Dam removal alternative.

During the last year of sediment removal operations, sediment removal would be completed in October. The upper portion of the Dam would be demolished while sediment removal is being completed, and dam demolition and removal activities would continue into the fall and be completed in October. Removal of cofferdams and demobilization of in-stream construction operations would occur from October to the end of November.

Reservoir restoration and channel reconstruction activities would take place concurrently with sediment removal activities. This work would begin at the upstream end of the reservoir and progress downstream as new areas of the historical stream terraces and channel are uncovered. Additional time would be needed at the conclusion of the sediment removal, dam demolition, and cofferdam removal operations to complete the reconstruction of the newly exposed portions of the river channel and the revegetation of the old reservoir and sediment inundation areas.

Construction Crews

The requirements for labor, which affects the number of vehicle trips to and from the site, vary from an approximate average of 15 workers per day during Phase I (road construction and improvements scheduled for one season for approximately eight months), to an approximate average of 40 workers per day during Phase II (sediment excavation and disposal). A maximum of about 60 workers would be needed during July through October. Construction crews could be transported to work in car pools to minimize construction-related traffic.

3.5 ALTERNATIVE 3: CARMEL RIVER REROUTE & DAM REMOVAL

3.5.1 OVERVIEW

This alternative would remove SCD to prevent failure from a MCE and a PMF, as described in Section 3.2. Approximately 380,000 cubic yards (235 AF) of accumulated sediment behind the Dam on the San Clemente Creek arm of the reservoir would be relocated to the Carmel River arm, where the bulk of accumulated sediment already has been deposited. A portion of the Carmel River would be permanently bypassed by cutting a 450-foot-long channel between the Carmel River and San Clemente Creek, approximately 2500 feet upstream of the Dam. The bypassed portion of the Carmel River would be used as a sediment disposal site for the accumulated sediment. The spoils from channel construction (235,000 cubic yards or 145 AF) would be used for construction of a diversion dike at the upstream end of the bypassed reservoir arm. The Dam and fish ladder would be demolished and removed from the site.

During the active construction seasons, the Carmel River and San Clemente Creek would be diverted around the reservoir and dam site, and the reservoir would be dewatered. CAW's new diversion intake would be installed upstream to replace the existing intake at the Dam to avoid interruption of this source of CAW's water supply during construction. The intake would divert through a separate temporary bypass line around the construction site into CAW's existing system. Accumulated sediment would be removed from behind the Dam over one season by excavation with heavy earthmoving equipment. The equipment would transport the sediment to a disposal area in the bypassed portion of the reservoir. The sediments at the downstream end of the bypassed reservoir arm would be stabilized and protected from erosion. The San Clemente Creek channel would be reconstructed through its historic inundation zone from the exit of the diversion channel to the dam site. The permanent transmission line to connect the new diversion intake to the existing transmission line to CVFP would be installed at an appropriate point in the construction process.

A notch would be cut into OCRD, which is about 1800 feet downstream of SCD, in order to provide adequate fish passage.

This project is expected to take five years to complete, including environmental review, permitting, design, infrastructure improvements, sediment removal, bypass channel excavation, diversion dike construction, dam demolition, and creek channel reconstruction. The effects of annual precipitation on river flow conditions could affect the schedule in the spring. Construction activities necessary to complete the project are summarized below. Improvements to and/or new roads proposed as part of the project are also conceptually described.

3.5.2 PROJECT LOCATION & ACCESS

The project study area, area of potential effect, facilities, and land ownership are described in Section 3.2. Figures 3.2-1 and 3.2-2 depict the project region and vicinity,

respectively. An overview of the site is shown on Figure 3.5-1, and a detailed site plan is shown on Figure 3.5-2.

3.5.3 EXISTING STRUCTURE & OPERATIONS

SCD and reservoir, associated facilities, dam and reservoir operations, the CVFP, the existing fish ladder, and current provisions for fish passage are described in Section 3.2.

3.5.4 PROJECT CHARACTERISTICS

This section describes the Carmel River reroute and dam removal project, including demolition and removal; sediment excavation and relocation; access roads; stream channel restoration; and stream diversion and reservoir drawdown and dewatering. It also summarizes construction activities necessary to complete the project.

Dam Removal

Dam removal would not proceed until sediment in the San Clemente Creek arm is relocated to the Carmel River arm. At the conclusion of the sediment removal process, SCD and existing fish ladder would be demolished in the same manner as described for alternative 2 (Section 3.4).

Modification of CAW Water Diversion Point

Section 3.3 describes current CAW infrastructure and operations requirements for a point of diversion that will provide the required hydraulic head to drive the water through the existing filters to the clearwell for distribution. A subsurface screened intake at the head of San Clemente Reservoir was tentatively selected as the new water diversion point for the Dam removal alternative. This option is described in Section 3.3. The approximate location of the new screened intake and anticipated alignment of the pipeline extension are shown on Figure 3.3-3. The permanent diversion intake and temporary water diversion pipeline would be installed to replace the existing intake at the Dam to avoid interruption of this source of CAW's water supply while the project is under construction. The permanent pipeline will be installed at an appropriate point in the construction process.

ACCESS ROAD FROM CACHAGUA GRADE TO SITE
(EXISTING JEEP TRAIL TO BE IMPROVED)

NEW ACCESS ROAD TO RESERVOIR

SEDIMENT DISPOSAL AREA

EXISITNG 30-INCH DIAMETER
DIVERSION PIPELINE

STABILIZED
SEDIMENT SLOPE

30-INCH DIAMETER DIVERSION PIPELINE
EXTENSION ALONG RIGHT BANK OF RIVER
CHANNEL TO NEW DIVERSION POINT

DIVERSION DIKE

DIVERSION CHANNEL

RIVER WATER INTAKE
SYSTEM (RANNEY INTAKE)

0 1000 2000
FEET

REV	DATE	BY	DESCRIPTION

SCALE

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED
DRAWN
CHECKED

MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER
SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
CARMEL RIVER BYPASS SITE PLAN

Figure 3.5-1

DIVERSION PIPE ON EXISTING SEDIMENT

STABILIZED SEDIMENT SLOPE

GEOGRID

SEDIMENT DISPOSAL AREA LIMITS

TEMPORARY DIVERSION PIPE (EMBEDDED IN SEDIMENT AND FOUNDATION BELOW DIVERSION DIKE)

EXISTING 30-INCH DIAMETER DIVERSION PIPELINE

DAM TO BE REMOVED

DIVERSION DIKE

RIVER WATER INTAKE SYSTEM (RANNEY INTAKE)

PERMANENT 30-INCH DIAMETER DIVERSION PIPELINE EXTENSION TO NEW DIVERSION POINT

15' WIDE TEMPORARY HAUL ROAD

TEMPORARY SHEETPILE COFFERDAM

SEDIMENT TO BE REMOVED FROM SAN CLEMENTE CREEK ARM

DIVERSION CHANNEL

DIVERSION SILL

0 300 600

FEET

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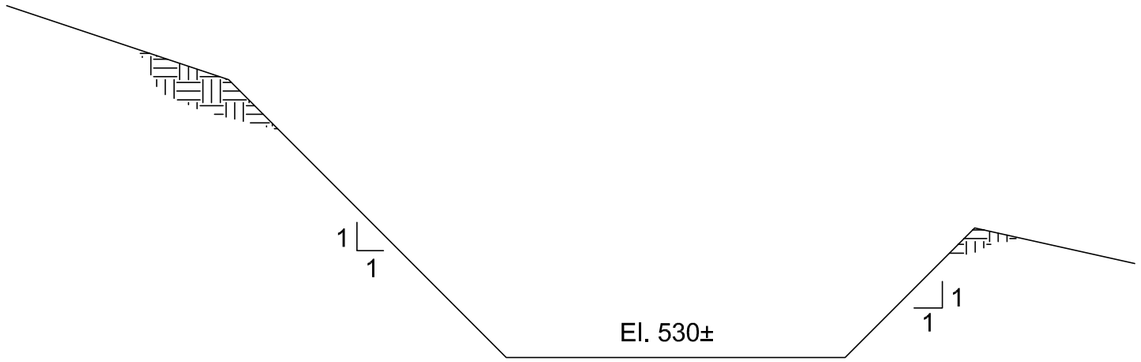
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California

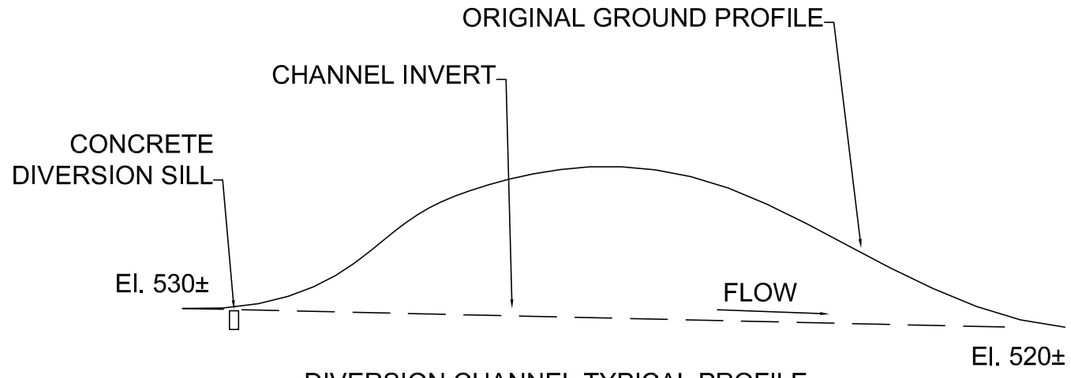
CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
DETAILED CARMEL RIVER BYPASS SITE PLAN

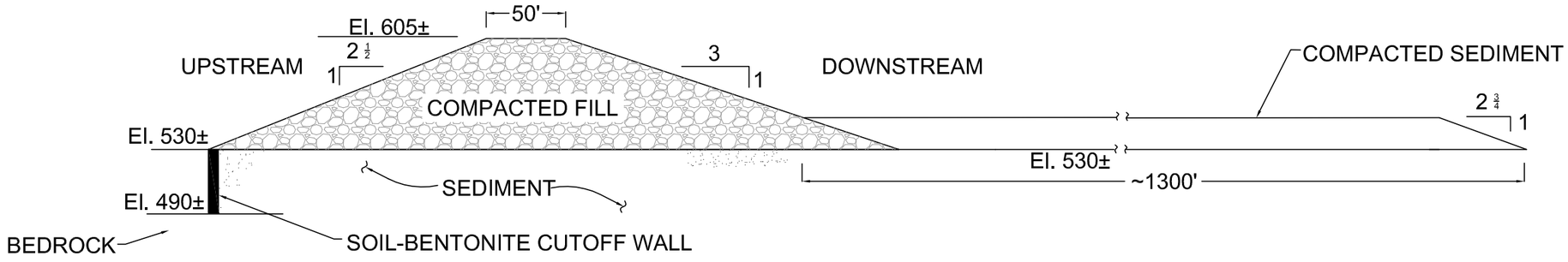
Figure 3.5-2



DIVERSION CHANNEL TYPICAL CROSS-SECTION
(LOW-FLOW THALWEG & INSTREAM FEATURES NOT SHOWN)



DIVERSION CHANNEL TYPICAL PROFILE



DIVERSION DIKE AND SEDIMENT PILE TYPICAL CROSS-SECTION

0 40 80
SCALE IN FEET

REV	DATE	BY	DESCRIPTION

SCALE

DESIGNED
DRAWN
CHECKED

MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER
SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
CHANNEL, DIKE, & DISPOSAL SITE CROSS SECTIONS

Figure 3.5-3

XREF: BDR
FILE: F:\Shared\Working Projects\Cal Am Water\Alternative 4 – Dam Removal with Carmel River Bypass\Figures\RIVER BYPASS FIGURE 3.dwg USER: visaohola Jun 22, 2005 10:49am Job No: 1004231

Electrical System

The existing electrical service is described in Section 3.3. Construction power requirements would be limited for the bypass construction and dam removal because the sediment and dam removal operations would be primarily performed with diesel-powered equipment. However, it is anticipated that sediment removal would include smaller loads due to factors such as dewatering requirements, construction office trailers, equipment maintenance shop, and night lighting. Based on preliminary discussions with PG&E, the configuration of the existing PG&E 60-kV and 12-kV power lines would be able to handle the construction load and supply the needed power through temporary 12-kV extensions from the left abutment. Several substations (transformers, breakers, motor starters, controls, etc.) would be installed along the extended line to power lighting, dewatering pumps, etc. The feasibility of this alternative approach would need to be confirmed during design by PG&E by conducting the appropriate utility load studies, protection studies, short circuit studies, and coordination studies. Associated changes that the utility might require as a result of these studies would need to be implemented.

Sediment Excavation & Relocation

San Clemente Reservoir has been estimated to contain approximately 2.5 million cubic yards (1,550 AF) of sediment (MEI 2003). The characteristics of the sediment are described above, in Section 3.3.

Sediment Disposal Site

The Carmel River Reroute and Dam Removal alternative would use the bypassed arm of the Carmel River (where the bulk of accumulated sediment has already been deposited) as a disposal site, minimizing sediment excavation quantities and transport distances. This alternative would confine all work, excluding access improvements, within the existing reservoir site boundaries. Because of the site's remoteness, sediment removal could proceed in two daily shifts without disturbing neighboring communities or sensitive receptors, thus resulting in a shorter schedule than for some of the other sites considered.

The maximum capacity of the disposal site is undetermined but is well in excess of the required excavated volume of 380,000 cubic yards estimated by MEI (MEI 2005). Thus, the bypass site has ample capacity to store all sediment. The toe of the sediment pile would be located at approximate elevation 530 feet. The top of the sediment pile would be at about elevation 550 feet in order to contain all of the sediment accumulated in the San Clemente Creek portion of the reservoir. The footprint area of the sediment pile would be approximately 13 acres. The watershed area tributary to the sediment pile site is approximately 21 acres.

Sediment Excavation, Transport, and Placement

Several excavation methods (mechanical excavation and hydraulic dredging) are considered feasible (see Appendix G for more detail). Mechanical excavation appears to have a slight cost advantage, is simpler, and would have lesser environmental impacts than other methods.

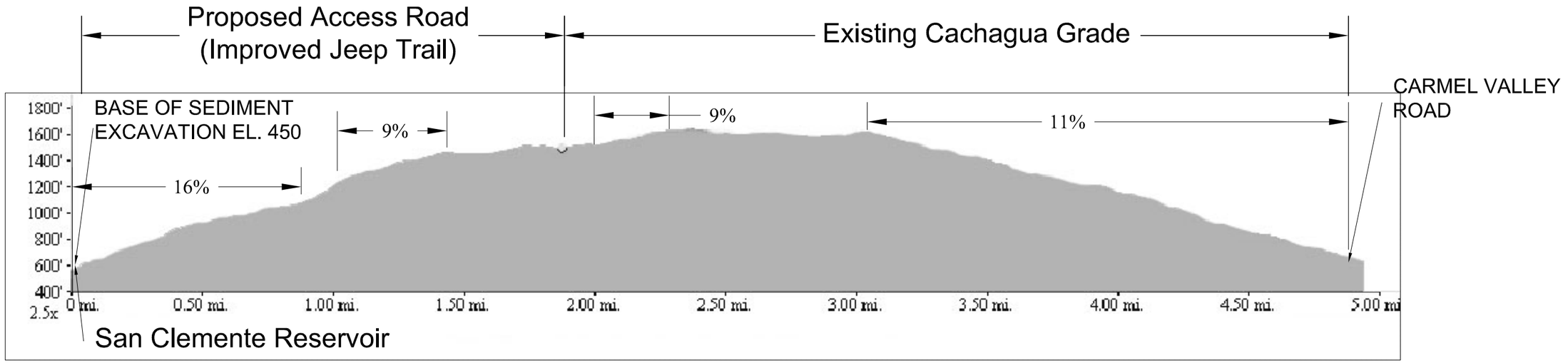
It is anticipated that the sediment would be removed in planes approximately parallel to the existing surface of the sediment in the San Clemente Creek arm of the reservoir. This approach is consistent with the preferred excavation method using scrapers. In combination with reservoir dewatering and sediment pre-draining activities described above, this method would also help maintain the excavation work above the groundwater level for as long as possible. The third year of construction will be dedicated to access improvements and temporary stream diversion features. During the fourth construction season, the sediment would be removed to approximately the depth of the original streambed that existed in 1921 (note that, at the Dam, the streambed was excavated to about 20 feet below its original level). However, it is anticipated that final sediment removal and clean up would occur during the fourth construction season prior to dam removal operations.

Excavation of sediment above the water table would be performed using self-loading scrapers or similar self-propelled excavating equipment. The scrapers would transport the material to the disposal area on the bypassed reservoir arm, where the material would be allowed to drain further, and then compacted in place. The proposed disposal site location and layout is shown on Figure 3.5-2.

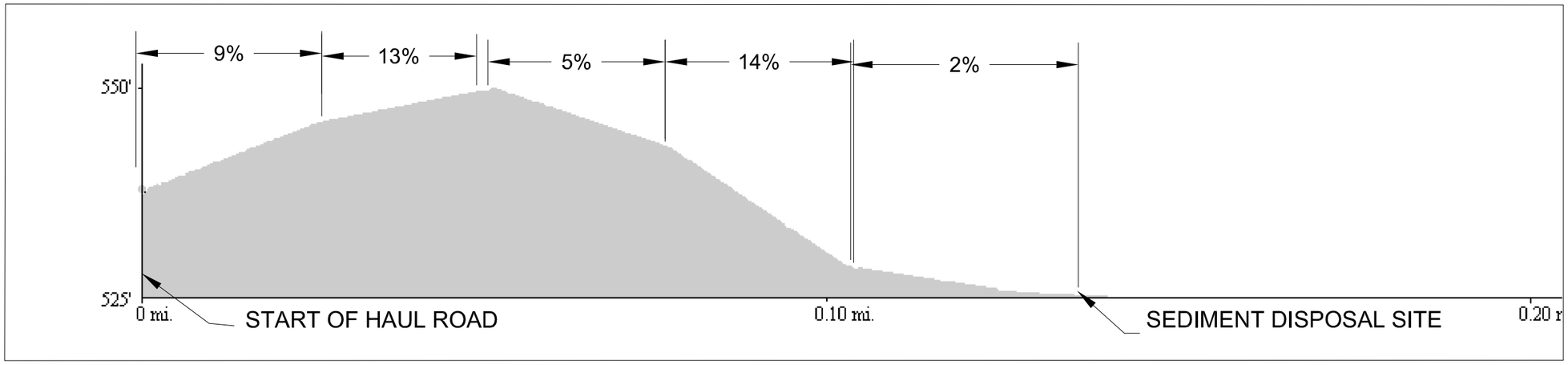
Pre-drainage of sediments prior to excavation would likely become ineffective in the silt deposits that exist below about elevation 485 feet within 600 to 900 feet of the Dam (see Figures 3.5a and 3.5.b in MEI 2003). These materials would be reached towards the end of the initial sediment excavation season. They would need to be mucked out using large hydraulic excavators, draglines, or clamshells working from firm ground. The excavated materials would be placed in a drying/staging area in the immediate vicinity of the point of excavation, from where they would be excavated again and transported to the disposal area on the bypassed reservoir arm.

Scrapers and other earthmoving equipment would transport the excavated sediment from San Clemente Creek to the bypassed Carmel River arm via a connecting road that traverses the land peninsula between the two reservoir arms. The approximate route and profile of the road is shown in Figure 3.5-4. At the disposal site, a bulldozer would be used to spread the sediment across the disposal area in preparation for compaction.

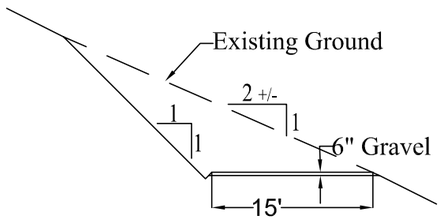
Site preparation prior to sediment disposal would include (1) the clearing and grubbing of trees and vegetation from the sediment pile footprint, (2) the removal of any existing facilities (none have been identified), and (3) the stripping and stockpiling of organic soils (minimal) for use in subsequent restoration and revegetation of the site once sediment placement has been completed.



PROFILE OF ACCESS ROAD TO RESERVOIR SITE



PROFILE OF HAUL ROAD



TYPICAL ACCESS ROAD SECTION

Scale: 1" = 15'

REV	DATE	BY	DESCRIPTION

SCALE

WARNING
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MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
PROFILES OF SITE ACCESS AND HAUL ROADS

Figure 3.5-4

XREF: BDR
FILE: F:\Shared\Working Projects\Cal Am Water\Alternative 4 – Dam Removal with Carmel River Bypass\Figures\RIVER BYPASS FIGURE 4.dwg USER: visoahola Jun 22, 2005 11:05am Job No: 1004231

Upon delivery of sediment to the site, the sediment would be spread by means of bulldozers into thin, nearly horizontal lifts. Each lift would be compacted using the same bulldozers or vibratory compactors. The sediment pile would be constructed with a side slope as required for stability. The side slope has been assumed to average 2-3/4 horizontal to 1 vertical for the purpose of performing site capacity calculations. Concrete debris from dam removal would be placed on selected areas of the pile to provide long-term erosion protection. Such areas include the groins along the contact between the pile and the hillside abutments. A large percentage of the concrete used to construct the Dam does not have reinforcement. However, where reinforced concrete exists in the concrete debris from demolition, it will be separated out and disposed of at an offsite facility. This is not anticipated to require extensive offsite disposal hauling during construction.

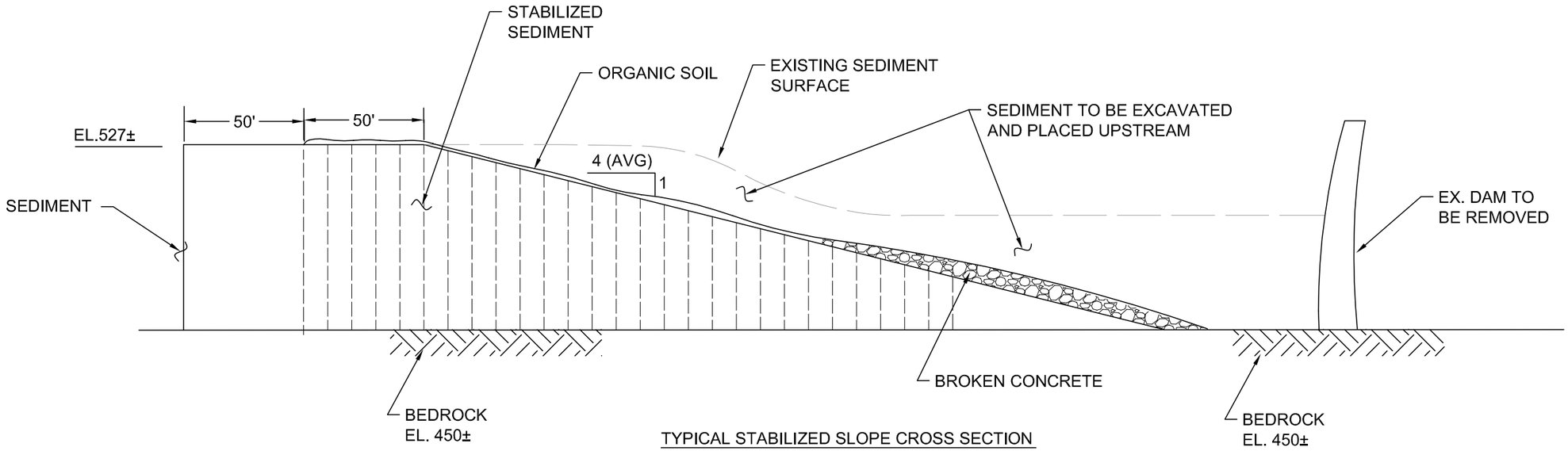
At the conclusion of each construction season, the portions of the excavation and disposal site above the maximum reservoir level (El. 525) would need to be winterized. This would involve (1) providing interim drainage and diversion of ravine flows, (2) stabilizing sloping sediment surfaces and other disturbed areas by installing erosion protection features such as erosion control mats or straw mulch and wattles, and (3) providing sediment collection features such as silt fences, straw bales, and sediment traps along the toe of the pile and other disturbed areas.

Once placement of sediment and concrete debris has been completed, the topsoil from the temporary topsoil stockpile developed during site stripping would be spread over the sediment pile. The graded surface would again be stabilized with erosion control measures as described above and would be revegetated with native plants and trees obtained from the site vicinity. A typical section for the sediment pile is shown on Figure 3.5-5, which abuts against the diversion dike on one end.

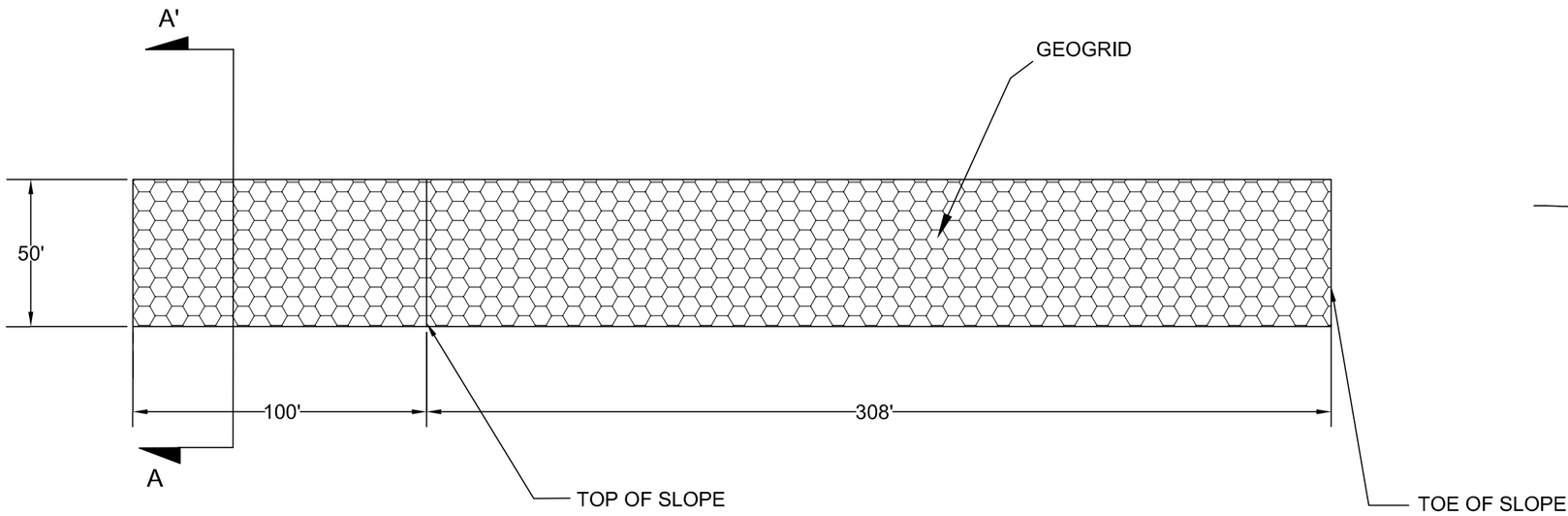
Slope Stabilization of Sediment in the Carmel River Channel

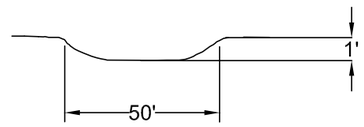
As part of the sediment excavation and disposal activities, the bypassed sediment in the Carmel River arm, roughly 100 feet upstream of the Dam, would be excavated and graded to produce a 4 horizontal to 1 vertical slope with a maximum length from crest to toe of about 330 feet. The slope would span the width of the river channel (~300 feet) with the top of slope elevation at El. 527 and the toe of slope at El. 450 at the deepest point of the river channel (Figure 3.5-5). After initial excavation of the silty “muck” soils at the base of the slope by clamshell, the 4 to 1 slope would be benched at regular intervals to allow for slope stabilization construction using large augers. The large augers would produce soil-cement columns by mixing cement with the existing soil to bedrock in a grid-like pattern along most of the slope face, starting 50 feet from the top of slope. Figure 3.5-6 shows a typical soil-cement mixing pattern and a three-dimensional isometric view of the completed columns (soil excluded for clarity). The soil-cement grid would serve the dual purpose of increasing the soil strength, thus stabilizing the slope, and raising the phreatic surface in the stabilized sediments in order to maintain the existing wetland areas immediately upstream of the slope.

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TYPICAL STABILIZED SLOPE CROSS SECTION





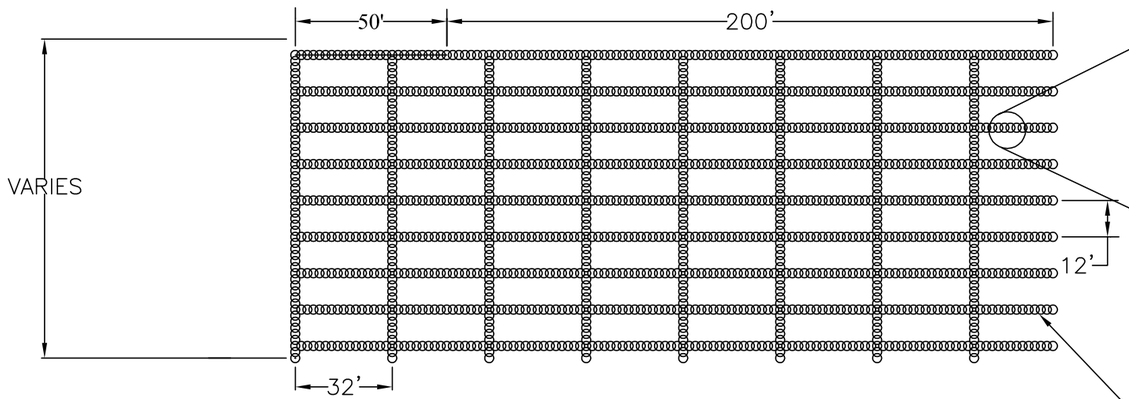
SECTION A - A'
(NTS)

PLAN VIEW - GEOGRID LAYOUT ON STABILIZED SLOPE FACE

0 50 100

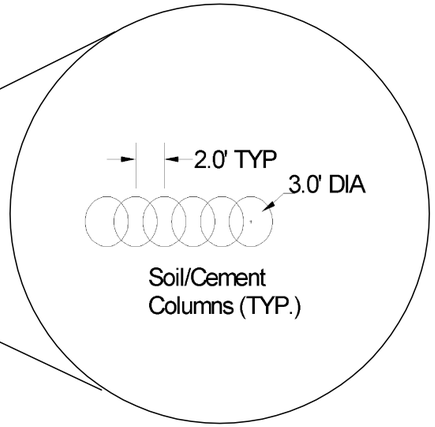
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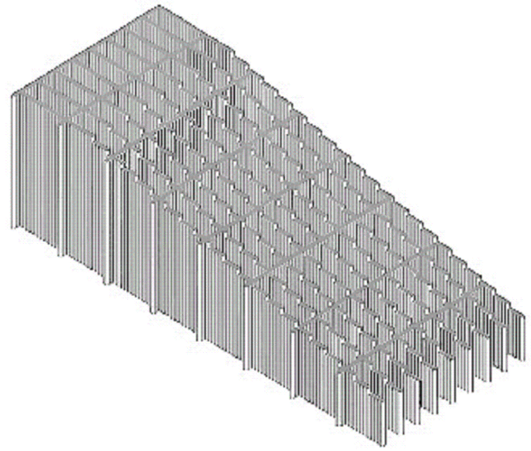
REV	DATE	BY	DESCRIPTION	SCALE		DESIGNED	DRAWN	CHECKED	MWH Walnut Creek California	CALIFORNIA AMERICAN WATER SAN CLEMENTE DAM SEISMIC RETROFIT EIR/EIS PROJECT STABILIZED SEDIMENT SLOPE	Figure 3.5-5



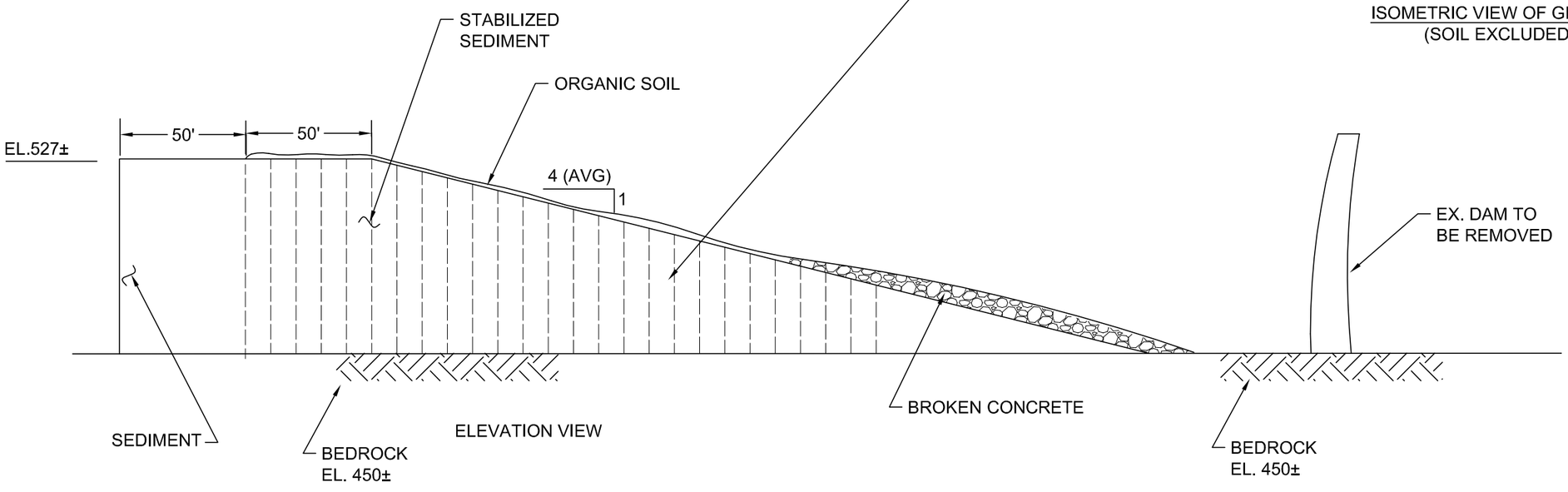
PLAN VIEW

DEEP SOIL/CEMENT MIXING PATTERN





ISOMETRIC VIEW OF GROUND TREATMENT BY SOIL MIXING (NTS)
(SOIL EXCLUDED TO SHOW SOIL-CEMENT COLUMNS)



TYPICAL STABILIZED SLOPE SECTION

0 50 100
FEET

REV	DATE	BY	DESCRIPTION	SCALE		DESIGNED	DRAWN	CHECKED

MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
SOIL–CEMENT MIXING PLAN AND ISOMETRIC VIEW

Figure 3.5-6

After soil-cement mixing equipment demobilization, minor grading would be performed on the slope face and a geogrid would be installed on the center of slope to form a 50-foot-wide shallow channel to convey runoff from the local drainage area above the slope and minimize surface erosion. The geogrid would be placed beginning 100 feet from the top of slope, extending to the toe of slope (Figure 3.5-5). In addition, concrete debris from the demolished dam would be placed at the lower third of the slope to further stabilize the sediment and protect it against erosion from flood flows in the main river channel. Once stabilization has been completed, a 2-foot-thick layer of organic soil would be added, and the slope would be vegetated.

Stream Diversion and Reservoir Drawdown and Dewatering

Both the Carmel River and the San Clemente Creek would be diverted around the active areas of sediment excavation during the construction seasons. The approach to diversion, reservoir drawdown and dewatering are the same as described in Section 3.3.4.

Demolition and construction operations in the reservoir area will impact the diversion piping. Thus, burial or encasement of diversion piping will be necessary near the channel demolition areas, diversion dike foundation, and sediment disposal area. Figure 3.5-2 shows temporary diversion piping protection areas. In addition, during the final construction season when the Dam is demolished, diversion piping would be required to be routed over the Dam (instead of through the Dam intakes) along the right abutment. The diversion piping in the vicinity of the Dam would require protection during dam demolition operations (see Figure 3.5-2).

Exact locations of the diversion cutoff walls and pipelines, drainage trenches and well points would be field determined during detailed design. The Carmel River diversion will be upstream of the diversion channel inlet. The diversion on the San Clemente Creek reservoir branch would be placed upstream of the diversion channel outlet during each construction season. In general, diversion piping would follow along the reservoir banks.

Diversion Channel and Dike Construction

In order to permanently bypass the sediment disposal area on the Carmel River, a diversion channel must be constructed to connect Carmel River to San Clemente Creek. The location of this diversion channel is shown on Figures 3.5-1 and 3.5-2 a typical profile and section are shown on Figure 3.5-3. Blasting operations will be required to remove the large volume of rock between the two reservoir arms. Blasting operations will include:

- Clearing and grubbing of the blast area;
- An explosives magazine established onsite to store explosives;
- Pre-drilling of rock to place explosives; and

- Pre-splitting of rock at the channel boundaries to define the channel geometry.

The total blasted volume of rock is estimated at about 145 AF, or about 234,000 cubic yards (MEI 2005). Most of the blasted rock will be broken into 1-foot pieces or smaller. It is anticipated that minor operations will be required to reduce a small percentage of the blasted rock into 1-foot size and smaller with hoe-rams and similar equipment. A portion of the 1-foot and larger pieces of blasted rock will be separated for use in armoring of the diversion dike face that would be exposed to river flows.

As described in further detail below, bankfull and thalweg channels would be constructed as part of the channel excavation operations. In addition, habitat complexity would be promoted within the channel by constructing pools, runs, and riffles to provide suitable depth and velocity conditions for steelhead migration. The channel profile and section in Figure 3.5-3 show only the general geometry of the channel construction as used in the MEI hydraulic analyses (MEI 2005), which included a diversion sill at the channel upstream El. 530 and a slightly steeper slope than the natural channel (i.e., approximately 3 percent).

During and after blasting operations, blasted rock material will be pushed by bulldozers and other excavation equipment a short distance from the diversion channel area to the diversion dike foundation area for use in dike construction. The diversion dike location is shown on Figure 3.5-1. The excavated material is estimated to have 30 percent greater volume than the in-place rock, or a total of about 319,000 cubic yards. In order to contain 319,000 cubic yards of material within the existing channel geometry, the size of the diversion dike will be 75 feet high (crest at El. 605), 330 feet wide at the base, and 50 wide at the crest (see cross section on Figure 3.5-3).

Diversion dike design will include compacted rock within the geometry described above and will include a cutoff wall at the diversion dike toe (Figure 3.5-3). The 200-foot-wide by 3-foot-thick by 40-foot-deep soil-cement cutoff wall will be constructed to bedrock in order to prevent undermining and seepage of river flows below the diversion dike. As previously described, 1-foot and larger blasted rock pieces will be used to armor the diversion dike face, which will encounter river flows during the PMF up to elevation 566 (MEI 2003), or approximately 39 feet below the proposed diversion dike crest.

3.5.5 PROJECT ACCESS AND IMPROVEMENTS

Project access for this alternative would follow existing routes to the base of the Dam (with minor improvements) and the Cachagua Route to the reservoir. Road access to San Clemente Reservoir would be established via Cachagua Grade. An existing Jeep Trail that extends from Cachagua Grade site would be improved to enable the mobilization of construction equipment to the Dam site and the reservoir, and to avoid major mobilization activities through San Clemente Drive and the Sleepy Hollow community. A new access road between the Jeep Trail and the reservoir would need to be constructed. Access to the left abutment of the Dam would be by the existing San

Clemente Drive and to either the "Low Road" or "High Road" which may require minor improvements. Access to the base of the Dam would be by the existing "Low Road" and the "Plunge Pool Access Road" which would also be improved.

Access from Carmel Valley Road to San Clemente Dam

Existing vehicle access to SCD and the CVFP from Carmel Valley Road is described in Section 3.2. Improvements to these existing access roads are also described in Section 3.2.

Minor improvements may be made to the "High Road" (crossing a ford over the Carmel River) or "Low Road" (using an existing bridge across the river at the OCRD). These roads may require localized grading and/or widening, cut or fill slope stabilization, and vegetation removal. However, no major improvements are contemplated since the primary access to the reservoir will be via Cachagua Grade as described below.

Improvements to the existing unimproved single lane road from the OCRD to the plunge pool at the base of the Dam are also described in Section 3.2. This plunge pool access road would need to be improved to place the downstream cofferdams and stage the crane and other construction equipment used in demolition operations at the base of the Dam.

Access to the Reservoir

The primary access used to access the reservoir, construct the bypass, and relocate sediment from the San Clemente Creek arm to the Carmel River arm would be via Carmel Valley Road and Cachagua Grade. An existing unpaved jeep road, with entrance off Cachagua Grade approximately three miles from the intersection with Carmel Valley Road, would be used (see Section 3.3 for a description of this road and proposed traffic controls and improvements to it). The road profile is shown on Figure 3.5-4, including a new access road to the reservoir described below.

A new 0.5-mile-long access road would be constructed from the improved jeep road to the reservoir. A typical cross-section of the road is shown on Figure 3.5-4 along with a composite profile that includes Cachagua Grade. The road would be excavated along the slope of the ravine and would consist of a 15-foot-wide surface and 3-foot drainage ditch. The excavated slope above the road would be stabilized with small anchors, wire mesh and shotcrete as needed. The road surface would have 6 inches of Class II base rock installed. The road's travel surface would be sealed with a double chip seal coat. Fifteen-inch diameter or larger culverts with inlet structures would be installed at approximately 400-foot intervals for drainage.

3.5.6 RECONSTRUCTION OF THE RIVER CHANNEL AND REVEGETATION OF THE VALLEY FLOOR

As a result of the sediment removal efforts, the San Clemente Creek stream channel would be exposed and require reconstruction.

Removal of the reservoir sediment in the San Clemente Creek arm would expose the pre-1921 alluvial deposits in the river channel and floodplain through the historic reservoir inundation zone. A three-stage channel would be provided through selective contouring along San Clemente Creek. The channel is the conceptually the same as is described in Section 3.3, but will be longer and sized to convey the combined flows of San Clemente Creek and the Carmel Rivers.

3.5.7 CONSTRUCTION AND OPERATIONS

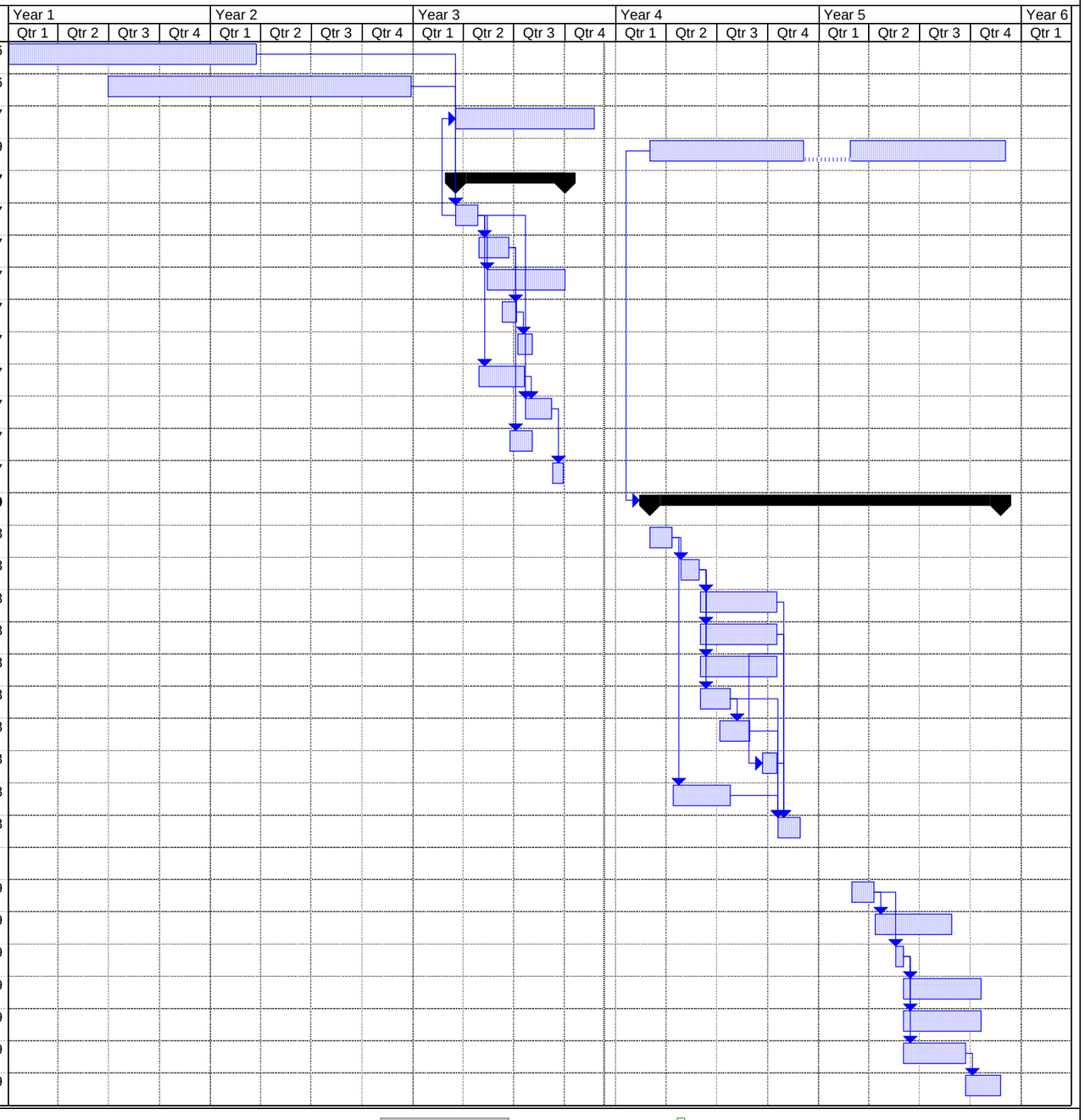
A conceptual schedule is presented in Figure 3.5-7. Following the State Notice of Determination and Federal Record of Decision, final engineering studies would begin in Year 2. These include geotechnical investigations for the sediment stabilization features and access roads; design of the access roads; design of the sediment pile including stability and hydrologic analyses; design of the new water intake and conveyance pipeline extension; planning for demolition of the Dam; planning and design of stream bypass and dewatering facilities; design of the bypass channel and diversion dike construction; design of the reconstruction of the San Clemente Creek channel; and design of mitigation or habitat enhancement plans for CRLF and steelhead. A construction contract package would be developed and construction bids solicited late in CY 1, for award early in CY 2.

Construction would occur in two distinct phases. Phase 1, in CY 3, would include mobilization, improvement of the existing access Jeep Trail from Cachagua Grade and construction of a new access road to connect the Jeep Trail to the reservoir. First year work may also include construction of a water diversion intake and temporary transmission line for CAW as well as some of the stream diversion features. It would conclude with demobilization for the winter.

Phase 2, CY 4 and 5, would include the construction of temporary roads across the reservoir sediment surface to allow access of excavating equipment, removal of sediment, blasting and construction of the bypass channel and diversion dike, sediment slope stabilization, demolition of the Dam; reconstruction of stream channels, and restoration and revegetation of the sediment pile and reservoir area. It would include seasonal mobilization, stream diversion, and reservoir dewatering, and interim stabilization of the sediment pile for the winter. The permanent water transmission line will be installed at an appropriate point in the construction process.

Figure 3.5-7 SAN CLEMENTE DAM SEISMIC SAFETY EIR/EIS PROJECT
ALTERNATIVE 3- CARMEL RIVER BYPASS & DAM REMOVAL
CONCEPTUAL SCHEDULE

ID	Task Name	Duration	Start	Finish
1	PERMITTING	320 days	Mon 1/3/05	Fri 3/24/06
2	ENGINEERING DESIGN	390 days	Fri 7/1/05	Thu 12/28/06
3	SH &CRLF MIT MONTORING PHASE 1	180 days	Mon 3/19/07	Fri 11/23/07
4	SH &CRLF MIT MONTORING PHASE 2	399 days	Mon 3/3/08	Thu 12/3/09
5	**PHASE 1**	**141 days**	**Mon 3/19/07**	**Mon 10/1/07**
6	MOBILIZATION	30 days	Mon 3/19/07	Fri 4/27/07
7	SET-UP STREAM DIVERSION	40 days	Mon 4/30/07	Fri 6/22/07
8	INSTALL CAL-AM'S WATER DIVERSION INTAKE AND TEMPORARY PIPELINE	100 days	Tue 5/15/07	Mon 10/1/07
9	CLEAR AREA FOR DIVERSION CHANNEL BLASTING	20 days	Mon 6/11/07	Fri 7/6/07
10	BUILD CUTOFF WALLS	20 days	Mon 7/9/07	Fri 8/3/07
11	CLEAR & GRUB, GRADE HAUL ROAD TO DISPOSAL AREA	60 days	Mon 4/30/07	Fri 7/20/07
12	ACCESS ROAD UPGRADE	35 days	Mon 7/23/07	Fri 9/7/07
13	PREPARE SLOPE STABLIZATION AREA	30 days	Mon 6/25/07	Fri 8/3/07
14	DEMOBILIZATION	15 days	Mon 9/10/07	Fri 9/28/07
15	**PHASE 2**	**452 days**	**Mon 3/3/08**	**Tue 11/24/09**
16	MOBILIZATION	30 days	Mon 3/3/08	Fri 4/11/08
17	INSTALL DEWATERING SYSTEM	25 days	Mon 4/28/08	Fri 5/30/08
18	DEWATERING & CARE OF WATER	100 days	Mon 6/2/08	Fri 10/17/08
19	SEDIMENT EXCAVATION AND DISPOSAL	100 days	Mon 6/2/08	Fri 10/17/08
20	SLOPE STABILIZATION OF SEDIMENT	100 days	Mon 6/2/08	Fri 10/17/08
21	BLAST BYPASS CHANNEL	40 days	Mon 6/2/08	Fri 7/25/08
22	BUILD DIVERSION DIKE	40 days	Mon 7/7/08	Fri 8/29/08
23	RIVER RESTORATION	20 days	Mon 9/22/08	Fri 10/17/08
24	DRILL DAM ABOVE EL. 525 FT	75 days	Mon 4/14/08	Fri 7/25/08
25	DEMOBILIZATION	30 days	Mon 10/20/08	Fri 11/28/08
26				
27	MOBILIZATION	30 days	Mon 3/2/09	Fri 4/10/09
28	INSTALL CAL-AM'S PERMANENT WATER DIVERSION PIPELINE	100 days	Mon 4/13/09	Fri 8/28/09
29	INSTALL DEWATERING SYSTEM	10 days	Wed 5/20/09	Tue 6/2/09
30	DEWATERING & CARE OF WATER	100 days	Wed 6/3/09	Tue 10/20/09
31	RIVER RESTORATION AND SEDIMENT EXCAVATION	100 days	Wed 6/3/09	Tue 10/20/09
32	DAM DRILLING & DEMOLITION	80 days	Wed 6/3/09	Tue 9/22/09
33	DEMOBILIZATION	45 days	Wed 9/23/09	Tue 11/24/09



Project: SAN CLEMENTE DAM REMOVAL
Date: Mon 12/10/07

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
External Milestone
Deadline

The majority of the work in Phase 1 is planned to take approximately eight months between March and October during CY 3. Phase 2 is planned to take two years. During each of these years, mobilization would occur during the month of March. Fieldwork in the reservoir area would around April. Installation of temporary stream diversion and dewatering facilities would take about one month, with closure of the cofferdams on or about May 31. Fish rescue would continue until June 30. Drawdown of the reservoir would continue until about October. Actual channel excavation, sediment stabilization and excavation, and dam removal operations would take place during a five-month period from June through October. Removal of cofferdams and demobilization of in-stream construction operations would occur in November. Allowing for holidays and a few days of bad weather, it was assumed that each season would have approximately 100 working days of actual sediment-removal production operations.

Sediment excavation, transport and placement operations would be conducted in two 10-hour shifts, five days per week. (For computation of actual production, it was assumed that each shift would have one unproductive hour, that is, the 10-hour shifts would have nine hours of actual production.) The equipment for sediment excavation and transport can sustain an average rate of 300 cubic yards per hour with a peak capacity of 500 cubic yards per hour. The estimated sediment removal rate is about 380,000 cubic yards of sediment from the San Clemente Creek channel in about three months.

During the last year of sediment removal operations, sediment removal would be completed in September. The upper portion of the Dam would be demolished while sediment removal is being completed, and dam demolition and removal activities would continue into the fall and be completed in September. Removal of cofferdams and demobilization of in-stream construction operations would occur later in November.

Reservoir restoration and channel reconstruction activities would take place concurrently with sediment removal activities. This work would begin at the upstream end of the reservoir and progress downstream as new areas of the historical stream terraces and channel are uncovered. Additional time would be needed at the conclusion of the sediment removal, dam demolition, and cofferdam removal operations to complete the reconstruction of the river channel and the revegetation of the reservoir and sediment areas.

Construction Crews

Labor requirements affecting the number of vehicle trips to and from the site vary from an approximate average of 15 workers per day during Phase I (road construction and improvements scheduled for one season for approximately eight months), to an approximate average of 25 workers per day during Phase 2 (sediment excavation and disposal). A maximum of about 40 workers would be needed during July through October. Construction crews could be transported to work in car pools to minimize construction-related traffic.

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3.6 ALTERNATIVE 4: NO PROJECT

Section 15126 of the CEQA Guidelines clarifies that the "no project" analysis must discuss the existing conditions at the time the Notice of Preparation (NOP) is published as well as what could reasonably be expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services. Existing conditions are discussed topically in Chapter 4 of this EIR/EIS.

NEPA regulations require each Draft EIS to include an evaluation of the no action alternative (40 Code of Federal Regulations [CFR] 1502.14c). When the proposed action is a private applicant's project, the no action alternative describes what would occur without the federal agency's approval. Although it generally does not satisfy the project's purpose and need, its inclusion in the EIS is required by NEPA as a basis for comparison. For the purposes of this EIR/EIS, the "no action" and "no project" alternatives are the same, and are referred to as the "No Project" Alternative.

Under the No Project Alternative, the reinforcement of the Dam would not occur and the Dam would remain in its present condition. The fish ladder would not be improved and the OCRD would not be notched under the No Project Alternative. The rate and timing of flow releases into the Carmel River would continue to be negotiated annually with NMFS, the CDFG and MPWMD, as long as the reservoir remained operable. Retrofit construction impacts would not occur. The reservoir would fill up with sediment and sediment would eventually flow downstream naturally. The existing access road would remain unchanged under the No Project Alternative.

In light of mandate from DSOD to render the Dam compliant with current seismic and PMF standards, it is highly unlikely that the No Project Alternative would occur. For the purpose of analysis, we are assuming that there would be no change to the current structures for the No Project Alternative. This is how the No Project Alternative was described in the September 2005 NOP. However, it is recognized that, in the absence of some measures to improve fish passage, one or more regulatory agencies could compel improvements ranging from upgrades to the existing ladder to full replacement of the ladder, measures to assure fish passage through the reservoir, as well as improved fish passage at OCRD. Impacts of such actions would be essentially the same as those described in Chapter 4 for the Proponent's Proposed Project. These actions were evaluated as part of the No Project Alternative in the Draft EIR/EIS, but have been removed from the Final EIR/EIS to allow the report to conform more closely to the intent of a No Project (No Action) alternative under NEPA and CEQA and to be consistent with the September, 2005 NOP.

The No Project Alternative would not meet the project purpose and need of increasing dam safety to meet current standards for withstanding a MCE and passing the PMF at the Dam. Interim dam safety measures would continue and seismic and flood hazard

risks would continue as described in Section 4.1. Effects on fish, as sediment fills the reservoir, are described in Section 4.4.

3.6.1 PROJECT LOCATION

See discussion in Section 3.2

3.6.2 EXISTING PROJECT FEATURES

See Section 3.2 for a description of the existing dam, access roads, fish ladder, and CVFP.

In 2003, DSOD required modifications to the Dam to meet interim dam safety requirements. Six ports were drilled through the Dam to allow seasonal drawdown of 10 feet to elevation of approximately 515 feet. The drawdown is timed to allow migratory fish passage. Each port was equipped with a trashrack to prevent large debris from entering the ports.

In 2004, a downstream fish passage system was installed to allow fish to exit the reservoir. The system consists of a borehole through the Dam (at 515 feet elevation) that connects a slide gate on the reservoir side of the Dam to a 14-inch pipe on the downstream side. The 14-inch polyvinyl chloride (PVC) pipe runs parallel to the fish ladder and discharges into the eighth pool in the ladder at an elevation of 513 feet. On the upstream side of the Dam is an adjustable weir, which provides surface spill into a box that then flows into the bypass system.

In addition, an Emergency Action Plan was developed in 2003 in coordination with the Carmel Valley Fire Department and the Monterey County Office of Emergency Services. Under this program, the Dam is monitored by an instrumentation system that automatically collects information about the Dam and river conditions, and transmits it to a Carmel Valley Emergency Operations Center and to the CAW Operations Center. Audible alarms indicate situations that require immediate attention. Instrumentation to monitor seismic activity and water levels at the reservoir, downstream plunge pool, and OCRB in addition to video surveillance were installed.

Sediment Management

This alternative would allow the reservoir to continue to fill rapidly with sediment and would allow uncontrolled spill of sediment over the Dam spillway within six to ten years. Sediment spills could result in significant downstream impacts as described in Section 4.4.

Water Diversion

Under the No Project Alternative, the existing water diversion from SCD to the existing downstream filter plant would remain unchanged. Water is diverted from the existing reservoir through the Dam's low-level outlet works to a nominal 30-inch pipeline routed

generally parallel to the low-access road (San Clemente Drive) to the CVFP downstream. The system depends upon a reservoir water elevation of 525 feet at the point of diversion to provide the required hydraulic head in the conveyance pipeline between the Dam and the downstream CVFP to drive the water through the existing filters to the clearwell for distribution. The clearwell, in turn, provides the hydraulic head for distributing the treated water into CAW's distribution system.

The maximum rate of diversion is 16 cfs, although summer diversions are not expected to exceed 3 to 4 cfs.

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FINAL Environmental Impact Report /
Environmental Impact Statement

San Clemente Dam Seismic Safety Project

volume 2, Chapter 4.0 - 6.0





January 2008



Prepared for

California Department of Water Resources
U.S. Army Corps of Engineers

US Army Corps of Engineers®

SCH 1 #997042007

CHAPTER 4.0

ENVIRONMENTAL SETTING, IMPACTS & MITIGATION MEASURES

FINAL

Environmental Impact Report
Environmental Impact Statement

for the

San Clemente Dam Seismic Safety Project

Prepared for

California Department of Water Resources

U.S. Army Corps of Engineers

Volume 2, Chapter 4.0 – 6.0

January 2008

4.0 ENVIRONMENTAL SETTING, CONSEQUENCES & MITIGATION MEASURES

This chapter provides a description of the existing environmental setting (affected environment) for the San Clemente Dam Seismic Safety Project, and describes in-depth environmental impacts in 14 resource and issue areas:

- Geology and Soils (Section 4.1)
- Hydrology and Water Resources (Section 4.2)
- Water Quality (Section 4.3)
- Aquatic Biology and Fisheries (Section 4.4)
- Terrestrial Biology (Section 4.5)
- Wetlands (Section 4.6)
- Air Quality (Section 4.7)
- Noise (Section 4.8)
- Traffic and Circulation (Section 4.9)
- Cultural Resources (Section 4.10)
- Visual Resources/Aesthetics (Section 4.11)
- Recreation (Section 4.12)
- Land Use (Section 4.13)
- Environmental Justice (Section 4.14)
- Other Environmental Effects (Section 4.15)

The effects of the San Clemente Dam Seismic Safety Project, including the Proponent's Proposed Project, project alternatives, and the No Project/No Action Alternative, are evaluated for all issues that could potentially include significant impacts. Specific impact issues are defined for each resource area and are designated by a unique alpha-numeric identifier. Impacts and mitigation measure(s) are discussed for each issue and the corresponding alternative under which it would occur. For example, the first issue in the Air Quality section is AQ-1 Dam Site Activities. Air quality effects and mitigation associated with dam site activities are discussed under Issue AQ-1 for each alternative.

Where alternatives have the same impact, the impact is described completely the first time it is mentioned; the other alternatives, with the same impact, refer back to the original impact description. Not all impact issues apply to all alternatives and the discussion also identifies those that do not apply. A corresponding mitigation is identified for each impact. Significance thresholds (Standards of Significance, or Significance Criteria under the California Environmental Quality Act [CEQA]) have been established to assess the adverse impacts of the Proponents Proposed Project and project alternatives. Each resource section includes the adverse impacts in a subsection entitled "Environmental Resource Impact Standards and Methods" which precedes the discussion of Impacts and Mitigation. Some impacts are identified as "beneficial." An adverse impact would be less than significant if the impact is less than the threshold. If mitigation can be applied to an otherwise potentially significant impact to reduce it below the threshold of significance ("less than significant"), the impact would be "significant, mitigable." If mitigation cannot reduce the impact to less than significant, it would be "significant and unavoidable." Significant unavoidable impacts are summarized in Chapter 5.0, CEQA & NEPA Considerations.

Where appropriate, impacts are described in terms of their duration. We define "short-term" impacts to be those effects that occur throughout the construction period (coterminous with the number of construction seasons, which vary from one alternative to another), do not endure beyond the construction period. "Long-term" impacts are effects that endure beyond the construction period, even if not permanent.

Impact assessment methodologies are described following the discussion of Standards of Significance for each resource area. Again, this discussion occurs under the Proponents Proposed Project and applies to all of the alternatives. Data and supporting technical reports are provided as appendices to this Environmental Impact Report/Environmental Impact Statement (EIR/EIS).

Following the California Environmental Quality Act CEQA, this EIR/EIS identifies the Proponents Proposed Project and its alternatives, including a No Project Alternative. Following the National Environmental Protection Act (NEPA), each alternative is analyzed in comparable detail. The impacts of all of the alternatives (Proponent's Proposed Project, Dam Thickening; Alternative 1, Dam Notching; Alternative 2, Dam Removal; Alternative 3, Carmel River Reroute and Dam Removal; and Alternative 4, No Project) are compared to one another and to existing conditions in the Project Area. To facilitate the understanding of impacts that occur over a period of time, an extended baseline environmental setting has been described for each resource area to the year 2030. This "2030 Baseline" describes environmental changes that are expected to occur over the next 25 years, and is intended to facilitate a more comprehensive analysis, considering trends and changes that may occur in the "existing conditions" baseline rather than comparing impacts to a snapshot moment in time. The 2030 Baseline is presented at the end of the environmental setting section for each resource area, before the environmental evaluations of the alternatives. The 25-year baseline period was

chosen to be long enough to allow reasonably foreseeable trends to emerge, but not so long as to become purely speculative. It has no relationship to “project life.”

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4.1 GEOLOGY AND SOILS

This section describes the potential impacts of the San Clemente Seismic Safety Project on geology and soils of the Project Area. Geology and soil resources include geologic, seismic, and soils characteristics influenced by the project. Additional information is provided in this Final EIR/EIS which clarifies and amplifies the information included in the Draft EIR/EIS. This environmental setting section was prepared using information developed from the documents provided by the Recirculated Draft Environmental Impact Report (Denise Duffy & Associates 2000) which information was originally developed for the New San Clemente Project (MPWMD 1984), The Mark Group (1995), Woodward Clyde Consultants (1992). Erosion control methods are outlined in the Storm Water Pollution and Prevention Plan (SWPPP) in Appendix K.

4.1.1 ENVIRONMENTAL SETTING

Geologic Setting

TOPOGRAPHY

The San Clemente Dam site is located in the northern Santa Lucia Mountains, within the Southern Coast Ranges geomorphic province. The Southern Coast Ranges province is characterized by a series of northwest trending mountains and valleys. The Santa Lucia Mountains are the most westerly mountain range in the Southern Coast Ranges Province, and extend from Monterey Bay southeastward for approximately 125 miles. The range is bounded on the southwest by the Pacific Ocean and to the northeast by the Salinas Valley.

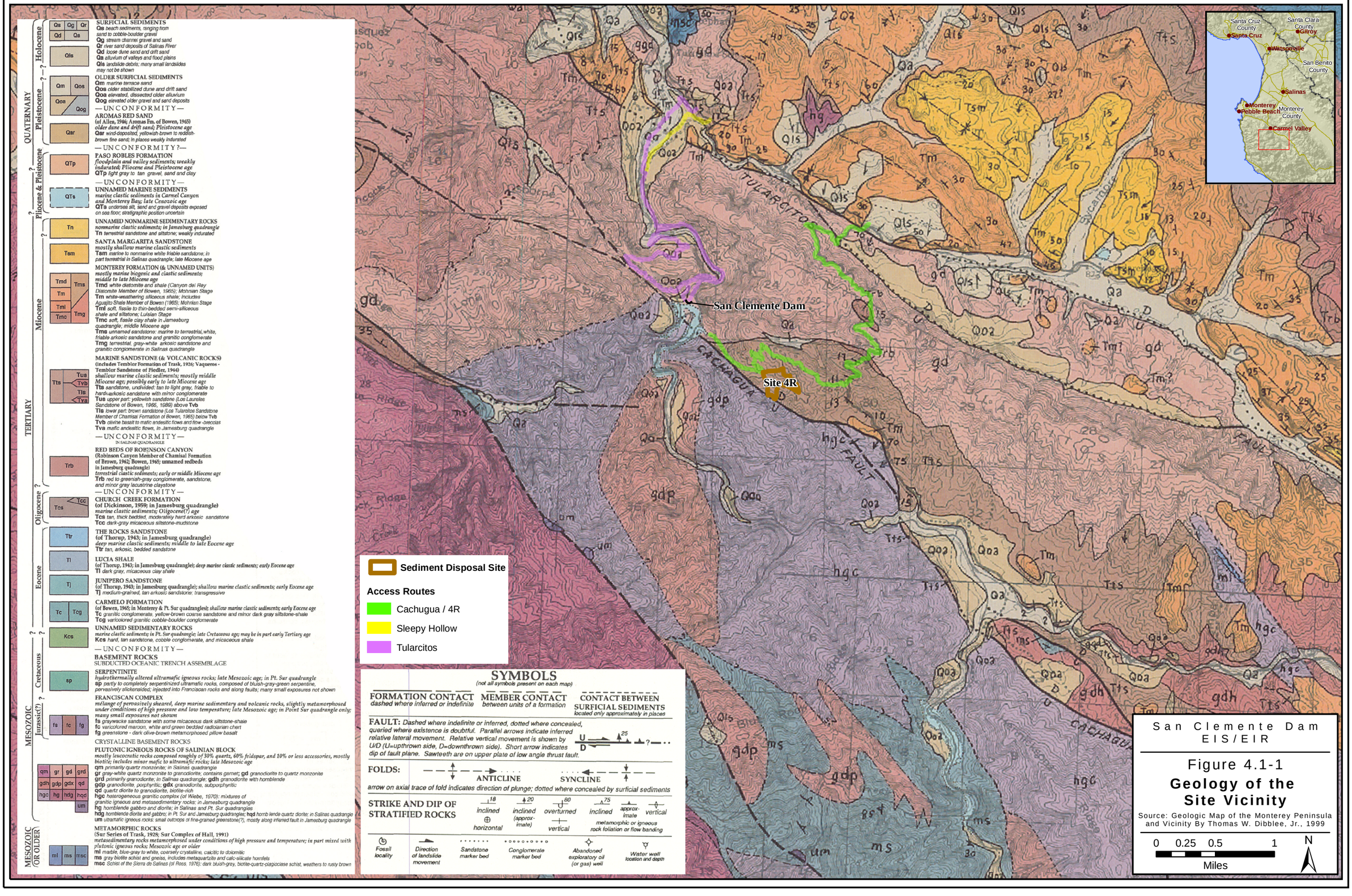
The topography of the region is characterized by high, narrow ridges, steep-sided hillsides, and incised drainages. Elevations in the northern portion of the range vary from approximately 800 feet at the confluence of the Carmel River and Cachagua Creek to nearly 4,800 feet. Slope gradients in the region are typically in the range of 45 to 90 percent (20 to 40 degrees), but vary locally from gently sloping on the surface of elevated stream terraces to near-vertical along the banks of incised canyons.

GEOLOGY

The Santa Lucia Range is the largest of several northwest-trending mountain ranges of crystalline basement complex known as the Salinian block. The Salinian basement complex underlies most of the Southern Coast Ranges geomorphic province, and is primarily composed of granitic rocks with local inclusions of metamorphic rocks. It is bounded by two major fault zones: the San Andreas Fault on the northeast, and the Sur-Nacimiento Fault zone on the southwest.

The major geologic units and structural features of the northern Santa Lucia Range in the Project Vicinity are depicted on Figure 4.1-1.

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The predominant geologic units in the vicinity of the San Clemente Dam are crystalline basement rock consisting of granodiorite, quartz monzonite, and a heterogeneous complex of mixed granitic and metasedimentary rocks. The broad belt of granitic rock is northwest-trending and extends to the Monterey Peninsula. The age of the granitic rocks in the area is considered to be middle to late Cretaceous (Compton 1966; Wiebe 1970, date not known with certainty, but approximately 100 million years old), while the metasedimentary rocks are older than the granitic rocks that engulf them.

Tertiary sedimentary rocks in the vicinity of the Dam site include three distinct formations. In order of decreasing age, these formations are referred to as: Unnamed Redbeds (Trb), Marine Sandstone (Tts), and Monterey Formation (Tm). The Marine Sandstone Formation is exposed along both the southern and northern margins of Cachagua Valley, and is in fault contact with the basement rocks along the Cachagua Fault, which strikes through the Dam site.

Quaternary (less than 2 million years old) deposits in the vicinity are unconsolidated stream terraces and alluvial fans that locally cover the crystalline basement, especially along the lower slopes and in drainages. The stream deposits, consisting of coarse gravel, sand and silt, include modern fluvial deposits located in the present river channel, as well as older, elevated terraces that were deposited as the ancestral Carmel River carved a channel through the mountains.

Seismic Setting

Tectonics and Structure

The Southern Coast Ranges geomorphic province is a region of active tectonism associated with movement of the Pacific Plate, on the southwest, relative to the North American Plate, on the northeast. The San Andreas Fault forms the boundary between these two tectonic plates, but movement occurs on additional faults over a broad region.

In a regional sense, the Salinian block generally is considered to behave as a rigid tectonic block (Dibblee 1976; Clark et al. 1974) during plate motions. However, the Salinian block can be divided into sub-regions on the basis of physiography and geologic structure and within which deformation is apparent. the Dam is situated in the northern Santa Lucia Range domain, which is the most intensely deformed sub-region of the Salinian block. In comparison to surrounding sub-regions, this sub-region is characterized by higher elevations, greater structural complexity, and an abundance of northwest-trending, "intra-Salinian" faults. Most of these faults are steeply dipping reverse faults that have disrupted the Tertiary rock record and elevated the mountain range. Quaternary activity is difficult to adequately assess for many of the intra-Salinian faults because of the relative lack of Quaternary deposits in the rugged interior of the northern Santa Lucia Range. Traditionally, geologists have considered the intra-Salinian faults incapable of generating significant earthquakes because these faults were formed under an older, compressional stress regime that has now been overshadowed by right-lateral transform movement (Dibblee 1976; Ross 1976). However, more recent analyses

indicate that certain intra-Salinian faults, such as the Tularcitos Fault in the vicinity of the project, may have experienced at least some amount of Quaternary movement (Clark et al. 1974, The Mark Group 1995). The type of deformation associated with the most recent movement along these faults is probably a combination of compression and right-lateral strike-slip movement (The Mark Group 1995).

Seismogenic Potential of Nearby Faults

San Clemente Dam is susceptible to earthquake shaking from several different sources. Table 4.1-1: Distance to Faults San Clemente Dam summarizes the distance from the San Clemente Dam to these faults, as well as the fault type. Not all of these faults are active; Table 4.1-2: Seismogenic Potential of Nearby Faults summarizes characteristics of active faults. The faults forming the margins of the Salinian block, the San Andreas Fault zone and the Sur-Nacimiento Fault zone, are clearly capable of generating relatively frequent, moderate to large earthquakes. In addition, some of the intra-Salinian faults appear to have a potential to generate significant earthquakes. Intra-Salinian faults in proximity to the Dam include the Cachagua, Tularcitos, Blue Rock, Miller Creek and Chupines faults (The Mark Group 1995). Fault activity in the immediate area of the Dam site has been thoroughly investigated (Rogers E. Johnson & Associates 1984a, 1984b, 1985a, 1985b). No active faults are known to pass through the Dam site, although a small cross fault connecting the Tularcitos and Cachagua faults or a fault sliver off the Cachagua fault may exist. If this fault does exist, no movement has occurred on it in the past 125,000 years (The Mark Group 1995).

Table 4.1-1: Distance to Faults San Clemente Dam

Fault Name	Fault Type	Distance (miles) and Direction
Cachagua	Reverse-oblique	0
Blue Rock	Reverse	4 SW
Miller Creek	Reverse	8 SE
Tularcitos	Reverse/Strike-slip	1.5 NE
Palo Colorado	Reverse-oblique	8 SW
Chupines	Reverse	5 NE
Sur-Nacimento	Reverse oblique	12 SW
Rinconada-Reliz-King City	Strike-slip	12 NE
San Andreas	Strike-slip	29.0 NE

Table 4.1-2: Seismogenic Potential of Nearby Faults[1]

Fault Name	Minimum Distance to Site (mi)	Estimated Maximum Earthquake Magnitude (local)	Estimated Peak Horizontal Acceleration 50th Percentile[(2)]
Tularcitos	1.25[(3)]	6.5[(3)]	0.70g[(3)]
Chupines	5	6.5	0.30g
Rinconada-Reliz	12	7	0.25g
San Andreas (central creep)	28[(3)]	8.0[(3)]	0.19g[(3)]

(1) Information in this table is taken from Converse Consultants (1982) and WCC 1992.

(2) Hypothetical accelerations based on predicted peak acceleration curves by Joyner and Boore (1981) except for Tularcitos and San Andreas faults, which used 5 attenuation relationships (WCC 1992)

(3) Maximum magnitude, distance, and peak acceleration taken from WCC 1992.

The seismogenic potential of significant nearby faults was previously evaluated by Geomatrix (1985), Bechtel (1988) as cited in Woodward Clyde Consultants (1992), Woodward Clyde Consultants (1992) and The Mark Group (1995) in order to assess the Maximum Credible Earthquake (MCE) and ground motions for seismic design considerations. Table 4.1-2: Seismogenic Potential of Nearby Faults summarizes the potential seismic load that earthquakes on nearby faults could impart to the San Clemente Dam site. The conclusions of these reports, and other previous work, are that the Tularcitos and Cachagua faults are the most significant faults in terms of seismic design because of their earthquake potential and proximity to the San Clemente Dam. However, there is compelling geologic evidence that the Cachagua Fault has not experienced significant movement in the past several tens to several hundred thousand years (The Mark Group 1995). Therefore, the Cachagua Fault is not considered active, and the Tularcitos Fault is considered to be the most significant seismogenic source for the Dam. Descriptions of the Tularcitos and Cachagua Fault zones are presented in the following sections, summarized from data presented by The Mark Group (1995).

Tularcitos Fault Zone

Indications of late Quaternary movement along the Tularcitos Fault zone include: (1) youthful geomorphic expression along individual fault traces in the Carmel Valley area (McKittrick 1987, The Mark Group 1995), (2) offset stream terrace deposits and colluvium of probable late Quaternary age, and (3) possible connection to the Monterey Bay Fault Zone (MBFZ), which appears to have been active in the past 11,000 years (Greene et al. 1973). Recently, a sample of charcoal from colluvium displaced by the Tularcitos Fault was radiometrically dated to be approximately 7,940 to 7,620 years old (reported in The Mark Group 1995). Thus, there is increasing evidence that the Tularcitos Fault has experienced movement during Holocene time (less than 11,000 years ago). In addition, plots of earthquake epicenters suggest a micro seismicity pattern roughly aligned along the Tularcitos-Navy-MBFZ trend (Cockerham et al. 1990).

Assessment of MCE for seismic design requires an estimate of fault rupture length and rupture area, both of which are based on total fault length. The total length of the Tularcitos Fault zone is difficult to assess, not only because of the discontinuous nature

of individual segments within the fault zone, but also because of the uncertainty associated with the potential that the Tularcitos Fault is connected to other faults mapped to the northwest and southeast. In general, the Navy and MBFZs, located to the northwest, have been included as part of the Tularcitos Fault zone, but the short, discontinuous fault segments located east of approximately longitude 121° 30' have not been included (The Mark Group 1995). The two primary segments of the Tularcitos Fault zone are discussed below:

Navy-MBFZ. Although some previous workers consider the Navy Fault to be independent of the Tularcitos Fault, there is no clear evidence that these faults are not connected beneath Carmel Valley. Published maps do not portray any geologic structures that clearly cross the MBFZ-Navy-Tularcitos Fault zone, and recent work (summarized in The Mark Group 1995) can be used to strengthen the argument that the Navy and Tularcitos faults may be connected. Thus, in the absence of data clearly demonstrating that the faults are not connected, and based on similar trend and sense of offset between the two faults, the Navy Fault and Tularcitos Fault are considered to be the same fault zone for the purpose of seismic hazard analysis. In addition, the Navy Fault has been considered to be an extension of the MBFZ for similar reasons (The Mark Group 1995).

Some workers have portrayed the Tularcitos Fault as a buried fault (concealed beneath Carmel Valley) that extends to the coastline and to Cypress Point (Bowen 1965 and 1969). To make that fault connection requires several abrupt bends in fault orientation, and supposedly includes a fault with an opposite sense of movement (Greene et al. 1973). Thus, this connection does not appear to be as likely as the Navy-MBFZ connection.

Seismic Potential of the Tularcitos Fault Zone. The Tularcitos Fault shows evidence of late Quaternary, and probably Holocene (less than 11,000 years old), movement. The potential connection to the Navy-MBFZ makes the resulting combined fault zone significant in terms of length, activity, and proximity to the San Clemente Dam.

Woodward-Clyde Consultants (WCC 1992) conducted an extensive study of the seismic characteristics of the Tularcitos Fault as it may affect the San Clemente Dam site. They used five different methods for estimating the magnitude of earthquake and ground motion estimates. The methods include Seed and Schnabel (1980), Joyner and Boore (1988), Campbell (1988), Sadigh (1987), and Idriss (1985, 1987) [all are referenced in WCC 1992]. The WCC (1992) study developed estimates for the median and standard deviation of peak horizontal accelerations in the free field at the Dam site from the MCE on the Tularcitos Fault (magnitude 6.5) and the San Andreas Fault (magnitude 8.0). The average of the five methods for the Tularcitos Fault was a peak horizontal acceleration of 0.69 g, and a value of 0.70 g was used for design purposes (WCC 1992). From the San Andreas Fault, the average of the maximum peak horizontal accelerations was calculated to be 0.19 g, much less than that caused by the Tularcitos Fault (WCC 1992).

Cachagua Fault

The Cachagua Fault is represented by a complex zone of steep, southwest dipping reverse faults that mark the southwestern edge of the Cachagua Valley. It passes through the San Clemente Dam site. Results from The Mark Group's study of the Cachagua Fault activity (1995) indicate that there is compelling geologic and geomorphic evidence that the Cachagua Fault has not experienced movement since at least the past 85,400 to 213,500 years. This conclusion is based upon the estimated age of Quaternary stream terrace deposits that cover, but are not offset by, the fault. Thus, the Cachagua Fault is inactive according to the criteria established by the California Division of the Safety of Dams

Other Faults

The activity and seismogenic potential of the Blue Rock and Miller Creek faults are not known; however, Buchanan-Banks et al. (1978) indicate that the Blue Rock fault has not been active in Quaternary time. The earthquake potential of both faults is overshadowed by the longer Tularcitos Fault zone.

Although unmapped faults may exist in the study area, their potential seismic impact at the site would not likely be greater than that of the Tularcitos Fault.

In addition, WCC (1992) calculated that an unlikely magnitude 8 earthquake on the San Andreas Fault would generate a peak ground acceleration of only 0.19 g, much less than the 0.70 g calculated for the Tularcitos Fault.

Reservoir-induced seismicity may occur at the site, but there are no recorded instances of this phenomenon greater than magnitude 6.4 (Koyna Reservoir, India 1967). Therefore, peak ground accelerations would be less than those calculated for the Tularcitos Fault.

Landslides

The seismically active Santa Lucia Range is prone to landslides. Relatively rapid uplift of the range leads to the deep, V-shaped canyons with sharp dividing ridges (Smith et al. 2004). Rosenberg (2001) assessed the Monterey County region for landslide susceptibility, including the Carmel River watershed. The study area includes landslide susceptibility ranging from moderate to high, particularly in the steep abutments of the Dam and downstream slopes. Landslides are also currently a significant source of sediment in the watershed (Smith et al. 2004). The largest active landslide in the Carmel subwatershed is located upstream of the San Clemente Dam (Smith et al. 2004). Rosenberg (2001) mapped and analyzed a large landslide located downstream from the San Clemente Dam near the trout-rearing facility in Sleepy Hollow.

A geological-geotechnical investigation was conducted at the site in conjunction with the design of the seismic retrofit (Woodward-Clyde Consultants 1998) and the abutments

were found to be stable. Road construction must take landslide formation potential in to account in the testing and design phase (Smith et al. 2004).

Soils

The soils in the vicinity of the San Clemente Dam consist of the Cieneba series, Junipero Sur Complex, and rock outcrop. The Cieneba series is typical of soils developed on steep mountain slopes consisting of grantic and metamorphic rock. The soils have very rapid runoff characteristics, and a very high erosion potential (USDA Soil Conservation Service [SCS] 1978).

The Junipero Sur Complex is also typical of soils developed on steep slopes. Like the Cieneba series, the Junipero Sur Complex soils have very rapid runoff characteristics, and a very high erosion potential (SCS 1978). Both soil types have low shrink-swell characteristics. The Junipero Sur Complex tends to be more corrosive to both steel and concrete than the Cieneba series.

River Bank Erosion

Sediment erosion, transport, and deposition are discussed in more detail in Section 4.2, Hydrology and Water Resources. Issues relevant to the geologic characteristics of the area are summarized in the following discussion.

The existing dams on the Carmel River currently trap all of the bedload and a portion of the suspended load produced in the upper watershed. The current trap efficiency of Los Padres Dam is estimated to be 72 percent; the trap efficiency for the smaller San Clemente Dam is currently estimated to be about 85 percent, but is projected to decline to about 35 percent by 2010 to 2015.

After completion of the San Clemente Dam in 1921, the portion of the Carmel River downstream of the Dam adjusted to the loss of bedload material by deepening its channel. As the river incised between 1921 and the early 1960s, an extensive riparian forest developed, protecting the banks from erosion, except at bends. By about 1940, the river channel had adjusted to the presence of San Clemente Dam. A considerable amount of riparian vegetation was lost during the 1976-77 drought; groundwater pumping during this time lowered the water table in parts of the valley. With the banks unprotected by riparian vegetation, the river adjusted to subsequent flood flows by eroding both the channel bed and banks. As a result of this process, the middle reach of the river between the Garland Ranch Regional Park and Schulte Road changed drastically from a narrow, deep, meandering channel with well-developed riffles and pools to a wide, shallow channel with eroded banks and an unstable bed.

Since 1980, the MPWMD has monitored the health and state of the Carmel River riparian corridor closely. A ten-year program was implemented in 1983 to restore stability to portions of the river that had suffered significant erosion and had become

seriously degraded in terms of wildlife habitat. Approximately $1.3 million was spent over the ten-year period for river restoration.

The sediment transport characteristics of the Carmel River and its tributaries have been studied extensively. The combination of the most severe drought on record in 1976-77 and an extremely wet period between 1978 and 1983 caused unusually high amounts of sediment to be discharged into the riverbed. Sediment measurements conducted during the wet period most likely reflect a short to medium term condition in which a large amount of sediment was moved. Many of the homes in Carmel Valley are built on a broad terrace deposited by large floods in 1911 and 1914 (Kondolf 1983). The terrace is a reminder that floods, sedimentation, and related channel stability are of serious concern seasonally to the communities downstream from San Clemente Dam. Refer to Section 4.2, Hydrology and Water Resources and its appendices for a comprehensive assessment of geomorphological conditions on the river.

Baseline 2030 Conditions

Geologic characteristics are not anticipated to change significantly between the present and the year 2030.

4.1.2 ENVIRONMENTAL RESOURCE IMPACT STANDARDS AND METHODS

Standards of Significance

In accordance with CEQA, agency and professional standards, a project impact would normally be significant if the project would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss injury or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides; or

- Result in substantial soil erosion or the loss of topsoil; or

- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, or potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

Impact Assessment Methodology

Geological information from The Mark Group (1995), Woodward Clyde Consultants (1995), Denise Denise Duffy & Associates, Inc. (2000), and other sources cited in this section was reviewed with respect to the Proponent's Proposed Project and the alternatives. Features of the Proponent's Proposed Project and the alternatives were also projected onto the geology map (Figure 4.1-1) and the soils map prepared by the USDA Soil Conservation Service (SCS 1978). These data were reviewed to identify potential issues regarding geologic hazards or potential issues associated with the soils

of the area. Based on this information, an assessment of the significance of geologic hazards based on the standards of significance above was made.

4.1.3 IMPACTS AND MITIGATION

The following impact issues have been defined for geology, seismic, and soils issues:

- GS-1: Ground Shaking (risk of dam failure due to seismic activity)
- GS-2: Access Route Landslides and Slope Stability (risk of oversteepened or weakened hillsides)
- GS-3: Reservoir Landslides and Slope Stability (risk of landslides into reservoir)
- GS-4: Soil Erosion (risk of erosion along access road improvements and in sediment disposal areas; sediment and rock discharge to streams)
- GS-5: Bypass Rock Removal by Blasting (alteration of existing topography due to blasting and rock removal)
- GS-6: Erosion at Left Dam Abutment (risk of erosion due to dam overtopping)

Proponent's Proposed Project (Dam Thickening)

Issue GS-1: Ground Shaking

Risk of dam failure due to seismic activity
Determination: ***less than significant, no mitigation required***

IMPACT

Seismicity is a relatively widespread geologic hazard to the project and alternative areas. Because the Proponent's Proposed Project lies within a high-risk seismic area, it likely would be subject to ground shaking during construction or continued operation.

MITIGATION

No mitigation is required for this impact as the San Clemente Dam Seismic Safety Project is designed to withstand a MCE, and peak ground accelerations, a condition that cannot be met by the existing dam. The project would meet the EIR/EIS purpose and need of eliminating the potential for dam failure during the MCE.

Issue GS-2: Access Route Landslides / Slope Stability

Risk of slides due to oversteepening hillsides
Determination: ***less than significant with mitigation, short-term***

IMPACT

Landslides could be triggered during the construction or operation of the Proponent's Proposed Project by oversteepening hillsides during the improvement of access routes.

These improvements may require notching into adjacent hillside slopes, which could increase susceptibility to a landslide.

MITIGATION

Prior to conducting access road improvements, a qualified geotechnical engineer or engineering geologist would survey all road rights-of-way to provide construction design specifications. To ensure slope stability, BMPs developed during design specifications will be implemented in addition to applicable ones identified in the SWPPP (Appendix K) that would avoid any potential for landslides. This would mitigate any impact to a less than significant level.

Issue GS-3: Reservoir Landslides / Slope Stability

Risk of slides due to oversteepening hillsides
Determination: ***less than significant, no mitigation required***

IMPACT

Under the Proponent's Proposed Project the reservoir would operate over a very limited range of elevations (from the bottom of the sluice gates at EI. 491 to the spillway crest at EI. 525). It is therefore unlikely that a landslide striking the reservoir would generate a large wave or waves that would overtop the Dam because the reservoir has been largely filled with sediment. The shallow reservoir also would minimize the potential for seepage pressures to destabilize the rock mass around the reservoir rim.

MITIGATION

No mitigation would be required for this impact.

Issue GS-4: Soil Erosion

Risk of erosion along access road improvements and in sediment disposal areas; sediment and rock discharge to streams
Determination: ***less than significant with mitigation, long-term***

IMPACT

As part of the access roadway modifications and improvements, blasting of canyon walls at select locations adjacent to the low and high roads would be required to widen roadways for equipment access. Road improvements immediately upslope of the river or where vegetation may be removed to accommodate road widening or new road construction could cause localized changes in drainage patterns, and these in turn could result in erosion and introduction of sediment or bits of rock into the stream channel. Construction along steep hillslopes and banks adjacent to watercourses could affect water quality by increasing turbidity or by introducing foreign materials and construction debris. Road construction activities could alter drainage patterns, initiate slope instability, accelerate erosion, and discharge sediments to stream channels.

MITIGATION

Potential soil erosion impacts would be mitigated to a less than significant level with implementation of standard erosion control methods and BMPs on both the upslope and downslope sides of all construction zones. No fill would be placed on steep canyon slopes directly above the river. Retaining walls would be used where road widening would occur immediately upslope of the river on steep banks. Erosion controls would be adequately sized and appropriately located. Drainage facilities and slope protection methods would function throughout the construction and revegetation period. Erosion controls that prevent soil or sediment from entering the river would be monitored for effectiveness, and maintained throughout the construction operations. BMPs would be customized to address site-specific conditions encountered on the steep slopes that adjoin the river.

Erosion control measures are included in the the preliminary draft of the Stormwater Pollution and Protection Plan (SWPPP) located in Appendix K. This plan may be further modified during permit consultation with the Central Coast Regional Water Quality Control Board (CCRWQCB) and other appropriate permitting agencies, including the Monterey County Planning and Building Inspection Department. CAW has incorporated these mitigation measures as part of the Proponent's Proposed Project (Specifications Section 01560 Environmental Protection and Special Controls, Sections 1.02 and 1.06, Woodward-Clyde Consultants, December 9, 1998). The agency approved specifications would require the contractor to submit measures included in the SWPPP (Appendix K) that includes, as a minimum, the following erosion control methods and procedures:

- Use of filter fabrics, berms, hay bales, and other means to control surface runoff and prevent erosion;

- Monitoring erosion control methods for effectiveness and maintenance of these methods throughout the duration of construction operations;

- Constructing fills and spoil areas by selective placement to eliminate surface silts or clays which may erode;

- Controlling surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation by holding the areas of bare soil exposed at one time to a minimum, and providing temporary control measures such as berms, dikes, and drains; and

- Inspecting cut slopes periodically to detect evidence of possible future slope failures, and possible rock raveling which could be hazardous to personnel working in the excavation area below.

Where blasting is conducted near the Carmel River or other sensitive habitats, a blasting mat would be placed over the rock walls in order to capture and direct flying rock debris to fall onto the existing roadway. In addition, temporary wall structures made

of wood and/or steel would be erected adjacent to the existing access road to contain blasted rock on the road.

Disturbed areas would be immediately revegetated upon completion of road improvements using permanent revegetation to replace trees, shrubs, and grasses. If there is insufficient time prior to the runoff season to permanently revegetate impacted areas, temporary erosion control and revegetation actions would be implemented for any winter season prior to completion of the project. Temporary over-winter erosion control and revegetation actions may include such methods as the use of geofabrics and hydroseeding to provide an annual ground cover until the spring growing season when more permanent revegetation methods should be implemented. Installation of any geotextile or mechanical over-wintering protection would be properly installed to prevent undermining or washout during winter rains (see also Mitigation Measures for Section 4.3 Water Quality and Section 4.5 Terrestrial Biology).

Issue GS-5: Bypass Rock Removal by Blasting

The diversion bypass would not be constructed under the Proponent's Proposed Project. This impact would not occur.

Issue GS-6: Erosion at Left Dam Abutment

This impact issue would not occur because the San Clemente Dam Seismic Safety Project is designed to avoid it. The Proponent's Proposed Project would meet the EIR/EIS purpose and need of eliminating the potential for dam failure due to erosion at the left abutment under a scenario where the Dam is overtopped by the Probable Maximum Flood (PMF).

Alternative 1 (Dam Notching)

Geology/Soils impacts and mitigation for Issues GS-1 (Ground Shaking), GS-2 (Access Route Landslides and Slope Stability), and GS-3 (Reservoir Landslides) would be the same as the Proponent's Proposed Project. Issues GS-5 (Bypass Rock Removal by Blasting) and GS-6 (Erosion at Left Dam Abutment) would not occur under Alternative 1.

Issue GS-4: Soil Erosion

Risk of erosion along access road improvements and sediment disposal areas; sediment and rock discharge to streams
Determination: ***less than significant with mitigation, long-term***

IMPACT

The impact potential would be the same as discussed for Impact GS-4 for the Proponent's Proposed Project, with the addition of the potential for erosion at the sediment disposal area if adequate soil erosion BMPs are not employed.

MITIGATION

Potential soil erosion impacts would be reduced to a less than significant level with implementation of the measures outlined for Issue GS-4 for the Proponent's Proposed Project. Additional erosion control measures would be employed at the sediment disposal area to minimize soil erosion during construction and post-construction periods to a less than significant level. Additional details are included in the SWPPP in Appendix K. These measures would include:

- Stripping and stockpiling of organic soils for use in subsequent restoration and revegetation of the site once sediment placement has been completed;
- Placing a culvert pipe along the ravine bottom the full length of the site to help manage storm waters and minimize erosion during construction operations;
- Placing the sediment in thin lifts and compacting the sediment;
- Placing the sediment with a stable side slope (average 2.75:1);
- Placing concrete debris from the Dam notching on the pile for long-term erosion protection at the toe of the pile and on the groins along the contact between the pile and the hillside abutments;
- Providing interim drainage and diversion of ravine flows (at the end of construction season);
- Stabilizing sloping sediment surfaces and other disturbed areas by installing erosion protection features such as erosion control mats, straw bales, and sediment traps along the toe of the pile and other disturbed areas (at the end of construction season);
- Providing sediment collection features such as silt fences, straw bales, and sediment traps along the toe of the pile and other disturbed areas; and
- Restabilizing the final graded surface with placement of the stockpiled topsoil, implementation of erosion control measures as described above, and revegetation with native plants and trees obtained from the site vicinity.

Alternative 2 (Dam Removal)

Geology/soils Impact Issues GS-1 (Ground Shaking), GS-3 (Reservoir Landslides), and GS-6 (Erosion at Left Dam Abutment) would not occur, since the Dam would be removed. Impacts and mitigation for Issue GS-2 (Access Route Landslides and Slope Stability) and would be the same as the Proponent's Proposed Project. Issues GS-5 (Bypass Rock Removal by Blasting) and GS-6 (Erosion at Left Dam Abutment) would not occur under Alternative 2.

Issue GS-4: Soil Erosion

Risk of erosion along access road improvements and in sediment disposal areas; sediment and rock discharge to streams
Determination: ***less than significant with mitigation, long-term***

IMPACT

The impact potential would be the same as discussed for Impact GS-4 for the Proponent's Proposed Project, with the addition of the potential for erosion at the sediment disposal area if adequate soil erosion BMPs are not employed.

MITIGATION

Mitigation measures would be the same as discussed for Alternative 1.

Alternative 3 (Carmel River Reroute and Dam Removal)

Geology/soils Impact Issues GS-1 (Ground Shaking), GS-3 (Reservoir Landslides), and GS-6 (Erosion at Left Dam Abutment) would not occur, since the Dam would be removed. Impacts and mitigation for Issue GS-2 (Access Route Landslides and Slope Stability) would be the same as the Proponent's Proposed Project.

Issue GS-4: Soil Erosion

Risk of erosion along access road improvements and in sediment disposal areas; sediment and rock discharge to streams
Determination: ***less than significant with mitigation, long-term***

IMPACT

The impact potential would be the same as discussed for Impact GS-4 for the Proponent's Proposed Project, with the addition of the potential for erosion at the sediment disposal area if adequate soil erosion BMPs are not employed.

MITIGATION

Mitigation measures would be the same as discussed for Alternative 1.

Issue GS-5: Bypass Rock Removal by Blasting

Topography alteration and safety hazards associated with blasting
Determination: ***less than significant with mitigation, short-term***

IMPACT

Blasting will alter the landscape by removing approximately 145 acre-feet of rock in blasting a 450-foot-long channel between the Carmel River and San Clemente Creek, approximately 2,500 feet upstream of the Dam. The area is not accessible to the public and has not been designated as a scenic viewshed; therefore the change to topography would be less than significant.

Blasting entails safety hazards including the potential to trigger landslides on adjacent unstable slopes.

MITIGATION

A blasting plan would be prepared as part of final design for construction that would summarize BMPs to be employed during all blasting activities in order to ensure safety and minimize potential damage from an associated landslide. Such measures would include (1) controlling of excessive vibration by limiting the size of charges and using charge delays that stagger each charge in a series of explosions, and (2) following procedures for safe storage, handling, loading, firing, and disposal of explosive materials. Preliminary blasting BMPs have been incorporated into the SWPPP (Appendix K). Implementation of additional measures in a complete blasting plan (to be required as part of final construction specifications) would reduce blasting-related impacts to a less than significant level.

The applicant will require the contractor to submit BMPs that meet measures specificied in the SWPPP (Appendix K).

Alternative 4 (No Project)

Geology/soils Impact Issues GS-2 (Access Route Landslides and Slope Stability), GS-3 (Reservoir Landslides), GS-4 (Soil Erosion), and GS-5 (Bypass Rock Removal by Blasting) would not occur under Alternative 4.

Issue GS-1: Ground Shaking

Risk of dam failure due to seismic activity
Determination: ***significant, unavoidable, long-term***

IMPACT

San Clemente Dam is sited within a high-risk seismic area. Under the No Project Alternative (Alternative 4), the Dam would not be removed or retrofitted to reduce the potential of dam failure from seismic-related hazards (including ground shaking). This alternative would not address concerns regarding dam safety under a MCE and would not remove the threats to human health and safety. Under the No Project Alternative, this impact would be significant and unavoidable.

MITIGATION

Under the No Project Alternative, no mitigation would be provided for dam safety or other geological/soils hazards.

Issue GS-6 Erosion at Left Dam Abutment

Risk of erosion at the left abutment due to dam overtopping
Determination: ***significant, unavoidable, long-term***

A subsurface investigation was conducted at the site in conjunction with the design of the seismic retrofit (Woodward-Clyde Consultants 1998). In general, the Dam abutments were found to be stable. However, on the downstream side of the left abutment, some potentially unstable rock blocks were mapped in an area subject to overtopping. Although some remedial measures to improve foundation rock performance were specified, none have been undertaken.

MITIGATION

Under the No Project Alternative, no mitigation would be provided for dam safety or other geological/soils hazards

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4.2 HYDROLOGY AND WATER RESOURCES

This section describes the potential impacts of the San Clemente Seismic Safety Project on the water resources of the Project Area. Water resources include hydrology, hydraulics, and sediment transport in the Carmel River and other watercourses influenced by the project. In response to comments, additional information is provided in this Final EIR/EIS, which clarifies and amplifies the information included in the Draft EIR/EIS. The following environmental setting section was prepared using information developed from the documents provided by the Recirculated Draft Environmental Impact Report (Denise Duffy & Associates 2000), MEI 2003, 2005, 2007a, 2007b), MWH (2005), and WCC (1997b). References to specific river reaches along the Carmel River downstream of the SCD are from MEI (2003) and are explained in Appendix G of this report, San Clemente Dam Screening of Sediment Disposal Sites.

4.2.1 ENVIRONMENTAL SETTING

For hydrology and water resources, the area affected by the San Clemente Dam Seismic Safety Project includes the CAW Monterey service area, the San Clemente Reservoir in the drawdown zone, and the channel downstream of the Dam that could receive higher flows or sediment transport during project construction or operation, including drawdown and dewatering.

Water Supply and Storage

SCD does not provide water storage for water supply (nor does it provide flood control); the facility provides a point of diversion for the CAW water system. This feature of the existing project is preserved under all project alternatives (under some alternatives this is accomplished by moving the point of diversion upstream on the Carmel River). This is a NEPA/CEQA objective or purpose for the project (see Section 1.4). The San Clemente Dam Seismic Safety Project does not affect water supply.

SCD originally impounded approximately 1,425 acre-feet (AF) of water at a spillway elevation of 525 feet. Until 1996, stop logs were added to the top of the spillway each spring to increase the total water storage by about 600 AF. Due to ongoing sedimentation, the reservoir storage volume has been reduced to approximately 100 AF, as measured from the spillway elevation. During all months, the reservoir passes all streamflow that enters the reservoir downstream to the Carmel River.

Ground Water Supply and Aquifer Storage

CAW has served the Monterey Peninsula since 1966. CAW water sources include wells located along the Carmel River, drawing from the Carmel Valley Aquifer (a source in continuity with the Carmel River), and from a network of eight wells located in the Seaside Basin, a source accessed by other water users and purveyors as well. In 1987, the CAW water production peaked at approximately 18,000 AF/year. Total water facilities include two small reservoirs on the Carmel River, Los Padres Dam, and San Clemente Dam.

The Carmel Valley Aquifer underlies the Carmel River, and presently supplies approximately 70 percent of the Monterey Peninsula's water through CAW's system. In 1995, the SWRCB found that water flowing in the aquifer located below RM 15 and in continuity with the Carmel River is actually a subterranean stream over which the SWRCB has jurisdiction. In Order 95-10, the SWRCB found that CAW was, in effect, diverting approximately 10,730 AF/yr from the Carmel Valley Aquifer without a SWRCB permit, and ordered CAW to develop and implement a plan to replace the water that it had historically diverted from the Carmel Valley Aquifer. This order affects 69 percent of CAW's historical water supply for its entire Monterey District. CAW was also ordered by the SWRCB to reduce pumping in the Carmel Valley by 20 percent from historic levels pending the pursuit and implementation of a replacement water supply.

Recent studies have shown that groundwater pumping in parts of the Seaside Groundwater Basin that supplies approximately 30 percent of the CAW water supply is being overdrafted. CAW therefore believes that it is prudent to reduce its pumping from the basin by at least 1,000 AF/yr. Therefore, CAW must replace a total of 11,730 AF/yr of its current water supply sources from the Carmel Valley Aquifer and Seaside Basin. Since 1995, CAW customers have managed to reduce water use on the Monterey Peninsula from more than 17,000 AF/yr to 14,000 AF/yr, a reduction of more than 20 percent. However, conservation efforts alone cannot adequately address the water demand and supply issues faced by the community.

Proposed Water Supply Projects

EIR/EIS Section 5.3 (Cumulative Impacts) describes several reasonably foreseeable future actions in the Monterey area related to water supply.

Prior to 1995, several water supply projects had been proposed by the MPWMD, the most recent being a New Los Padres Dam (NLPD). Although MPWMD had obtained key permits from the SWRCB and the United States Army Corps of Engineers (USACE) for construction of the NLPD, the MPWMD was unable to pass a bond measure to finance and construct it. CAW then proposed the Carmel River Dam and Reservoir Project (CRDRP), which was physically the same as NLPD but allocated water to releases to the Carmel River instead of to growth. There was considerable public and resource agency opposition to the proposed CRDRP and this project also failed to move forward.

On August 6, 1998, the California Public Utilities Commission (CPUC) issued a decision requiring CAW to prepare a long-term water supply contingency plan describing the program or combination of programs that CAW would pursue if the CRDRP could not be implemented (Decision 98-08-036 [1998] 81 CPUC2d 648). CPUC Decision 98-08-036 also required a short-term contingency plan that "shall include mandatory conservation, rationing, and…any other short-term measures to conserve or add to water supply."

Meanwhile, the Legislature passed and the Governor signed Assembly Bill (AB) 1182 (Chapter 797, Statutes of 1998), which required the CPUC to develop "Plan B," a long-

term water supply contingency plan as an alternative to the proposed dam for meeting the water needs of Monterey residents. The development of CPUC Plan B entailed identifying and analyzing potential water supply components and assembling alternative strategies according to their engineering, operational, economic, logistical, and environmental characteristics. The Plan B process culminated in the recommendation of an independent team of environmental and engineering consultants selected by the CPUC on how to best meet the water supply needs of the Monterey Peninsula and surrounding region. After a series of public hearings and workshops conducted by the CPUC, Plan B was suggested as the best alternative to the long-debated CRDRP. In 2002, CAW's internal review of Plan B led to a revision of its CPUC application for the CRDRP to propose a water supply project with two major components: seawater desalination, and aquifer storage and recovery (ASR).

To accomplish the objective of reducing its reliance on the Carmel River Aquifer and the Seaside Groundwater Basin, CAW has initiated the design, environmental analysis, and permitting of a new seawater desalination facility and aquifer storage project called the Coastal Water Project (CWP). The primary objectives of the CWP are to:

- Satisfy CAW's obligations to meet the requirements of SWRCB Order 95-10;
- Diversify and create a reliable drought-proof water supply for CAW's customers;
- Protect the Seaside Basin for long-term reliability;
- Protect listed species in the riparian and aquatic habitat below SCD;
- Protect the local economy;
- Avoid a potential building moratorium; and
- Minimize water rate increases by creating a diversified water supply portfolio.

Climate and Topography

CAW's Monterey service area is located in a semi-arid central California coastal area that is entirely dependent on local rainfall and groundwater for its water supply. Because of the geography and rainfall patterns, the area is prone to prolonged and severe droughts.

Topography within Monterey County ranges from sea level to an elevation of 5,844 feet at Junipero Serra Peak, located 12 miles inland in the Santa Lucia range. The Monterey County climate is generally characterized by warm, dry summers and cool, moist winters. The average temperature is approximately 56 ºF. Average rainfall in the County is approximately 15 inches per year, although rainfall in excess of 30 inches has been recorded. Measurable precipitation averages 51 days per year, and the average length of the growing season is 235 days.

Watersheds

There are two major watersheds that transverse Monterey County, the Salinas River Basin and the Carmel River Basin. The Gabilan and Santa Lucia Mountains are the water sources of the principal watercourses in the region. The Carmel River drains a watershed of approximately 247 square miles, originating in the north-western corner of Los Padres National Forest. The river travels north towards SCD and then flows in a north-northwest direction before emptying into the Pacific Ocean near the town of Carmel-by-the-Sea, California. SCD is located at the confluence of the Carmel River and San Clemente Creek, roughly 15 miles southeast of Carmel-by-the-Sea in Monterey County. Before entering the ocean, the river flows into the Carmel River Lagoon. For a portion of the year, the lagoon is closed by the formation of a sand barrier. The lagoon is open to the ocean in winter months when the river flow is sufficient to open and maintain the river mouth.

Flow patterns of the Carmel River are highly influenced by SCD and the upstream Los Padres Dam.

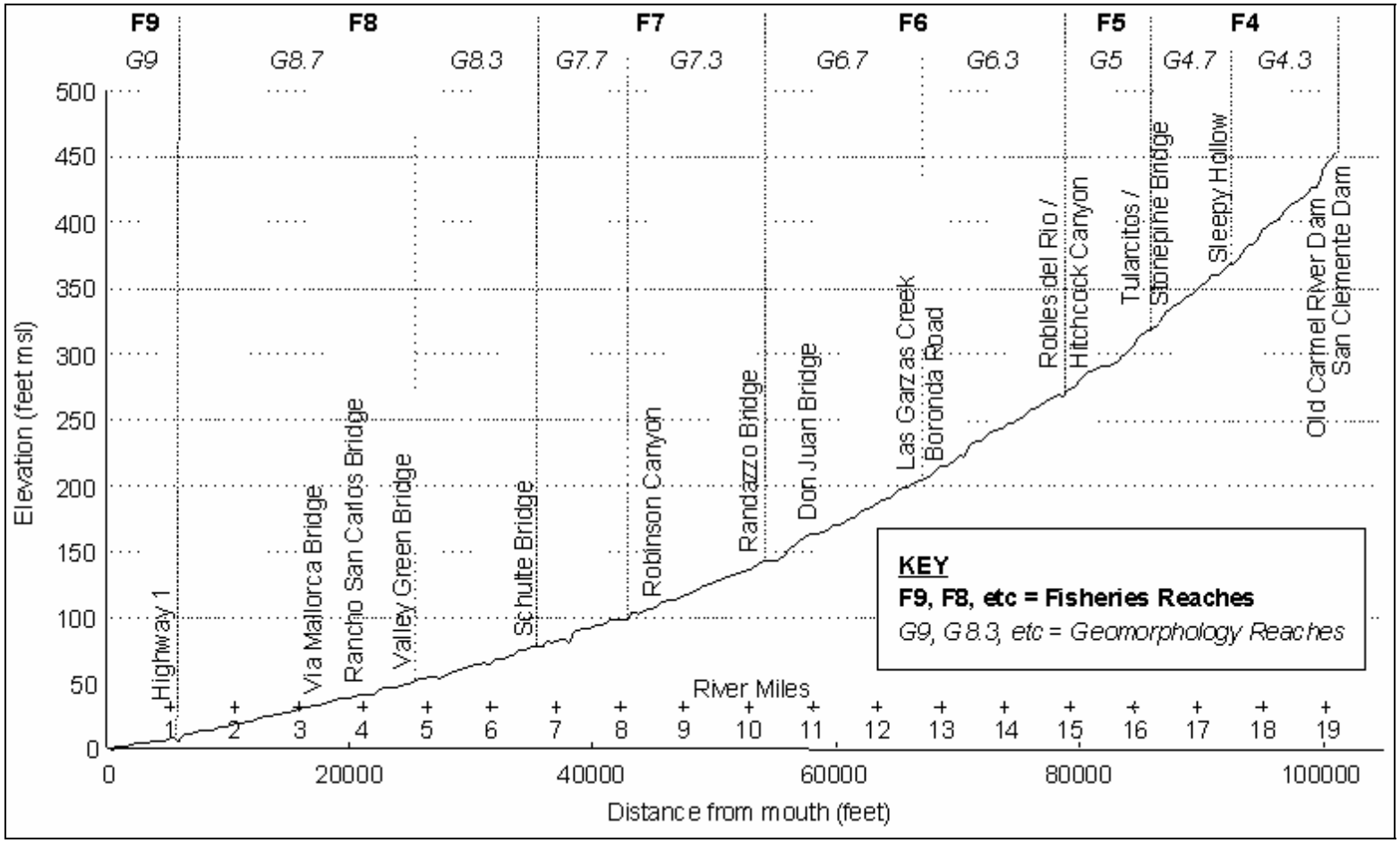
There are a number of smaller watersheds in the county, including the Laguna Seca sub-area watershed and the North County watershed. Drainage patterns in Monterey County have been altered by urbanization, resulting in increased runoff and a greater flood threat. The overall direction of runoff flow in the County is from south to north.

Carmel River Hydrology

The flow regime of the Carmel River is variable depending upon the season and the year. Over 90 percent of the average annual precipitation typically occurs between November and April, with January and February being the wettest months. During the dry summer months from May through October, the inflow to San Clemente Reservoir decreases. The lower reaches of the Carmel River, below SCD, may experience complete or partial drying of the river channel during these months because of groundwater withdrawals and low tributary inflow.

A United States Geological Survey (USGS) gaging station, Carmel River at Robles del Rio (USGS Station #11143200), is located downstream of SCD at subreach 5. Two larger tributaries join the Carmel River between SCD and the gaging station, Tularcitos Creek joins the Carmel River approximately 2 miles upstream of the gaging station and Hitchcock Creek joins just upstream of the gage (Figure 4.2-1). Although the Robles del Rio gaging station is not directly below the Dam, the recorded flows throughout most of the year are representative of the flows over the Dam and are therefore comparable for this analysis.

Figure 4.2-1: Longitudinal Profile of the Carmel River from the Ocean to San Clemente Dam



San Clemente Reservoir is filled nearly to capacity with sediment and has only minor space available to store incoming flows and sediment. The small remaining storage capacity of the reservoir (about 100 AF as measured from the spillway crest) has only minor effects on flows passing through the reservoir and will soon be filled by the natural yield of sediment from the watershed. Differences in discharge between gage flow and flow over the Dam may occur during large flood events and low flow periods, when the gage may over or under estimate the flows over the Dam.[1] Table 4.2-1 and Table 4.2-2 present the average daily flow and the peak of the average daily flow for a month for the period of record at the Carmel River Robles del Rio stream gage. Since 1985, low flow conditions along the lower reaches of the Carmel River have been improved by flow releases from SCD. Flows recorded at the Robles del Rio gage for the low-flow period are now fairly representative of the flows over the Dam.

Stream flow is also measured at the Carmel River Near Carmel gage (USGS Station #11143250), located about three miles east of Carmel-by-the-Sea. The station has monitored flow since water year 1963.

The average monthly flows over a 48-year record (Water Year 1948 to 2005) for the Robles del Rio gage range from 0 cfs to 2,308 cfs in February during wetter months. Flows during drier months, are less variable and range from 0 cfs to an average monthly flow of 410 cfs occurring in May.

Each year, a barrier forms at the Carmel River mouth by wave action, creating a closed lagoon. Under typical conditions, a flow of about 200 cfs is needed at the Carmel River Near-Carmel gage to facilitate opening the lagoon (Dettman 1989), and a flow of about 20 cfs at the Carmel River Near-Carmel gage is needed to keep the river mouth open. In order to provide upstream passage for adult Steelhead through the lower river (from Highway 1 to Robles del Rio), flows of about 45 to 75 cfs are required. These flows are necessary in order for passage to occur at several critical riffles (Dettman 1989).

SCD and Reservoir were never intended for flood control, and the project has neither flood storage nor flood operations criteria. The reservoir has only a minor influence on large magnitude flood events that flow into the reservoir.

The existing dam spillway has the capacity to discharge approximately 20,800 cfs. According to Department of Water Resources/Division of Safety of Dams (DWR/DSOD), during the PMF, the peak flood flow over the Dam would be approximately 81,000 cfs causing excessive scour and erosion around the Dam, and catastrophic failure.

[1] During high flow events, the gage would over-estimate flow over SCD because the gage would include contributions from the two tributaries, and the gage would under-estimate low flows at SCD because it would include diversions from the Russell Wells located upstream of the Tularcitos Creek confluence with the Carmel River.

Table 4.2-1: Average Daily Flow for a Month (cfs) for Period of Record (Water Years 1957-2005)

USGS Gaging Station: Carmel River at Robles Del Rio												
Water Year	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**
1957	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00
1958	0.3	0.6	14.0	86.0	579.3	636.2	1,071.3	97.4	38.4	9.3	1.7	1.1
1959	1.3	3.1	2.0	61.0	262.3	55.0	15.2	4.5	0.7	0.0	0.0	0.0
1960	0.0	0.0	0.0	7.4	174.7	37.9	18.0	11.8	0.3	0.0	0.0	0.0
1961	0.0	0.0	6.7	5.0	7.1	1.0	2.9	0.5	0.0	0.0	0.0	0.0
1962	0.0	0.0	0.0	0.4	416.9	235.5	56.1	19.8	2.9	0.1	0.0	0.0
1963	4.0	2.6	8.1	153.2	446.5	158.2	375.4	148.5	28.9	8.6	0.4	2.3
1964	2.2	50.0	20.7	107.0	61.6	30.7	32.4	13.5	2.3	0.1	0.0	0.0
1965	0.0	0.0	94.5	264.2	64.9	49.1	162.7	41.3	12.7	0.7	0.0	0.0
1966	0.0	13.5	74.6	99.6	103.9	34.9	7.9	1.1	0.0	0.0	0.0	0.0
1967	0.0	0.0	209.8	250.4	197.4	367.3	514.4	192.8	54.2	1.3	0.4	0.0
1968	0.0	0.0	0.6	6.0	50.4	33.0	15.7	1.0	0.0	0.0	0.0	0.0
1969	0.0	0.0	0.0	768.5	1,205.7	578.6	227.3	76.4	26.3	12.5	0.4	0.0
1970	0.0	0.7	19.8	312.5	106.6	267.8	46.5	25.8	5.5	0.3	0.0	0.0
1971	0.0	12.1	177.5	110.9	42.5	37.9	35.7	20.6	6.9	0.5	0.0	0.0
1972	0.0	0.0	36.2	38.6	51.1	4.0	8.7	0.1	0.0	0.0	0.0	0.0
1973	0.0	40.9	38.9	294.0	753.4	487.3	159.0	61.0	8.5	1.7	0.2	0.0
1974	0.8	17.4	102.7	253.4	77.6	478.7	309.7	72.7	14.7	4.1	0.5	0.2
1975	0.6	1.5	20.4	26.1	465.3	576.9	194.3	77.0	17.6	5.9	0.7	0.5
1976	0.7	1.4	1.5	1.4	1.4	3.5	1.1	0.3	0.0	0.0	0.0	0.0
1977	0.2	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1978	0.0	0.0	42.3	573.8	753.8	646.7	285.3	142.3	48.0	10.4	4.3	2.2
1979	4.1	12.7	19.8	84.1	212.3	200.7	162.6	59.3	11.6	5.6	1.4	0.3
1980	0.7	12.2	77.1	519.5	967.4	419.2	175.8	96.4	47.2	15.3	3.4	3.8
1981	4.4	1.7	15.1	148.6	84.5	217.5	96.2	32.7	4.6	1.6	0.7	0.8
1982	3.8	75.4	77.5	415.5	212.8	279.5	828.7	124.8	51.1	11.8	1.9	2.1
1983	2.2	80.9	396.3	744.7	922.1	1,854.5	705.8	409.9	129.1	50.9	13.4	10.6
1984	23.3	135.0	480.5	178.0	91.3	68.5	49.2	24.5	9.5	5.2	3.4	1.3
1985	2.5	29.9	50.6	24.0	61.0	94.9	58.0	15.0	6.1	4.5	1.2	2.1
1986	0.9	2.3	30.8	44.6	1,062.9	713.0	154.1	57.1	12.7	7.4	6.2	6.9
1987	5.7	6.5	7.6	8.2	78.5	65.8	17.0	3.8	3.1	1.5	0.9	1.1
1988	1.4	2.2	4.1	52.4	14.0	7.1	2.5	3.1	2.7	2.1	1.8	1.4
1989	1.8	2.4	6.1	6.4	11.7	53.9	12.4	8.1	1.0	0.9	0.8	1.3
1990	2.1	2.7	2.3	5.1	64.1	25.0	4.0	2.8	1.9	1.5	1.6	1.8
1991	2.1	1.3	0.1	0.3	0.4	282.6	74.8	16.3	8.4	3.2	2.3	2.5
1992	2.9	2.7	5.5	31.0	366.7	156.9	51.0	15.9	5.9	3.2	2.9	3.0
1993	3.1	2.8	17.0	704.6	606.8	295.7	111.9	41.8	33.2	10.5	4.8	4.7
1994	4.3	5.1	6.9	11.5	99.1	34.0	14.6	14.2	5.9	2.4	1.8	2.4
1995	2.8	3.0	4.0	867.8	173.4	1,033.2	203.3	138.2	74.2	27.9	8.9	9.5
1996	8.1	8.7	29.6	77.9	532.6	348.8	137.0	67.4	23.5	12.4	8.1	9.1
1997	7.8	13.2	247.1	898.9	285.4	87.2	46.0	21.9	13.0	11.3	8.4	5.5
1998	3.9	12.6	94.6	473.9	2,308.3	484.9	455.3	236.5	130.4	62.5	31.1	20.0
1999	23.6	37.3	54.7	80.7	232.2	152.7	209.6	69.9	32.4	13.3	6.8	7.2
2000	7.0	9.2	10.2	156.6	529.6	344.0	119.1	54.5	25.4	14.5	9.4	8.1
2001	13.4	15.2	13.6	82.8	172.9	314.2	82.9	48.8	22.3	10.3	5.9	5.7
2002	5.6	10.5	140.5	121.1	60.9	71.8	53.2	30.9	16.3	7.5	4.1	4.3
2003	4.6	41.8	273.8	206.9	76.0	94.0	118.6	104.7	40.0	18.5	11.2	9.1
2004	6.5	7.4	44.0	79.0	269.1	139.3	43.7	23.5	11.3	5.9	4.3	4.7
2005	7.9	17.3	133.8	521.1	404.1	413.3	213.9	103.4	49.8	21.5	13.2	10.0

ND = no data available for these months; data collection began August 1, 1957

Table 4.2-2: Peak Average Daily Flow for a Month (cfs) for Period of Record (Water Years 1957-2005)

USGS GAGING STATION: CARMEL RIVER AT ROBLES DEL RIO												
Water Year	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**
1957	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00
1958	0.6	0.9	46.0	725.0	1,590.0	1,600.0	4,800.0	160.0	65.0	25.0	2.5	1.9
1959	4.3	7.8	2.6	425.0	1,220.0	136.0	27.0	12.0	1.5	0.0	0.0	0.0
1960	0.0	0.0	0.0	28.0	585.0	60.0	80.0	31.0	1.9	0.0	0.0	0.0
1961	0.0	0.0	14.0	18.0	16.0	8.4	14.0	1.3	0.0	0.0	0.0	0.0
1962	0.0	0.0	0.0	4.8	1,820.0	862.0	106.0	31.0	8.0	0.5	0.0	0.0
1963	24.0	3.9	22.0	3,670.0	2,900.0	564.0	994.0	272.0	82.0	24.0	1.0	19.0
1964	4.3	352.0	34.0	592.0	124.0	65.0	92.0	30.0	18.0	0.4	0.0	0.0
1965	0.0	0.0	452.0	1,040.0	105.0	92.0	322.0	91.0	35.0	3.1	0.0	0.0
1966	0.0	75.0	536.0	386.0	172.0	68.0	28.0	6.2	0.0	0.0	0.0	0.0
1967	0.0	0.0	2,850.0	1,510.0	730.0	1,950.0	915.0	413.0	116.0	2.1	0.7	0.2
1968	0.0	0.0	1.4	118.0	138.0	88.0	61.0	3.7	0.1	0.0	0.0	0.0
1969	0.0	0.0	0.0	3,960.0	3,220.0	1,970.0	414.0	116.0	48.0	31.0	0.7	0.2
1970	0.3	1.6	94.0	1,810.0	205.0	1,020.0	69.0	49.0	11.0	0.8	0.1	0.0
1971	0.0	200.0	779.0	170.0	64.0	125.0	50.0	29.0	14.0	2.5	0.0	0.0
1972	0.0	0.0	287.0	80.0	182.0	11.0	53.0	0.3	0.0	0.0	0.0	0.0
1973	0.0	294.0	54.0	1,250.0	2,280.0	996.0	276.0	88.0	16.0	3.1	0.4	0.0
1974	4.7	79.0	523.0	496.0	110.0	2,100.0	1,320.0	124.0	48.0	14.0	1.0	0.7
1975	3.2	3.1	71.0	39.0	2,890.0	1,760.0	311.0	116.0	44.0	14.0	1.1	0.7
1976	2.4	2.8	1.9	1.7	2.6	29.0	1.7	1.1	0.0	0.0	0.0	0.0
1977	5.0	0.0	0.7	5.5	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
1978	0.0	0.0	510.0	2,780.0	2,510.0	2,320.0	457.0	224.0	86.0	21.0	8.6	3.1
1979	23.0	90.0	44.0	463.0	866.0	736.0	385.0	82.0	37.0	12.0	2.4	1.0
1980	1.3	31.0	557.0	2,750.0	4,130.0	801.0	340.0	128.0	67.0	43.0	5.5	4.7
1981	8.8	1.9	79.0	1,340.0	279.0	634.0	195.0	50.0	10.0	2.3	1.1	3.1
1982	14.0	291.0	320.0	3,010.0	549.0	1,380.0	3,430.0	205.0	79.0	19.0	2.9	7.0
1983	15.0	914.0	2,910.0	4,120.0	2,780.0	6,260.0	2,700.0	1,050.0	183.0	87.0	26.0	36.0
1984	52.0	663.0	2,800.0	418.0	175.0	136.0	76.0	36.0	13.0	8.3	4.2	1.5
1985	3.7	321.0	98.0	37.0	354.0	268.0	141.0	24.0	10.0	9.2	1.7	2.6
1986	2.4	5.8	189.0	275.0	4,130.0	1,910.0	247.0	94.0	18.0	8.8	7.2	8.4
1987	6.6	7.4	9.5	12.0	947.0	161.0	45.0	13.0	3.5	3.6	1.2	1.4
1988	3.1	2.5	9.5	269.0	24.0	22.0	4.8	4.5	3.4	2.6	2.6	1.7
1989	2.4	3.4	31.0	17.0	28.0	201.0	42.0	16.0	2.4	3.4	1.0	1.8
1990	3.4	3.6	2.4	12.0	553.0	39.0	5.4	3.9	2.4	1.7	1.9	1.9
1991	2.9	2.9	0.4	1.7	1.3	1,440.0	202.0	22.0	16.0	7.0	2.7	2.9
1992	4.0	3.1	42.0	80.0	2,090.0	373.0	94.0	22.0	9.9	3.6	3.3	3.5
1993	3.3	3.1	197.0	3,270.0	2,140.0	677.0	180.0	67.0	79.0	20.0	5.5	4.8
1994	4.6	7.1	11.0	47.0	415.0	66.0	18.0	18.0	10.0	2.8	2.3	2.8
1995	3.5	4.0	4.8	5,720.0	374.0	6,500.0	398.0	194.0	102.0	53.0	10.0	11.0
1996	9.7	9.6	66.0	512.0	1,690.0	691.0	285.0	199.0	49.0	16.0	10.0	12.0
1997	8.6	38.0	930.0	2,650.0	692.0	125.0	58.0	30.0	18.0	13.0	10.0	6.4
1998	4.9	73.0	264.0	830.0	9,000.0	912.0	664.0	300.0	180.0	95.0	39.0	25.0
1999	32.0	67.0	115.0	194.0	1,080.0	437.0	426.0	109.0	49.0	20.0	7.6	8.0
2000	7.8	12.0	11.0	1,440.0	2,230.0	657.0	277.0	83.0	39.0	18.0	12.0	10.0
2001	28.0	20.0	14.0	437.0	359.0	1,730.0	138.0	67.0	30.0	15.0	7.7	6.8
2002	7.2	27.0	539.0	439.0	88.0	124.0	76.0	42.0	21.0	11.0	5.2	4.9
2003	5.6	275.0	1,240.0	502.0	101.0	305.0	309.0	174.0	55.0	24.0	13.0	12.0
2004	8.1	8.6	698.0	400.0	1,550.0	401.0	61.0	27.0	19.0	8.0	5.0	5.6
2005	17.0	20.0	2,060.0	1,740.0	1,410.0	1,290.0	354.0	138.0	66.0	33.0	17.0	12.0

ND = no data available for these months; data collection began August 1, 1957

Although dam failure inundation maps under a PMF have not been prepared, it is estimated that an area much larger than the current regulatory floodplain (the regulatory floodplain is based on a 100-year flow), would be inundated (Richard Olebe, pers. comm March 2006).

The capacity of the San Clemente Reservoir is insignificant when compared to the drainage area of 125 square miles upstream of the Dam. Therefore, the existing reservoir has an insignificant effect on routing any large flood event. Low-flows pass through the reservoir largely unchanged from current conditions.

Sediment Sources

Sediment inflow to SCD is influenced by watershed activities or events independent of this project that generate sediment loads. Events that add background (non-project related) sediment load are not affected by project alternatives and project alternatives do not modify these factors in the upstream watershed; each of the alternatives is assumed to be equally influenced by them. However, each of the alternatives must consider the total upstream sediment load as part of the sediment management plan for the lower river.

Typical watershed influences are:

- Natural erosion from runoff and high stream flow;
- Watershed perturbations resulting from floods or fires;
- Land use practices that alter vegetation or disturb the soil; and
- Los Padres Reservoir storage and release of water.

Upstream of the Dam, the Carmel River watershed is much larger than the San Clemente Creek watershed and delivers most of the sediment load that enters the reservoir. MEI (2003) estimated the inflowing sediment load to the reservoir to be on average 16.5 acre-feet per year (AF/yr). The Carmel River branch supplies the majority of this sediment at 15.2 AF/year (MEI 2003). San Clemente Creek provides an average of only 1.3 AF/yr. Sediment is currently stored in both river arms in the reservoir.

The sediment/water interface in the San Clemente Creek arm is located approximately 1,000 feet upstream of SCD. Accumulated sediment in the Carmel River arm approaches the upstream face of SCD at an elevation of about 515, ten feet below the spillway elevation. The accumulated sediment is distributed from the east abutment to the west side of the spillway. Sediment from the Carmel River has also begun to fill the San Clemente Creek arm of the reservoir. At the full reservoir pool (water surface elevation of 525), the sediment/water interface is located about 200 feet upstream of the Dam in the Carmel River arm (see Figure 4.2-2).

Figure 4.2-2: Sediment at the Upstream Face of San Clemente Dam during Drawdown Conditions



Note: Water surface Elevation is about 515.5 on January 24, 2007. Photo by Dave Norris. View is looking upstream on the San Clemente Creek arm from the east side of the spillway

A low flow channel has developed through the delta of stored sediment in both arms, progressing downstream to the reservoir pool.

Watershed perturbations, such as wildfire or landslides can cause substantial amounts of sediment to deposit into the river system. Currently, the majority of the bedload sediment from these large events upstream of the reservoir is deposited in the reservoir and is generally unavailable to the downstream river. Only the suspended load and fine sand is transported over the spillway to downstream reaches.

The transport capacity of the river is a function of the hydraulic conditions in the river and the flow, channel slope and cross-section, and sediment size. Sediment management actions at the Dam can directly influence the amount of sediment delivered to the lower river and indirectly affect local river hydraulics through sediment deposition or scour. Such actions can directly influence steelhead habitat in the lower river.

Prior to the construction of SCD, sediment moved downstream in response to hydraulic conditions (streamflow) and sustained habitat for aquatic invertebrates and fish. Construction of the Dam caused the loss of a continuous sediment supply and ended transport of the coarse bedload sediment fractions (e.g., sand, gravel, cobble and boulder), to the lower river. As a result, downstream habitat degraded as the river continued to move sand, gravel and some cobble further downstream.

These dynamics have modified the channel downstream of SCD. In Reach 4.3, the bed is now composed mostly of cobble and boulder, and very little gravel is present in the river downstream to about the confluence with Tularcitos Creek, which is the current primary source of gravel in the river. The creek provides sediment in varied sizes to the river, including large amounts of sand and gravel during wet-years. Therefore, differences in bed-load supply are most noticeable between SCD and Tularcitos Creek. However, fine sand from SCD may be noticeable downstream as far as River Mile 10 during dry-years, when Tularcitos Creek is not transporting high sediment loads.

Construction of SCD has altered sediment delivery to the river from the Dam to the ocean. As a consequence of the 86-year loss of sediment contributions from the upper watershed, the bed of the river in the Carmel Valley has incised. Downstream land-use has also encroached onto the floodplain, and in some cases, has shortened the river course or restricted the width of the floodplain, reducing the storage capacity for floodwater and sediment deposition in the floodplain. These are existing conditions, not impacts of the present project.

2030 Baseline Conditions

As explained in the introduction to Chapter 4.0, an extended baseline environmental setting has been described for each resource area to the year 2030. This “2030 baseline” describes environmental changes that are expected to occur over the 25 years from the initiation of the EIR/EIS, and is intended to facilitate a more

comprehensive analysis, considering trends and changes that may occur in existing conditions over time.

Baseline hydrology would not change over the 25-year period. However, important changes would occur in baseline conditions for sediment transport. The project has accumulated an extensive history of sediment analysis conducted to better understand this dynamic baseline for impact assessment. Appendix M of this report provides a summary of that study history and the approach to sediment transport modeling upon which the environmental analysis presented in this EIR/EIS is based. This appendix defines key terms and concepts, including the "modified baseline", "wet" and "dry" year start to the hydrology, and subreaches used in the modeling. A wet-year start is when the 41-year hydrology is arranged to start with a wet-year and similarly with a dry-year. It also explains how sediment would be divided between the spillway and fish ladder.

To help better understand the 2030 baseline conditions, a summary discussion of how the baseline would be modified under each alternative is presented below so that the reader may more easily compare the alternatives to one another. The impacts of these differences are assessed in Section 4.2.3 for each alternative. Discussions of the remnant pool formed behind SCD, sediment storage in the reservoir area, and reservoir management and management of the upstream low-flow channel are also provided in this section.

Sediment Modeling Baseline

In addition to the 2030 baseline, specific sets of baseline hydrology were used in the sediment modeling. MEI modeled a baseline condition using a 41-year simulation of sediment movement. This baseline represents the condition with the Dam remaining in place. The simulation begins with an assumed 100 AF of storage remaining in the reservoir, which is approximately the condition of the reservoir today. The modeling baseline is therefore essentially synonymous with the 2030 baseline, although the modeling baseline extends out 41 years, a longer period than the 25-year 2030 baseline. However for convenience and to avoid a confusing multiplication of terms, the 2030 sediment modeling baseline is termed simply the "baseline" in the following discussion.

As the reservoir will "fill" with sediment (retaining only a remnant pool, as explained in Section 4.2.1) within 6 to 10 years, MEI developed a "modified baseline" to simulate the effects of sediment management actions under the Proponent's Proposed Project and Alternative 1. Under the modified baseline, the simulation begins with the remaining capacity of the reservoir filled with sediment, with only a remnant pool remaining. The purpose of creating the modified baseline was to allow all the alternatives to be simulated from a common starting point relative to the sediment load that would be available to the river downstream of the Dam. The modified baseline was used only for a single-year simulation (not for the extended period [41-year] hydrology). The term

"modified baseline" is used only when it is important to distinguish the use of it in the following discussions.

Comparison of Alternatives Modifications to the Sediment Baseline

Under the baseline, SCD remains in place, and both the Carmel River and San Clemente Creek would continue to contribute sediment to the reservoir throughout the baseline period. The average annual sedimentation rate for San Clemente Reservoir is 16.5 AF/yr (MEI 2003). Since sediment transport is tied to the duration and magnitude of flow, sedimentation rates would be higher in wet-years and lower in dry-years. There is presently about 100 AF of storage available in San Clemente Reservoir, and under the baseline condition, the reservoir would be expected to completely fill with sediment within 6 to 10 years (except for a small remnant pool, as discussed further below). The Carmel River is delivering the bulk of the sediment to the reservoir and the sediment front in the Carmel River has already approached the Dam. The sediment front on the San Clemente Creek arm is several hundred feet from the Dam.

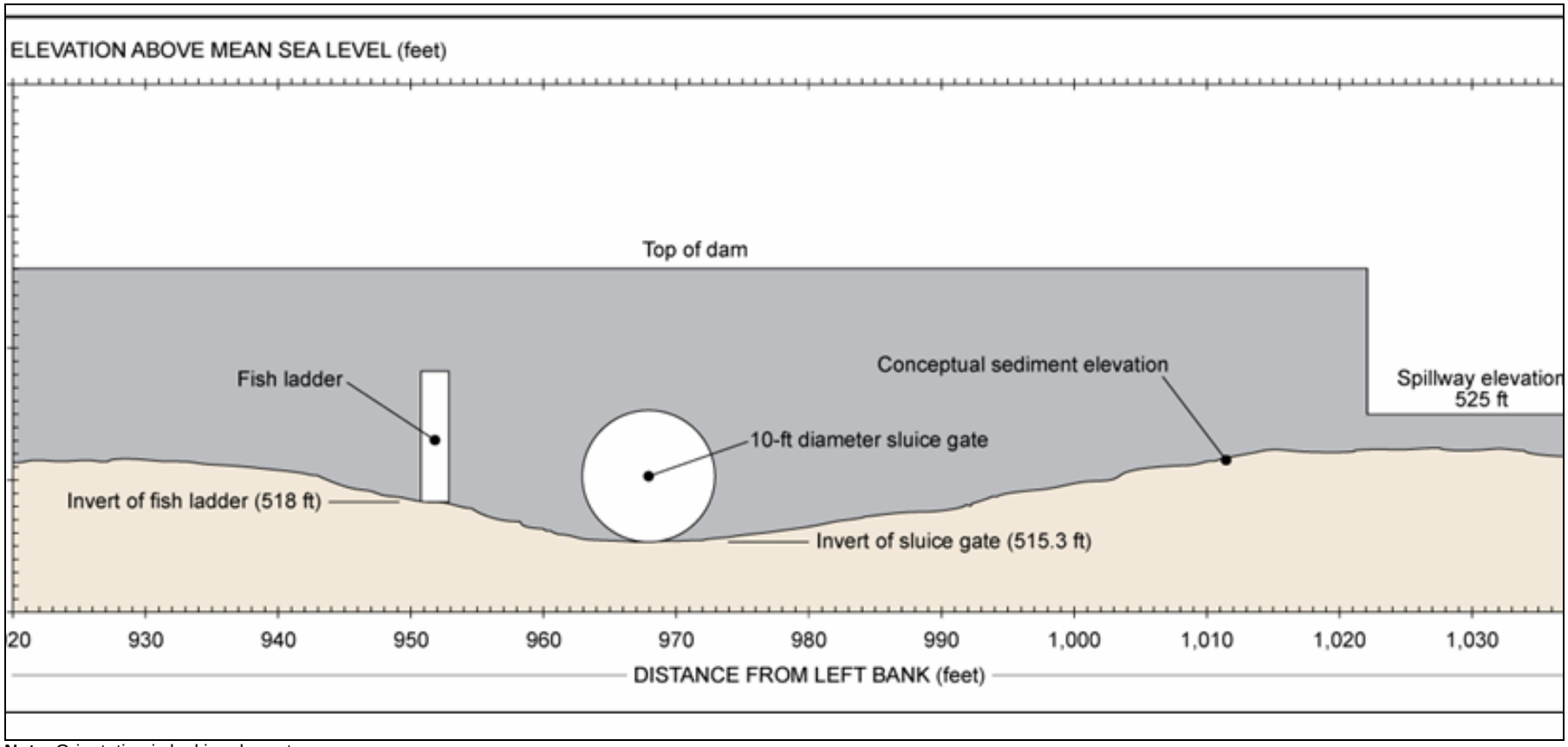
The baseline describes conditions that would characterize the No Project (No Action) Alternative (Alternative 4), since it retains the Dam as currently configured. Alternative 4 includes an annual drawdown for seismic safety under which the reservoir is lowered by 10 feet.[2] Annual drawdowns would continue under Alternative 4 until the reservoir is less than 50 AF in size, but would no longer be needed under the action alternatives. Drawdowns are part of the baseline against which the action alternatives are evaluated, but an annual drawdown is not part of any action alternative.

The Proponent's Proposed Project retains the Dam and varies from the modified baseline only through project operations (sediment management, including sluicing). Sluicing under the Proponent's Proposed Project would somewhat increase sediment released to the lower river above the levels simulated for the baseline condition. This is because operations under the Proponent's Proposed Project will maintain space near the Dam (as a result of sediment management) that temporarily stores new sediment flowing through the system from the watershed upstream. This sediment is removed from this temporary storage as necessary and sluiced downstream. As described in Section 3.2, sluicing is accomplished using a gate through the Dam that can be opened to release sediment and water. Figure 4.2-3 shows the configuration of this gate in relation to the fish ladder.

Alternative 1 would retain a notched dam and would also use sluicing and other sediment management tools.

[2] This occurs when flow at the Sleepy Hollow flow-monitoring gage is less than 30 cfs for three consecutive days after April 15. As required by the CDFG in 2006, future drawdowns would not occur until after May 31.

Figure 4.2-3: Sluice Gate and Fish Ladder Configuration



Note: Orientation is looking downstream
Adapted from MEI 2007a

This alternative modifies the baseline somewhat more extensively than does the Proponent's Proposed Project due to sediment excavation associated with dam notching.

Alternatives 2 and 3 remove the Dam, extensively modifying the baseline sediment transport conditions. For consistency, the following discussion refers to the area upstream of SCD that is currently occupied by the reservoir as "the reservoir area" for these alternatives, even though Alternative 2 and 3 remove the Dam and reservoir.

Remnant Pool

At 16.5 AF/yr of sediment inflow, it would take six to ten years to fill the remaining 100 AF of the San Clemente Reservoir. As sediment continues to enter the reservoir, it will fill and eventually reach a point where most of the inflowing sediment is transported through to the lower reaches. Examples of remnant pools in other dams are shown in Figure 4.2-4.

It is important to understand that even under baseline conditions the reservoir will never be entirely "filled" with sediment. Although the elevation of the stored sediment would approach the spillway elevation of 525 feet, it would never quite reach and remain at this elevation. High flows over the spillway produce hydraulic forces immediately upstream of the Dam that disturb bed material, suspend sediment in the water column, and allow sediment to flow over the spillway. The depth of disturbance is a function of flow and associated hydraulic forces. Larger flows tend to cause a greater depth of disturbance. The re-suspended sediment leaves the reservoir and reduces the front to an elevation below the spillway crest. As a result, a remnant pool is always maintained upstream of the spillway.[3]

The sediment elevation upstream of SCD is projected to stay between 2 and 5 feet below the crest elevation of the Dam. The difference in elevation between the sediment near SCD and the controlling point is occupied by the remnant pool. The aerial extent of a remnant pool upstream of SCD would vary from year to year depending on the magnitude of flood flows, and how and where the high flow crosses the Dam. A theoretical section, profile and plan view of the sediment impoundment once it is "full" of sediment is presented in Figure 4.2-5.[4]

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[3] Such a remnant pool can be observed at other dams, such as Daguerre Point Dam on the Yuba River and Sunol Dam on Alameda Creek Figure 4.2-5). Both dams are "filled" with sediment, yet remnant pools are evident just upstream of the dam crests. These dams were designed with broad-crested weirs for which the entire width of the Dam operates as the spillway. At both dams, the stored sediment elevation never equals the spillway elevation.

[4] This figure shows impounded sediment as it would look under both the baseline and under the Proponent's Proposed Project. The figure includes a conceptual representation of the sluice gate, which would occur only under the Proponent's Proposed Project.

Figure 4.2-4: Examples of Remnant Pool Upstream of Dams

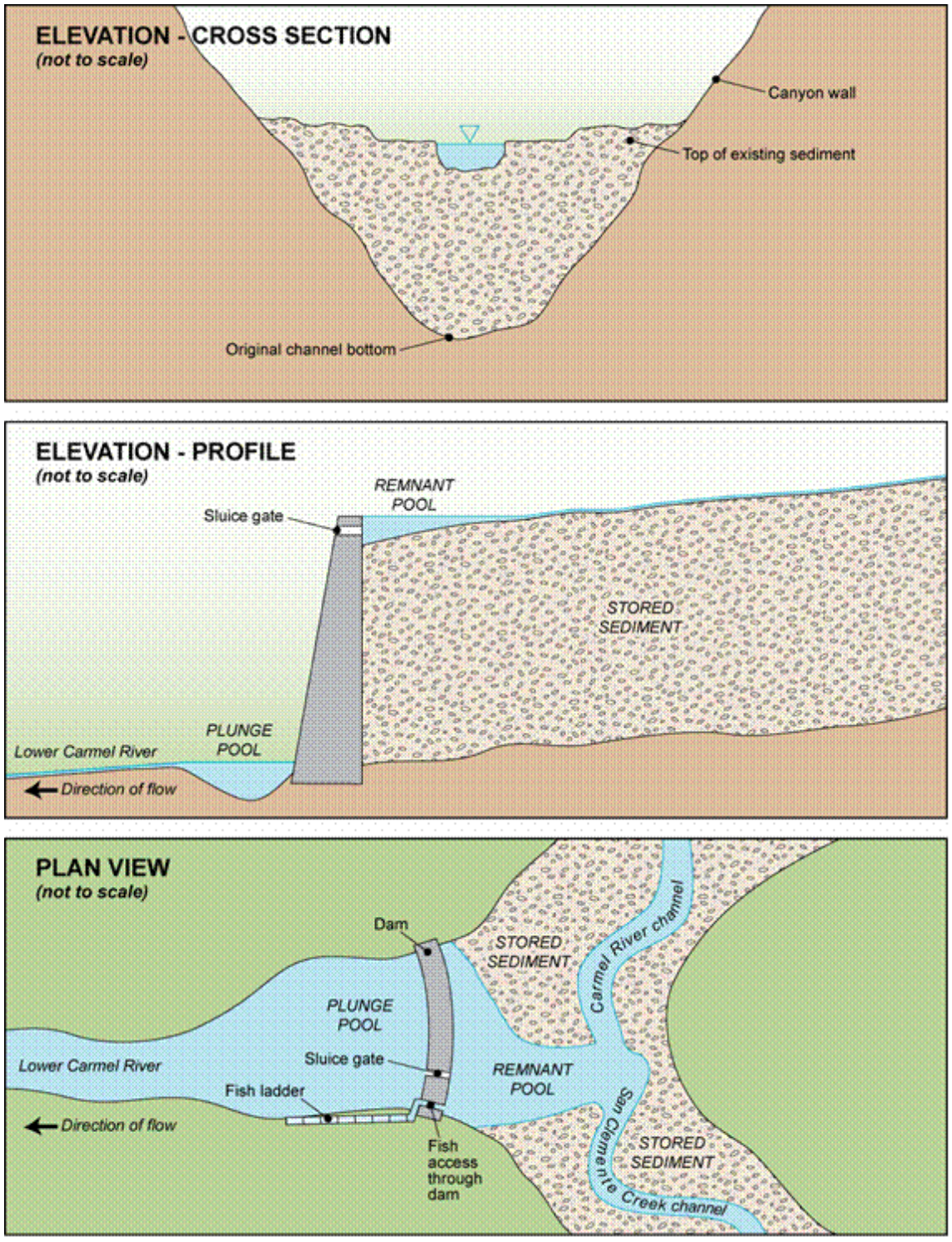


Daguerre Dam on the Yuba River



Sunol Dam on Alameda Creek

Figure 4.2-5: Conceptual Representations of the Impounded Sediment after Filling



The water surface elevation of the remnant pool is set by the controlling elevation at the Dam. This elevation may be the spillway crest, or other gates used to release water from SCD.

Sediment Storage in the Reservoir

The sediment stored behind SCD consists of fine sands near the face of SCD, coarsening gradually to coarse sands and gravels 2,000 to 2,500 feet upstream (MEI 2007b). The sediment gradation results from the reduction in channel bed slope through the stored sediment. Upstream of the stored sediment in the natural Carmel River channel, the bed slope is about 1.2 percent. Downstream through the stored sediment, the slope decreases to 0.09 percent (Appendix S). The natural bed slope of San Clemente Creek is about 2.5 percent and the slope of the sediment stored there is 0.38 percent.

As the slope flattens, sediment transport capacity is reduced. The largest sediments drop out first, while finer sediments are carried further into the reservoir towards SCD. The sediment gradation through the reservoir is shown in Figure 4.2-6.

Over time, as more sediment is deposited in the upstream end of the reservoir, the local channel slope would become steeper, increasing the sediment transport capacity. This in turn, would cause floodwater to carry coarser sediment further into the reservoir and reestablish the equilibrium of the channel. This would initiate a process of moving coarser materials further into the reservoir.

The stored sediment upstream of SCD extends from the spillway upstream through the former reservoir to a point that is outside the influence of the backwater of SCD. Currently, this point is about 7,500 feet upstream of SCD in the Carmel River arm, and 2,900 feet upstream in the San Clemente Creek arm. The channel at the upstream end of the reservoir on the Carmel River is comprised of gravel, cobbles, and boulders (Figure 4.2-7).

Figure 4.2-7 also shows the formation of a riparian corridor along the river channel. This corridor is forming throughout the former reservoir and is observed within 1,000 feet upstream of SCD.

Reservoir Management and Low-flow Channel

Each year since 2003, during spring or early summer, the surface elevation of the water stored behind SCD is lowered to the drawdown ports at the elevation of 515 feet for seismic safety reasons. When this occurs, the Carmel River and San Clemente Creek each cut a channel through the stored sediment in response to the increasing slope of the water surface.

Figure 4.2-8 and Figure 4.2-9 are photographs taken two years apart at similar locations in the Carmel River. The photographs show the channel cut through the sediment and also show how the bed sediment coarsening has occurred between 2004 and 2006.

Figure 4.2-6: Sediment Gradation through Carmel River Branch San Clemente Reservoir

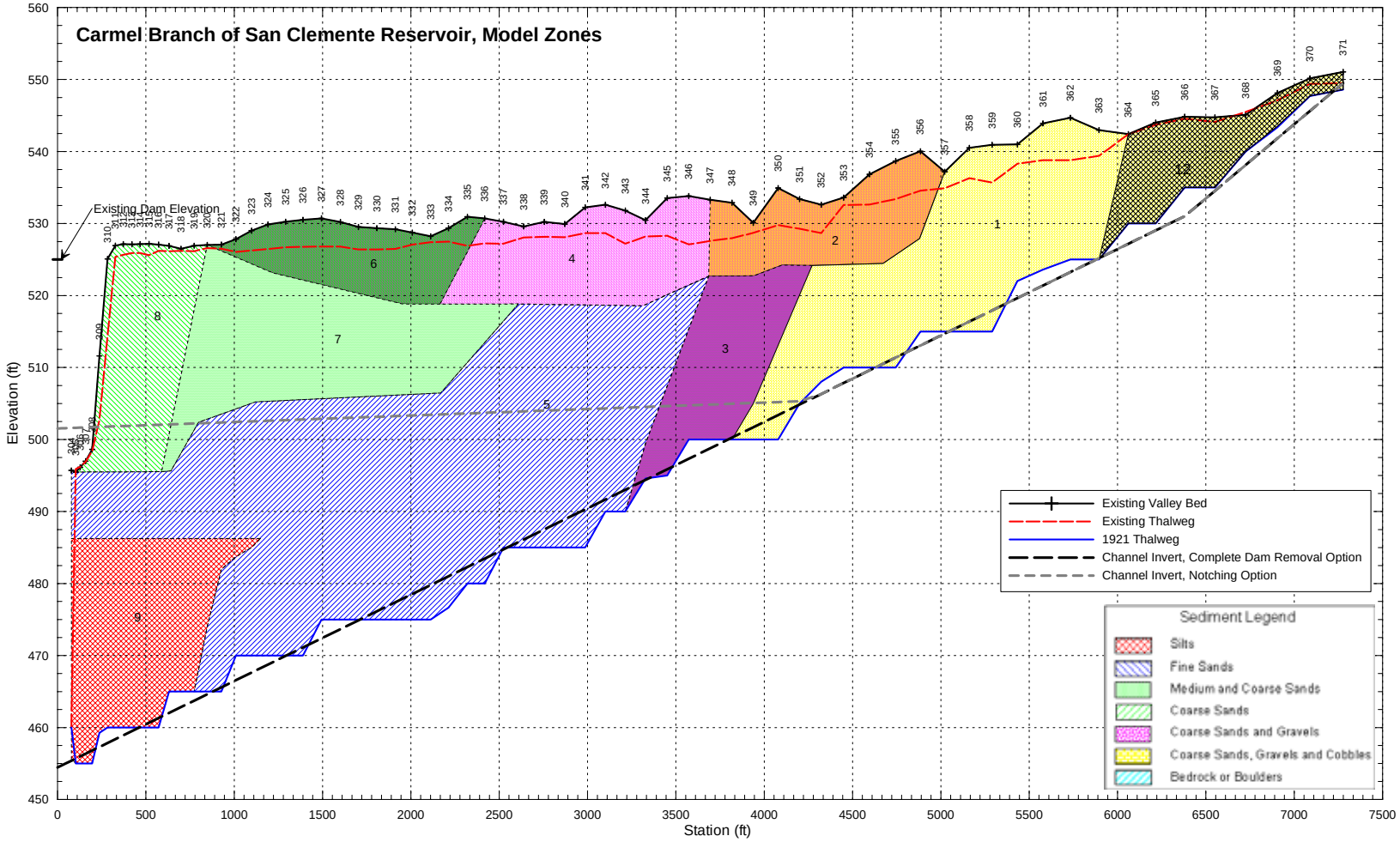


Figure 4.2-7: Carmel River Channel Showing Gravel and Cobble Bed Near the Upstream End of Inundation Zone



Photo Taken July 21, 2006. The flow measured at the Robles del Rio gage downstream is 13 cfs.

Figure 4.2-8: Carmel River in summer 2004, about 2,500 feet Upstream from San Clemente Dam



Photo Taken June 15, 2004, looking upstream through the reservoir. Vegetation established after 1996. The flow measured at the Robles del Rio gage downstream is 11 cfs.

Figure 4.2-9: Carmel River in summer 2006, about 2,300 feet Upstream from San Clemente Dam



Note: Coarser sediment (gravel)

In addition to demonstrating the coarsening of the channel bed, the photographs display a stable channel in low flow conditions. During the winters of 2004 to 2005 and 2005 to 2006, this portion of the channel was inundated in winter because the spillway elevation controls the water surface upstream of the reservoir and these locations are below the spillway elevation. Sediment is deposited in the reach in the high-flow months (November to May) in response to this flooded condition. During the summer drawdown, the lower water surface allowed a channel to cut through this material. After two years of this process, the relatively unchanged waterway demonstrates the size and shape of the characteristic channel for the inflowing sediment and hydrologic conditions. The figures show that channel has reformed over the two years in about the same place and with about the same cross-section.

These photographs also depict woody riparian vegetation that established in 1996 and was 10 years old at the time the photograph was taken. In 1996, the reservoir was operated for the first time without installing stop logs in late spring. Prior to 1996, the stop logs raised the water surface elevation in the reservoir, flooding the area in the figures, thereby preventing vegetation growth.

4.2.2 ENVIRONMENTAL RESOURCE IMPACT STANDARDS AND METHODS

Standards of Significance

Hydrology

An action would have a significant impact upon the local or regional hydrology if it would increase the chance of flooding or result in prolonged no-flow periods. For example, an increase in flood magnitude or frequency of flooding downstream of SCD would be a significant impact. For this impact, flooding refers to water leaving the channel to create a hazard to people or property. A significant impact to flooding would generally occur when flood elevations are increased by one foot or more over the base flood elevations as defined by the Federal Emergency Management Agency (FEMA) in the Monterey Country Flood Insurance Study. This one-foot increase is based upon FEMA's Flood Insurance Study criteria and is commonly used to define floodplain encroachment. The 1-foot change is assessed over a reach of river and not just at a single cross section. This is because exceedance of the one-foot criteria at a single cross section may result in localized flooding but exceedance over a reach would be an indication of regional flooding. In addition, changes in hydraulic characteristics (e.g., velocity) that would result in scour or deposition or increase flooding would be significant impacts.

Reservoir Storage

An action would be a significant impact on reservoir storage if it would increase the rate of sediment deposition or scour in the reservoir.

Sediment Transport

An action would have a significant impact upon sediment characteristics within the Project Area if it causes an abrupt change in sediment transport rate, volume of available sediment, or distribution of sediment. In addition, an impact would be significant if it increased sediment transport such that long-term deposition or scour of the Carmel River channel or floodplain would increase base flood elevations by one foot or more. Currently several reaches along the Carmel River are degrading due to lack of coarse sands and gravels (MEI 2003). Actions that increase in the delivery of coarser sediment to the downstream reaches would be a beneficial impact.

Water Supply

Three of the alternatives propose to move the water supply diversion point from the reservoir to a point about 6,000 feet upstream in the Carmel River. The water supply point of diversion will remain at its current location, within the influence of the reservoir for the Proponent's Proposed Project and Alternative 4. It is outside the influence of the reservoir for Alternatives 1, 2, and 3. A relocated point of diversion would take the historic diversion permitted under the existing CAW water right and would require approval of the SWRCB. Moving the diversion upstream would reduce river flow by the diversion amount in a longer section of river than the current diversion location.

Impact Assessment Methodology

Data for impact assessment were compiled from text, tables, and graphs provided by the DWR, Denise Duffy & Associates 2000, MEI Inc. (2003, 2005, 2007a, and 2007b), MWH (2005) and WCC (1997c).

Historical Flow Data

Historical flow data is available for the Carmel River at the Robles del Rio gage and is used to assess the potential for sediment management actions, including sediment sluicing. This historic hydrology is also used as input to the sediment transport model, the results of which were used to assess impacts.

Approach to Sediment Transport Modeling

Appendix M details the approach to sediment analysis and transport modeling. The sediment transport modeling used a HEC-6T simulation of the reservoir upstream of SCD and a HEC-6T model to simulate sediment transport in the lower Carmel River. This model used a 41-year hydrologic period based on measured flow data for the simulations. An independent sluicing model was developed to assess the effects of sluicing sediment past the Dam for the Proponent's Proposed Project. The model results for project alternatives were compared with the modeled baseline condition to assess impacts.

The results of the sediment transport modeling conducted for this EIR/EIS address:

- Total sediment load trapped upstream of SCD
- Total sediment load passing SCD to the Carmel River below the Dam
- Total sediment load stored in the Carmel River below SCD
- Daily suspended sediment concentration in the lower river
- Change in channel bed elevation in the lower river

The results of this modeling were used to help design the alternatives discussed in this Final EIR/EIS. Each action alternative provides for either sediment excavation and disposal off-site, or sediment stabilization in place. Stream restoration design upstream and through the dam site emphasizes the implementation of a geomorphically stable channel.

Model results were used to evaluate sedimentation in the reservoir and the need to manage sediment to maintain the fish ladder. The model results for downstream sediment loading were used to assess the potential to aggrade or degrade the channel bed and influence flooding. The deposition of gravel in the lower river would be a potentially beneficial impact for channel stability and fisheries habitat.

Calculated Suspended Sediment Concentration

The suspended sediment concentration was calculated from the downstream sediment loading results discussed above. A threshold of 500 parts per million (ppm) suspended sediment was used as an indicator of high concentration based on fish sensitivity to suspended sediment. This benchmark was used to organize the modeling results and the implications of the concentration are discussed in the Water Quality and Fisheries Sections of this report.

4.2.3 IMPACTS AND MITIGATION

The following impact issues have been defined for hydrology and water resources:

- WR-1: Changes in Stream Flow during Construction (Changes in streamflow downstream of the Dam during construction drawdown, dewatering the plunge pool, or when inflow exceeds the bypass capacity)
- WR-2a: Changes in Sediment Flow Passing SCD Immediately after Construction (Changes in the amount of sediment transported from the upper watershed (above SCD) to the lower Carmel River (below SCD) immediately after construction).
- WR-2b: Changes in Sediment Storage and Composition in the Lower River during Construction (Changes in the sediment composition of the Carmel River below SCD) (modified to clarify and amplify the impact issues in WR-3 and WR-4 of the Draft EIR/EIS to address construction related issues)

- WR-3a: Change in Sediment Deposition in the Reservoir (Changes in the amount of sediment deposited in the reservoir upstream of SCD) (modified to clarify and amplify the impact issue in WR-2 of the Draft EIR/EIS to address ongoing operational issues)

- WR-3b: Increased Sediment Deposition that Obstructs Fish Passage (During low-flow years, when all the flow is through the fish ladder, sediment would move close to the fish ladder, and possibly impair fish passage from the ladder to the remnant pool) (modified to clarify and amplify the impact issue in WR-2 of the Draft EIR/EIS to address ongoing operational issues)

- WR-4a: Increased Sediment Deposition in the Lower River (The increased sediment load passing SCD depositing in the Carmel River bed below SCD) (modified to clarify and amplify the impact issues in WR-2 and WR-4 of the Draft EIR/EIS to address ongoing operational issues)

- WR-4b: Increase in Frequency of High Suspended Sediment Concentrations (High flows will increase the sediment concentration in the river and sediment management activities, such as sluicing, would further increase the suspended sediment concentration downstream of the Dam*)* (modified to clarify and amplify the impact issue in WR-2 of the Draft EIR/EIS to address ongoing operational issues)

- WR-5: Changes in Channel Bed Geometry (Additional sediment passing the Dam to the lower river would aggrade or degrade the river channel or change the channel cross sections)

- WR-6: Changes to the 100-year Flood Elevation (The increased sediment loading would alter the bed of the Carmel River and influence the 100-year flood elevation)

- WR-7: Impact to the Location or Timing of Water Supply Diversions (Changes to the location or timing of water supply diversions)

- WR-8: Increased Risk of Dam Failure (Risk of dam failure due to seismic activity or flooding, leading to or increasing downstream flooding)

Based on comments received on the Draft EIR/EIS, additional sediment transport modeling was performed for this Final EIR/EIS. The modeling helped refine the understanding of the need for sediment management immediately upstream of the Dam and assisted in describing the impacts associated with the change in sediment loading to the lower river as a result of management actions. Furthermore, the modeling helped describe the magnitude of the changes in sediment flow because of the alternatives. Because of the improved understanding of the sediment flow that would result from the alternatives and the sediment management actions, hydrology and water resources impacts were reassessed and may now differ from those described in the Draft EIR/EIS.

The differences in impact issues described in the Draft EIR/EIS and in this Final EIR/EIS are as follows:

- A distinction has been made between the construction-related impacts (WR-1, WR-2a, and WR-2b) and the operational or continuing impacts (WR-3 through WR-6). The construction related impacts, which are usually short-term impacts, relate to effects during or immediately after construction and were evaluated from the sediment transport modeling results of the one-year simulation. Such impacts are primarily caused by disturbing the sediment upstream of SCD or by temporarily rerouting flow to bypass construction activities. The operational or continuing impacts which are usually long-term impacts relate to effects that could occur over years or decades and were assessed by evaluating the model results for the 41-year simulation. They are caused primarily by changes in flooding frequency or sediment loading as a result of a project alternative. They may be intermittent and temporary.

- In the Draft EIR/EIS, several factors were sometimes aggregated within a single impact issue. In the Final EIR/EIS, these impacts have been disaggregated and related back to the primary causative factor. Therefore, in the Draft EIR/EIS, Impact WR-2 (Changes in Sediment Flux Passing the San Clemente Dam Site) was described as including changes in sediment flow as a result of construction and as a result of sediment management to mitigate for fish passage problems from the fish ladder. In the Final EIR/EIS, WR-2a (Changes in Sediment Flow Passing SCD Site Immediately after Construction) only addresses the changes in sediment flow caused by construction. The additional modeling was used to clarify the magnitude of the impact and shows that for the Proponent's Proposed Project and Alternative 1, these changes are relatively small and were determined to be less than significant instead of less than significant with mitigation. For Alternatives 2 and 3, the impacts were determined to be significant and unavoidable instead of less than significant with mitigation.

- Impact WR-3 (Changes in Riverine Sediment Composition) and WR-4 (Riverine Sediment Storage) in the Draft EIR/EIS described both short and long-term impacts. These temporal impacts are now described separately in the Final EIR/EIS. The discussion of short term impacts of both of these impact issues are now in WR-2b (Changes in Sediment Storage and Composition in the Lower River during Construction). The additional modeling results were used to clarify the magnitude of this impact. Impacts for the Proponent's Proposed Project and Alternative 1 are now less than significant with mitigation instead of significant and unavoidable and impacts for Alternatives 2 and 3 would still be significant and unavoidable.

- In the Draft EIR/EIS, sediment management was viewed as mitigation to manage sediment to maintain the fish ladder. The updated sediment transport modeling was used to amplify the information in the Draft EIR/EIS and it was determined that under the Proponent's Proposed Project sediment management for fish passage would only be needed occasionally and not as a regular practice. Sediment management as presented in the Final EIR/EIS is an adaptive management tool that would be used when necessary to maintain passage from the fish ladder into the remnant pool. The discussion of the long-term impacts of sediment management in this Final EIR/EIS, including slucing, is found in WR-3a (Change in Sediment Deposition in the Reservoir), WR-3b (Increased Sediment Deposition that Obstructs Fish Passage),

WR-4a (increased Sediment Deposition in the Lower River) and WR-4b (Increase in Frequency of High Suspended Sediment Concentrations). In the Draft EIR/EIS, sediment management, including sluicing, was a significant and unavoidable impact for the Proponent's Proposed Project and Alternative 1. The results of the updated sediment transport modeling (and changes made to the SOMP to make it more adaptive for the Proponent's Proposed Project and Alternative 1) resulting in impact designations that are now either beneficial or less than significant for all action alternatives except for Alternative 2 under WR-4a and Alternatives 2 and 3 under WR-4b.

- In this Final EIR/EIS, Impact Issues WR-3a (Change in Sediment Deposition in the Reservoir) and WR-3b (Increased Sediment Deposition that Obstructs Fish Passage) modify the description of the long-term impacts found in Impact WR-2 of the Draft EIR/EIS. For the Proponent's Proposed Project and Alternative 1, these impact issues consider the condition of sediment buildup in the reservoir with possible obstruction of the upstream fish ladder entrance. Impact Issue WR-3a considers the buildup of sediment in the remnant pool and WR-3b (Increased Sediment Deposition that Obstructs Fish Passage) considers the potential blockage at the fish ladder. For Alternatives 2 and 3, these impact issues consider sediment deposition upstream of the area where the Dam would be removed.

- In this Final EIR/EIS, Impact Issue WR-4a (Increased Sediment Deposition in the Lower River) modifies the description of long-term impacts discussed in the Draft EIR/EIS as WR-2 (Changes in Sediment Flux Passing the San Clement Dam Site) and WR-4 (Riverine Sediment Storage) based on additional sediment transport modeling. Impact issue WR-4b (Increase in Frequency of High Suspended Sediment Concentrations) in this Final EIR/EIS also modifies the description of long-term impacts discussed in the Draft EIR/EIS as WR-2 (Changes in Sediment Flux Passing the San Clement Dam Site) and WR-4 (Riverine Sediment Storage) and uses information from the additional sediment transport modeling to describe the suspended sediment concentration for each of the alternatives. These impacts are all downstream of the Dam or the dam site.

- In this Final EIR/EIS, impact issue WR-5 is the same as the Draft EIR/EIS Impact Issue WR-5 (Changes in Channel Bed Geometry). Impact Issue WR-6 (Changes to the 100-year Flood Elevation) in this Final EIR/EIS is similar to the Draft EIR/EIS impact issue WR-6 (Changes to the 100-year Floodplain). Some changes have been made to the impact determinations for these impacts based on the results of the additional modeling. For the Proponent's Proposed Project, it was determined that the impact was less than significant because the increase in elevations were less than one foot and mitigation would not be required. For Alternatives 1 and 3, there were changes that showed that elevation increases would be greater than 1 foot, but the changes in channel bed elevation and the 100-year flood elevations would be localized and not extensive and therefore would not have a significant impact. For Alternative 2, it was determined that the impacts would be significant and unavoidable because simulations show the change was greater than one foot for numerous cross sections.

- WR-7 (Impact to the Location or Timing of Water Supply Diversions) is the same as WR-7 (Water Supply) in the Draft EIR/EIS.

- Impact issue WR-8 (Increased Risk of Dam Failure) is the same as WR-8 (Dam Failure) in the Draft EIR/EIS.

- Additional appendices for this section have been created to address the comments Received on The Draft EIR/EIS. The appendices Include Appendix J, Sediment Operation And Management Plan For Fish Passage; Appendix M, Sediment Transport Modeling, Appendix O, Suspended Sediment Concentration Associated with A Sluice Event; Appendix P, Suspended Sediment Concentration Exceedance for the Alternatives, and Appendix S, MEI Studies on Sediment Suicing.[5]

Sediment Transport Modeling Summary Results

The results of the sediment transport are described below for each alternative. This section summarizes and compares the sediment Impact Issues (WR-3a, WR-4a, and WR-4b) for each alternative. This comparative information has been added in response to comments received on the Draft EIR/EIS.

The sediment transport analysis focuses on three evaluation criteria: reservoir sedimentation (WR-3a and 3b), sediment loading (WR-4a), and downstream sediment concentration (WR-4b). These criteria are described in Appendix M. The modeling results for each of these criteria are discussed for the 41-year simulation period (in the case of sluicing, the results are discussed for the one-year simulation [i.e., only a single year was simulated], as described in Appendix M).

Table 4.2-3 compares total sediment load under both wet- and dry-year hydrology for all project alternatives. In general, the most sediment would be stored under the baseline condition, which also reflects conditions for the Proponent's Proposed Project and Alternative 4. The least amount of sediment would be stored in the reservoir area under Alternative 2, which would dispose of all excavated sediment offsite (see Appendix M for a discussion of the sediment volume that cannot be removed by excavation).

[5] Note: Appendix I of the Draft EIR/EIS is now included in Appendix S of this Final EIR/EIS

Table 4.2-3: Total Simulated Sediment Load (AF) for all Alternatives

	Baseline, Proponent's Proposed Project, and Alternative 4		Alternative 1		Alternative 2		Alternative 3	
Sediment Load	**Wet**	**Dry**	**Wet**	**Dry**	**Wet**	**Dry**	**Wet**	**Dry**
Trapped In Reservoir	168	177	89	100	4	3	97	117
Passing SCD	506	496	585	573	669	670	576	556
Stored in Lower Carmel River	57	51	58	60	170	123	73	57

Source: MEI 2007
Note: Wet and Dry refer to the full 41-year hydrology that has been organized to start with a wet-year or a dry-year

For 86 years, the lower river has seen a reduced sediment supply because the Dam has trapped the sediment. The efficiency of the trapping has reduced over time and would approach 22 percent in about 40 years. The Proponent's Proposed Project and Alternative 1 would introduce additional sediment downstream through sluicing. Alternative 2 would remove the Dam and therefore, the annual natural sediment load in the river upstream of the Dam would flow downstream, but not all accumulated sediment could be removed from the system. Sediment from the canyon walls of the former reservoir that could not be excavated would also flow downstream and canyon walls could erode until they are stabilized with vegetation. This would add additional sediment to the natural background load. Alternative 3 would allow most annual natural sediment load to pass downstream, but sediment would continue to deposit upstream of the Carmel River bypass channel. Accumulated sediment downstream of the bypass would be stabilized in place in the Carmel River arm and not be available for transport.

Sediment modeling examined potential streambed adjustments, yielding projected changes in streambed elevation relative to the baseline condition. In general, changes in streambed elevation would be localized and would not occur consistently over an entire river reach. Alternative 2 would result in the most occurrences of increased streambed elevation of all the alternatives. This result does not mean flooding would occur, but does reflect an increased opportunity for floodwater to break out of the channel.

With the additional sediment moving downstream, suspended sediment concentrations would be highest under Alternative 2. Table 4.2-4 indicates the number of days that the concentration of suspended sediment exceeds 500 ppm, a threshold chosen to reflect potential impacts to fish (see discussion in Section 4.2.3 and 4.4.3).

The frequency of such exceedances would be highest for Alternative 2; the other alternatives are similar to one another. However, in all cases these results represent the number of days in a 41-year simulation and therefore represent a small percentage of the total simulation period. Appendix P plots the exceedance results shown in Table 4.2-1 by stream reach, comparing each project alternative with the modified baseline.

Table 4.2-4: Number of Days with Simulated Suspended Sediment Concentration Exceeds 500 ppm for all Alternatives

Wet-year Hydrology										
Concentration (ppm)	**Reach**									
	R4.3	R4.7	R5	R6.3	R6.7	R7.3	R7.7	R8.3	R8.7	R9
Baseline, Proponent's Proposed Project	22	21	24	28	30	32	33	30	33	31
Alternative 1	23	23	25	29	36	38	37	30	33	37
Alternative 2	49	42	40	39	45	47	41	35	38	40
Alternative 3	33	29	30	34	38	42	38	33	36	35
Dry-year Hydrology										
Concentration (ppm)	**Reach**									
	R4.3	R4.7	R5	R6.3	R6.7	R7.3	R7.7	R8.3	R8.7	R9
Baseline, Proponent's Proposed Project	27	23	28	30	38	42	40	35	36	33
Alternative 1	23	23	30	31	36	38	40	33	35	36
Alternative 2	41	35	40	38	41	43	44	38	41	39
Alternative 3	27	27	29	33	38	38	38	33	38	37

Note: Reach 4.3 is immediately below SCD. Reach 9 is at the lagoon. Simulation period is 41 years, starting with a wet-year or a dry-year.
Source: MEI 2007b

Proponent's Proposed Project

Issue WR-1: Changes in Streamflow during Construction

Changes in streamflow downstream of the Dam during construction drawdown, dewatering the plunge pool, or when inflow exceeds the bypass capacity
Determination: ***less than significant, no mitigation required, short-term***

IMPACT

For the Proponent's Proposed Project, the reservoir water surface elevation would be drawn down[6] approximately 15 feet, from an elevation of 525 feet to 510 feet to facilitate construction activities at the Dam. The drawdown would be accomplished by opening the upper and mid-level intake gates. The river would be diverted through a 50 cfs capacity bypass pipeline beginning upstream of the reservoir and discharging to the Carmel River at a point approximately 500 feet downstream of the Dam. Drawdown would begin once flows through the reservoir are at or below 50 cfs for three consecutive days. The date on which drawdown could begin would be constrained by biological requirements, seasonal rainfall, and river flows. It is expected that about six weeks would be required for installation of the diversion pipe and drawdown. Reservoir drawdown and dewatering is planned to be completed during CY 4.

To lower the water level in the reservoir, approximately 75 AF of stored water would be released though the Dam outflow gates at elevations 514 feet and 494 feet. Sediment would be removed to expose the mid level intake gate (494 feet) in order to continue to lower the water level. Water quality effects of this action are discussed in Section 4.3.3. Once the project is complete, the reservoir would be allowed to refill with runoff and the water surface would be maintained around the 525-foot elevation.

[6] This lowering of reservoir elevation for construction or, under other alternatives, demolition of the Dam, as described here and subsequently throughout this chapter, is not synonymous with the annual draw-down currently implemented as an interim safety measure, as ordered by DSOD and described in Chapters 1.6, 3.2.3 and 3.6.

During the construction drawdown, water released from SCD would include the natural inflow to the reservoir plus water released from storage. The Carmel River would experience slightly higher short-term outflows (as compared to inflows) during the construction period. The short-term impact would be to increase downstream flows by about 2 cfs during the 20-day drawdown period. This would have a less than significant beneficial impact to the Carmel River hydrology.

Water also would be removed from the plunge pool at the toe of the Dam prior to construction. Water from the plunge pool would be released downstream after the upstream diversion and reservoir drawdown is complete. Approximately 0.1 AF of water is stored in the plunge pool. The amount of water stored within the pool would be small and would have a less than significant impact to the Carmel River hydrology.

MITIGATION

The volume of water released from the reservoir for construction drawdown would not appreciably increase the downstream flow. No mitigation would be required.

Issue WR-2a: Changes in Sediment Flow Passing SCD Immediately after Construction

Changes in the amount of sediment transported from the upper watershed (above SCD) to the lower Carmel River (below SCD) immediately after construction
Determination: ***less than significant, no mitigation required, short-term***

IMPACT

In the Draft EIR/EIS, Impact Issue WR-2 covered both construction and operational impacts. In this Final EIS/EIS, Impact Issues WR-2a and WR-2b are confined to discussion of construction impacts. Operational impacts are covered in Issues WR-3a, WR-3b, WR-4a, and WR-4b.

Construction of the Proponent's Proposed Project would involve excavation of sediment from upstream of SCD to allow access to the Dam. The sediment removal during construction under the Proponent's Proposed Project would be minimal compared to the sediment removal required for Alternatives 1, 2, and 3. However, the sediment removal under the Proponent's Proposed Project would increase the available storage area upstream of the Dam and would trap additional sediment immediately after construction. This would reduce the sediment load passing SCD to the lower river by increasing the trap efficiency.

MITIGATION

In the Draft EIR/EIS, Impact Issue WR-2 was less than significant with mitigation. However, the mitigation identified was for operational changes covered in WR-3a, WR-3b, WR-4a, and WR-4b of this Final EIR/EIS.

After completion of construction, the area where sediment has been excavated would fill in through natural sediment transport, leaving only a remnant pool. Based on the sediment transport modeling, the remnant pool would be about 5 to 10 AF in size and would result in a trap efficiency of about 22 percent. This is similar to the baseline and no mitigation is required.

Issue WR-2b: Changes in Sediment Storage and Composition in the Lower River during Construction

Changes in the sediment composition of the Carmel River below SCD
Determination: ***less than significant with mitigation, short-term***

IMPACT

In the Draft EIR/EIS, Impact Issue WR-2 covered both construction and operational impacts. In this Final EIS/EIS, WR-2a and WR-2b covers construction impacts that were included in Impact Issues WR-3 and WR-4 of the Draft EIR/EIS. Operational impacts are covered in Issues WR-3a, WR-3b, WR-4a, and WR-4b.

During construction of the Proponent's Proposed Project, additional sediment may be released downstream from the construction activities, largely because of vegetation removal exposing bare soil during construction. Because the construction activity would occur in the low-flow period when sediment transport is low, construction-period sediment releases would be primarily fine sand rather than gravel. Sediment releases may continue after construction until vegetation is re-established on bare surfaces exposed by construction activities.

Immediately after construction, if the trap efficiency has increased because of construction (see issue WR-2a), the composition of the sediment passing the Dam would change and the amount of coarse sands and gravels would decrease as compared to baseline.

MITIGATION

In the Draft EIR/EIS, Impact Issue WR-3 was short-term, significant, and unavoidable; long-term, less than significant with mitigation, and potentially beneficial. However, the impacts and mitigation identified result from operational changes which are no longer part of this issue and are covered in WR-4a and WR-4b.

As described below in the mitigation discussion for water quality (Section 4.3), a diversion facility would be installed to hold turbid water until sediment has settled out sufficiently that the water can be released downstream. The effects of vegetation removal for construction would continue to affect sediment composition until vegetation is reestablished. Based upon visual accounts of regeneration at the site, vegetation would be established within one to two years following construction. With the mitigation measures discussed, this impact would be less than significant.

Issue WR-3a: Change in Sediment Deposition in the Reservoir

Changes in the amount of sediment deposited in the reservoir upstream of SCD
Determination: ***less than significant with mitigation; potentially beneficial, long-term***

IMPACT

In this Final EIR/EIS, Impact Issues, WR-3a, WR-3b, WR-4a, and WR-4b cover sediment management operations after construction, including sluicing activities that were discussed in WR-2, WR-3, and WR-4 in the Draft EIR/EIS.

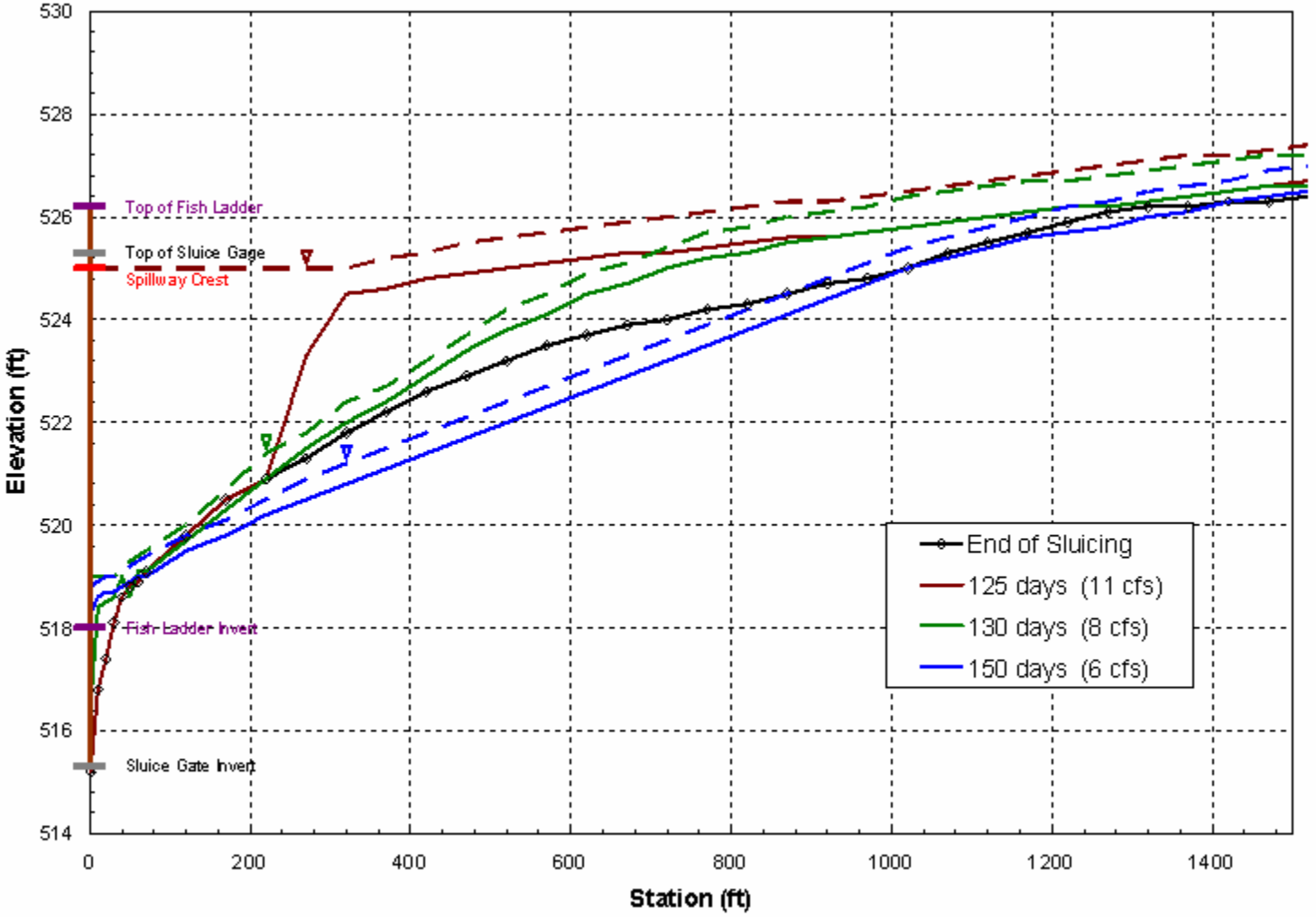
The trap efficiency of the reservoir would decrease over time from the current level of 75 percent to about 22 percent. The efficiency would decrease further with sediment management activities detailed in the SOMP (Appendix J). Sluicing under the Proponent's Proposed Project would decrease the trap efficiency of the reservoir to a range of 15 to 17 percent. As the trap efficiency declines, additional sediment would be available downstream relative to the amount that was present under baseline conditions.

Sediment sluicing simulations suggest that sediment management in the remnant pool can be improved by controlling the water surface elevation and directing the water and sediment flow over the spillway. To direct the water over the spillway, the water surface elevation must be maintained at the spillway elevation. Simulations were conducted assuming the fish ladder opening was reduced so that a maximum of 10 cfs would pass. This flow would be sufficient to allow fish passage and would force additional flow above 10 cfs over the spillway. Figure 4.2-10 shows the results of the single-year dry-year simulation with the fish ladder operating at 10 cfs.

Under this dry-year condition, the flow would go over the spillway for up to 125 days after the sluice event (June 14) and the sediment wedge[7] would be about 300 feet from the spillway. After the flow drops to less than 10 cfs, the flow would go through the fish ladder and the sediment would be carried downstream.

[7] The term "wedge" is used here and throughout this chapter to refer to the accumulated sediment behind the Dam. It does not refer to a slug of sediment released downstream.

Figure 4.2-10: Simulated Channel Invert Upstream of Dam up to 150 Days after the Sluice Event for a Dry-year with the Fish Ladder Operating at 10 cfs



Source: MEI 2007b.
Note: Dashed line represents the water surface elevation corresponding to the channel invert of the same color. The sluice was simulated to occur on February 9, 1985.

The division of sediment between the spillway and the fish ladder is shown in Figure 4.2-11, Figure 4.2-12 and Figure 4.2-13. Sediment is simulated to move over the spillway and through the fish ladder. Sediment flow through the fish ladder is related to low-flow conditions and would occur in a wet-year after June. In a dry-year, flows would drop below the ladder capacity and all the flow would go through the ladder as early as March. This dry-year condition can be addressed by reducing the ladder flow and maintaining spillway control over the water surface elevation in the remnant pool.

Modeling also indicated that the initial bed profile from the two-hour sluice would not optimize sediment removal from the remnant pool. The simulated bed profile after 150 days would be lower than the profile at the end of the sluice. This reflects additional sediment moving through the fish ladder that could have moved through the sluice gate if a longer sluicing event were implemented.

As a result of comments received, the SOMP was revised to include tools other than sluicing to manage sediment in the remnant pool for fish passage (see the SOMP, Appendix J). In each case, sediment management would occur during the low-flow period of August through October. Sediment may be mechanically dredged or suction dredged from the remnant pool. This material would be dried and hauled or stockpiled for future flood flows to mobilize and convey over the Dam.

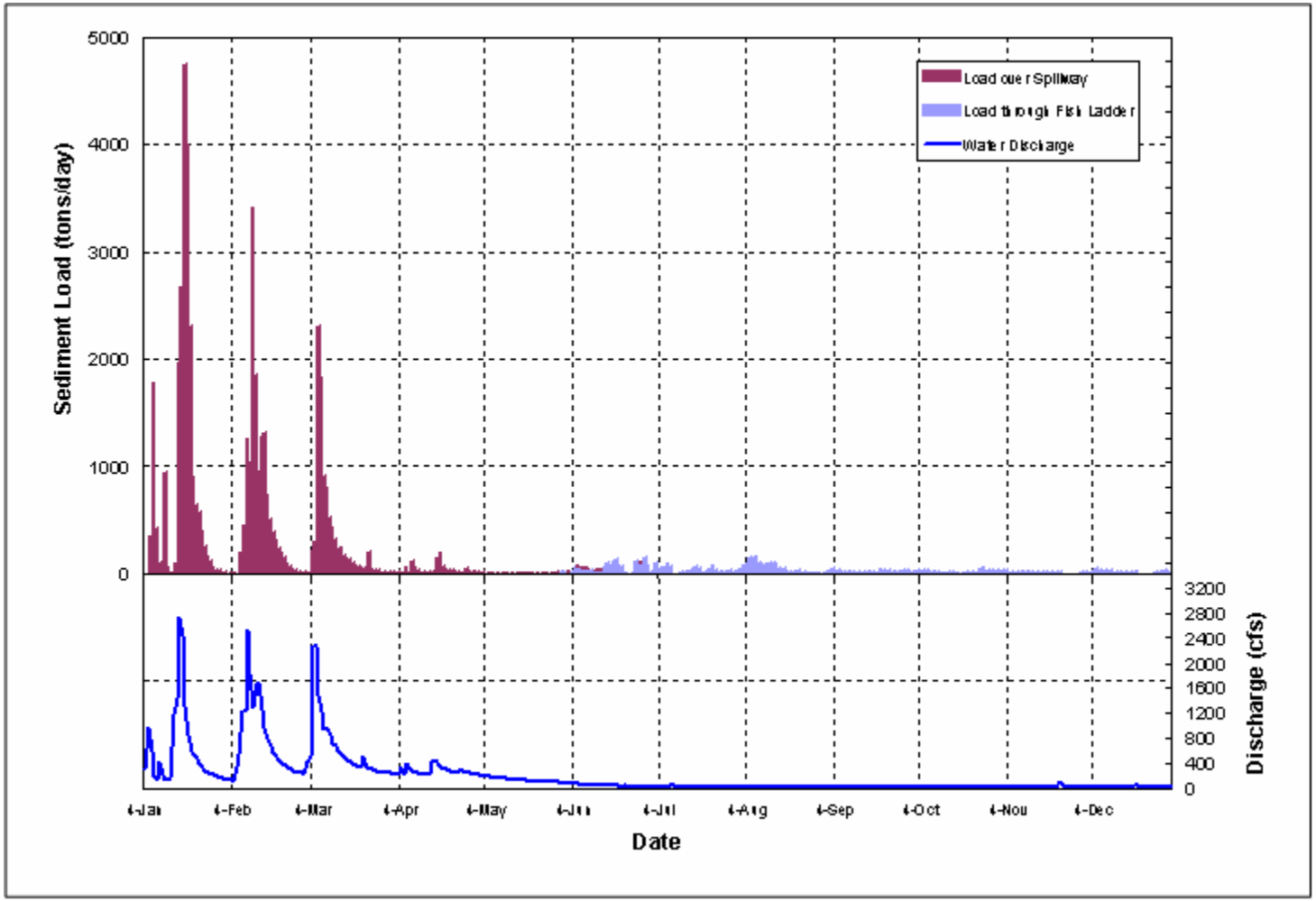
Drying the sediment would be accomplished by placing the wet material in a bermed area within the existing reservoir area, higher than the active flow channel. This material would be screened for different sediment size classes and would be available for injection into the river downstream.

Gravel injection is used below dams on several California rivers as a means of replenishing certain gravel sizes that are absent from the natural sediment flow.

MITIGATION

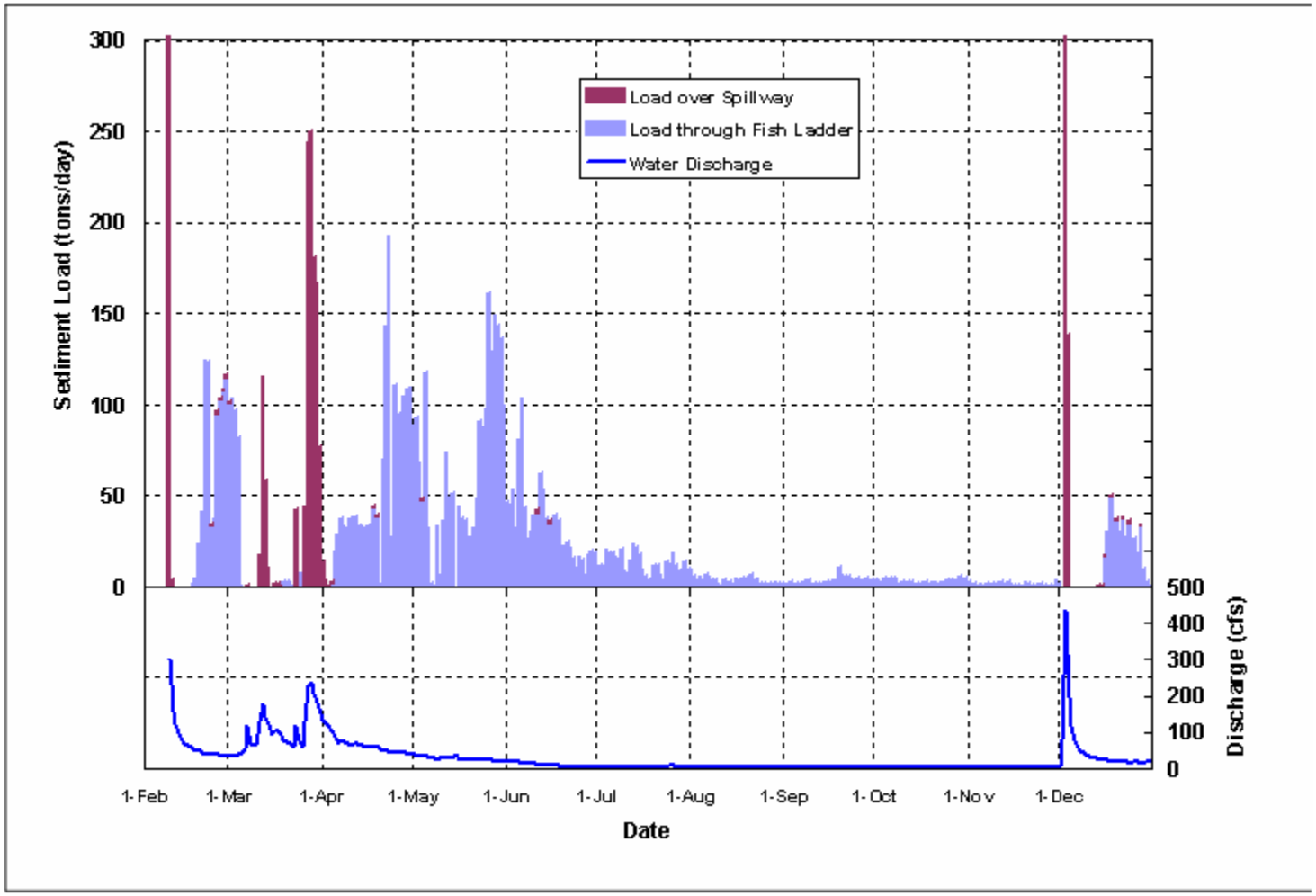
Implementation of the SOMP would improve the sediment conditions for fish passage upstream of the reservoir and would help move sediment through the reservoir. Utilizing the SOMP processes would minimize impacts from sediment deposition in the reservoir to less than significant.

Figure 4.2-11: Sediment Load Passing San Clemente Dam through the Spillway and Fish Ladder for a Wet-year



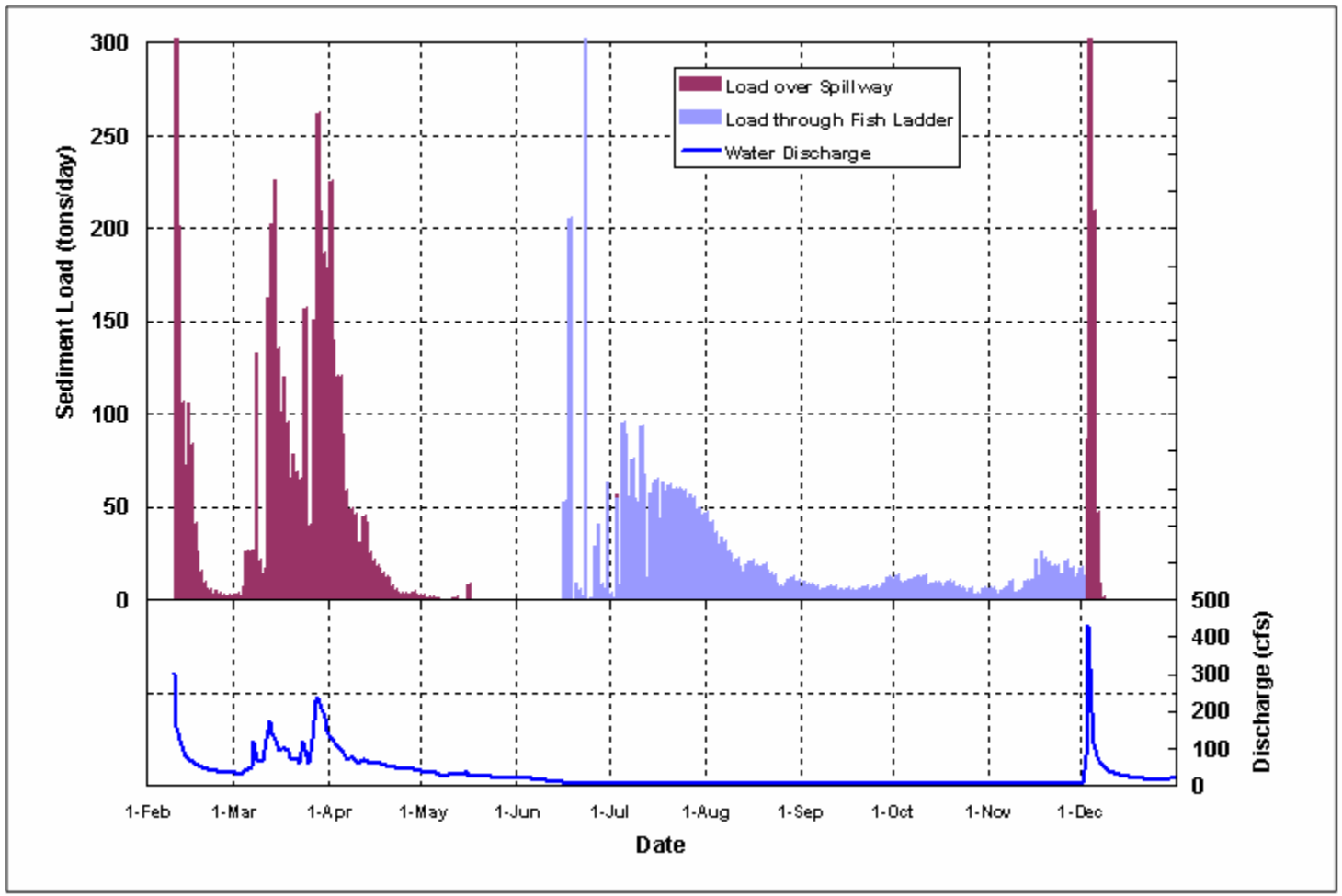
Source: MEI 2007b

Figure 4.2-12: Sediment Load Passing San Clemente Dam through the Spillway and Fish Ladder for a Dry-year



Source: MEI 2007b

Figure 4.2-13: Sediment Load Passing San Clemente Dam through the Spillway and Fish Ladder for a Dry-year when the Fish Ladder Capacity is 10 cfs



Source: MEI 2007b

Issue WR-3b: Increased Sediment Deposition that Obstructs Fish Passage

During low-flow years, when all the flow is through the fish ladder, sediment would move close to the fish ladder, and possibly impair fish passage from the ladder to the remnant pool
Determination: ***less than significant with mitigation, long-term***

IMPACT

In this Final EIR/EIS, Impact Issues WR-3a, WR-3b, WR-4a, and WR-4b cover sediment management operations after construction including sluicing activities previously described in impact issues WR-2, WR-3, and WR-4 of the Draft EIR/EIS.

During low-flow periods, when all of the river flow is going through the fish ladder, the slope of the water surface of the channel leading into the remnant pool is steep and has a high sediment transport capacity. This sediment can build up in a wedge in the remnant pool that would approach the fish ladder exit. Fine sediment would be conveyed toward and through the fish ladder. This is not strictly an effect of the project, as it occurs under existing conditions.

This impact would be reduced by decreasing the capacity of the ladder and forcing more water over the spillway. When water is flowing over the spillway, the water surface elevation of the remnant pool would be controlled by the spillway elevation rather than the fish ladder elevation. This would decrease sediment transport into the pool and cause any sand to deposit at the upstream end of the pool. Implementation of the SOMP (Appendix J) would remove sediment that would otherwise deposit upstream of the fish ladder.

MITIGATION

Implementation of the SOMP would improve the sediment conditions upstream of the reservoir and help move sediment through the reservoir, which would improve fish passage. Utilizing the SOMP processes would minimize impacts from sediment deposition in the reservoir to less than significant.

Issue WR-4a: Increased Sediment Deposition in the Lower River

The increased sediment load passing SCD depositing in the Carmel River bed below SCD
Determination: ***less than significant, no mitigation required, potentially beneficial, long-term***

IMPACT

In this Final EIR/EIS, Impact Issues, WR-3a, WR-3b, WR-4a, and WR-4b cover sediment management operations after construction, including sluicing activities that were discussed in WR-2, WR-3, and WR-4 in the Draft EIR/EIS.

The historic transport of sediment load down the Carmel River was interrupted by the construction of SCD (this is not an impact of the project, but a baseline condition). However, implementation of this alternative passes additional sediment over the Dam to the lower river. Sediment transport simulations indicate that under the Proponent's Proposed Project about 506 AF would pass SCD for the 41-year simulation and of this amount, about 57 AF would be stored in the lower river. Although this sediment load would be less than the total sediment load upstream of the Dam, it would improve baseline conditions and would reestablish some of the sediment continuity in the river.

During the sluicing event, additional sediment would be released downstream. The total sediment load delivered to the lower river following a sluicing event is shown in Figure 4.2-14. The figure shows that sediment supply to the reservoir in a wet-year would be about 35 AF. About 28 AF passes SCD for the modified baseline (no sluicing) and about 32 AF passes SCD under the Proponent's Proposed Project with sluicing. About 4 AF of sediment would be delivered to the river by sluicing.

For a dry-year, about 2.4 AF of sediment is delivered to the reservoir from upstream, about 3.8 AF would pass the Dam for the modified baseline (no sluicing), and 8.8 AF of sediment would move downstream past the Dam under the Proponent's Proposed Project with sluicing and with the fish ladder operating at full capacity or at 10 cfs capacity (Figure 4.2-15).

The gradation of the sediment passing the Dam after a sluicing event as simulated in the model is shown in Figure 4.2-16. Under the Proponent's Proposed Project, most of the sediment passing the Dam would be very fine sand to very coarse sand. However, some sediment in sizes up to fine gravel also would pass the Dam (Figure 4.2-16). This load represents a larger sediment load than under the modified baseline (no sluicing) and represents a potential improvement to the lower river. In a wet-year, the sediment load passing SCD is simulated to be less than the supply, whereas in a dry-year, the load is greater than the supply.

MITIGATION

In the Draft EIR/EIS, the SOMP was included as a mitigation measure for this issue, which was characterized as short-term, significant, and unavoidable; long-term, less than significant with mitigation, and potentially beneficial. However, additional sediment transport modeling studies discussed previously in this section show that, although a small increase in sediment transport would occur with sluicing under the Proponent's Proposed Project, this impact would be less than significant and no mitigation would be required.

Figure 4.2-14: Simulated Cumulative Sediment Volume Passing San Clemente Dam for Wet-year Hydrology

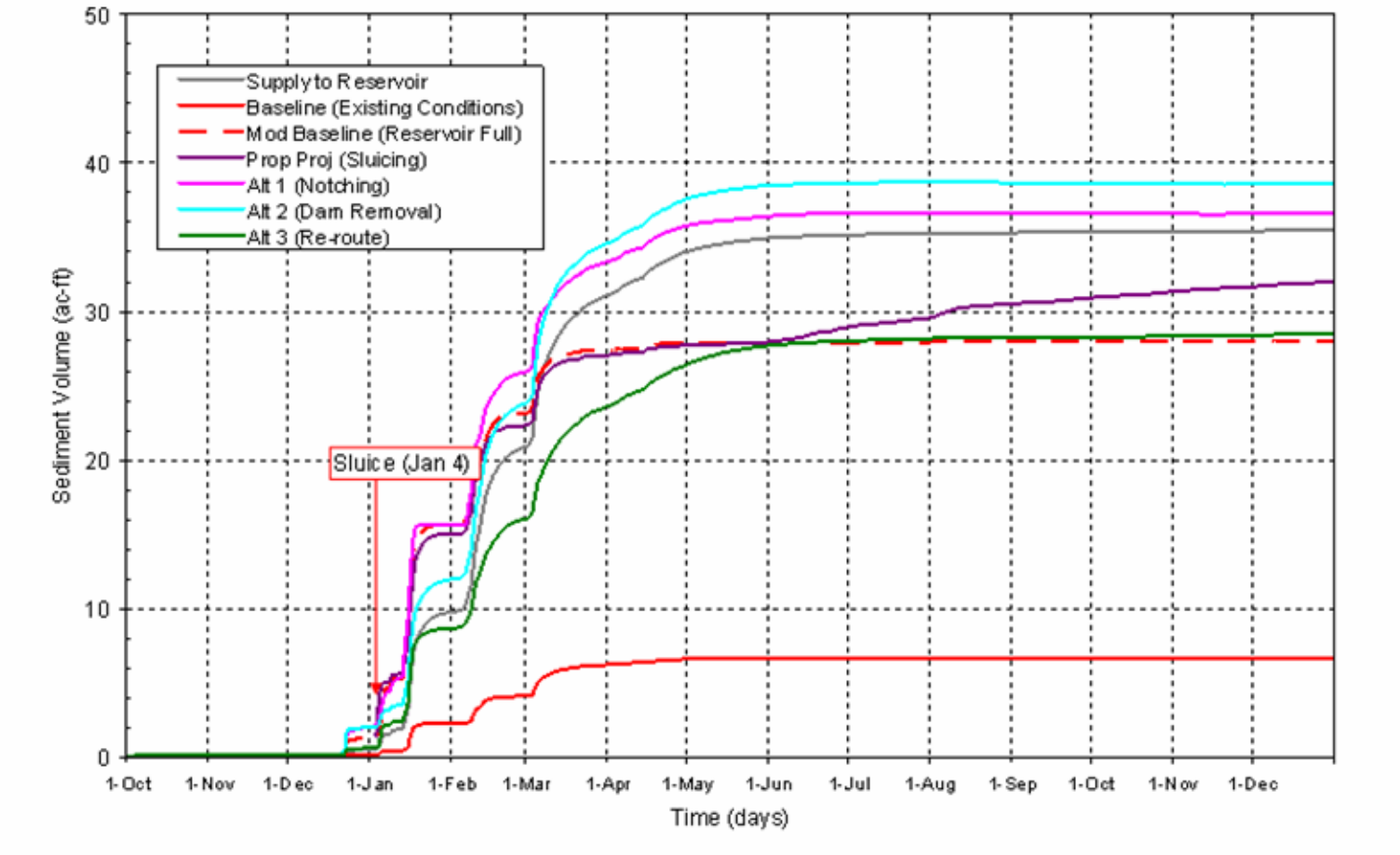


Figure 4.2-15: Simulated Cumulative Sediment Volume Passing San Clemente Dam for Dry-year Hydrology

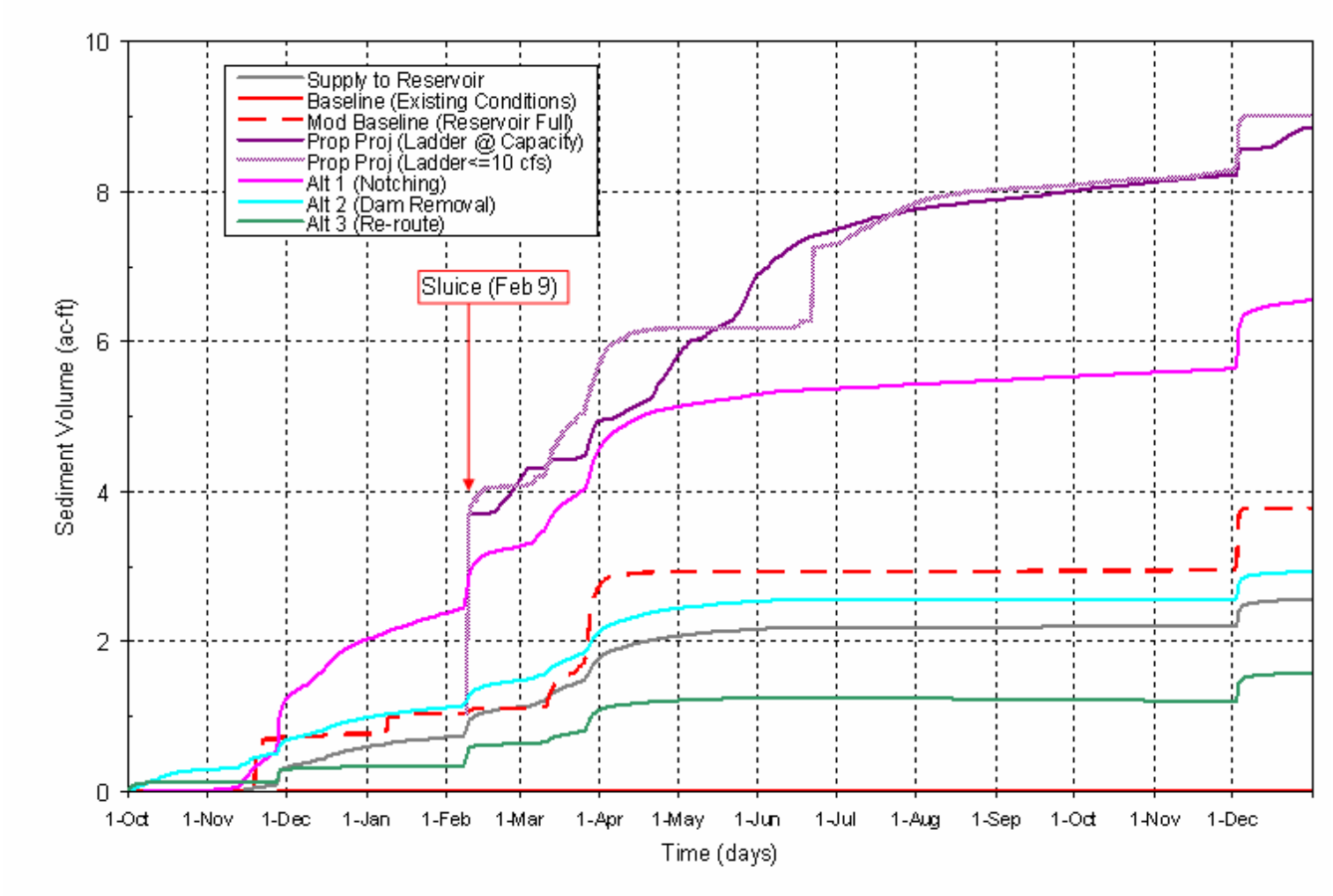
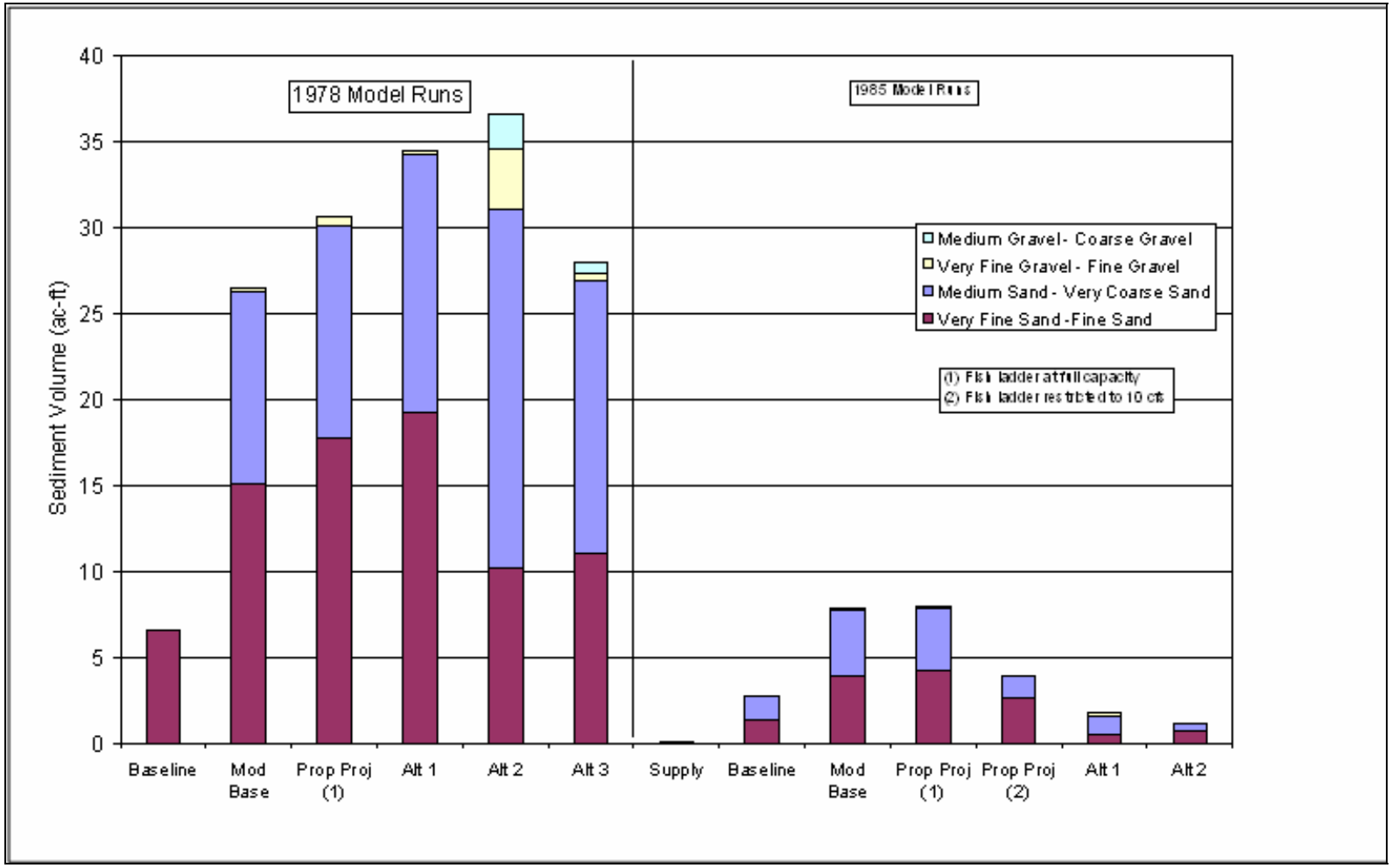


Figure 4.2-16: Simulated Sediment Gradation Passing SCD following a Sluicing Event



Source: MEI 2007b

Issue WR-4b: Increase in Frequency of High Suspended Sediment Concentrations

High flows will increase the sediment concentration in the river and sediment management activities, such as sluicing, would further increase the suspended sediment concentration downstream of the Dam
Determination: ***less than significant, no mitigation required, long-term***

IMPACT

In this Final EIR/EIS, Impact Issues, WR-3a, WR-3b, WR-4a, and WR-4b cover sediment management operations after construction, including sluicing activities that were discussed in WR-2, WR-3, and WR-4 in the Draft EIR/EIS.

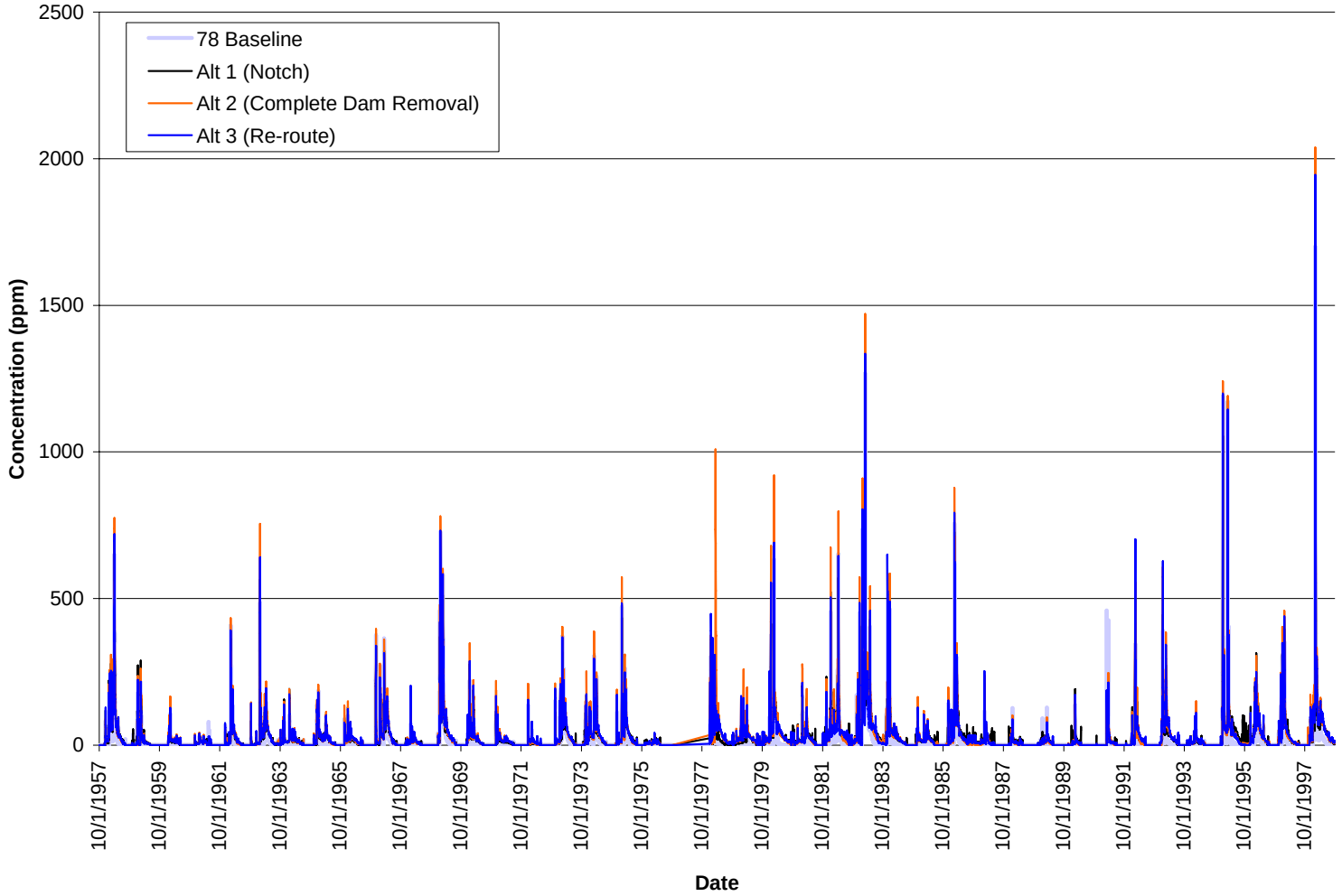
Suspended sediment concentration responds to the hydrology of the river. High flows increase the suspended sediment concentration. This increase is related to the flow and not the project alternatives. During high flows, the transport capacity increases and the size of the sediment that is moved by the flow increases. Sediment management activities, such as sluicing would cause a short-term increase in suspended sediment concentration in the lower river.

Simulations of the sluicing event for both a wet and dry-year indicate that the suspended sediment concentration increases with the sluice, but that the increase is short-lived in both time and distance downstream of the Dam (Appendix O).

The downstream suspended sediment concentration was simulated for the alternatives under the 41-year hydrologic record using the sediment loading from the modeling. The long-term sediment concentration at reaches 4.3, 6.0, and 9.0 is shown in Figure 4.2-17, Figure 4.2-18 and Figure 4.2-19. These three reaches represent the Carmel River upstream near SCD, midway along the river, and downstream near the mouth. The simulation of the Proponent's Proposed Project is similar to the baseline condition without sediment management.

The daily suspended sediment concentration results were evaluated for the 41-year simulation based on ranges of concentration for each river reach (Table 4.2-5). The table presents the number of days that the suspended sediment concentration exceeds 500 parts per million (ppm). This concentration is used in this analysis as a threshold for potential adverse impacts to fish.

Figure 4.2-17: Simulated Suspended Sediment Concentration at Reach 4.3 for the 41-Year Simulation, Wet-Year Hydrology



Source: MEI 2007b

Figure 4.2-18: Simulated Suspended Sediment Concentration at Reach 6.0 for the 41-year Simulation, Wet-Year Hydrology

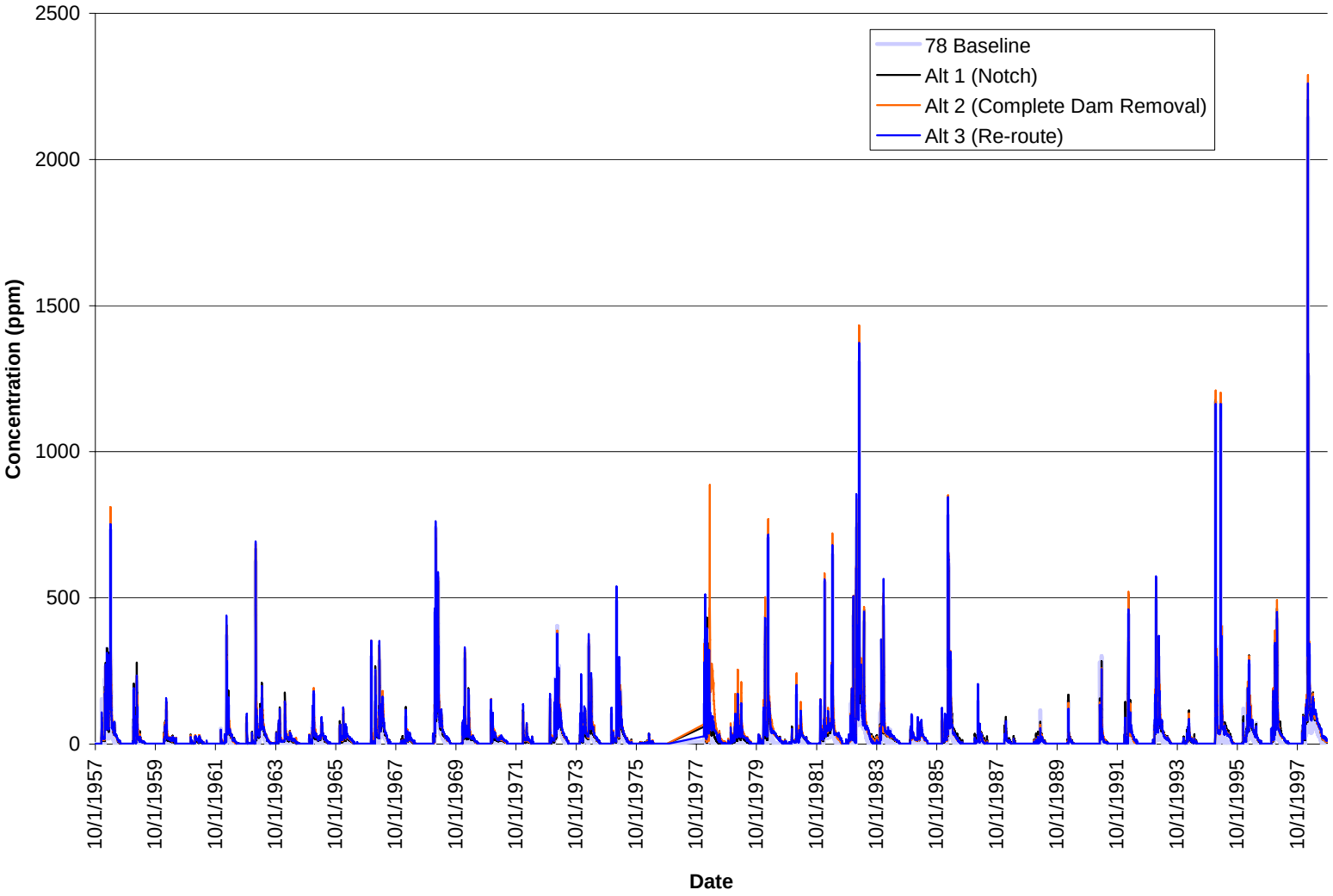


Figure 4.2-19: Simulated Suspended Sediment Concentration at Reach 9.0 for the 41-year Simulation, Wet-Year Hydrology

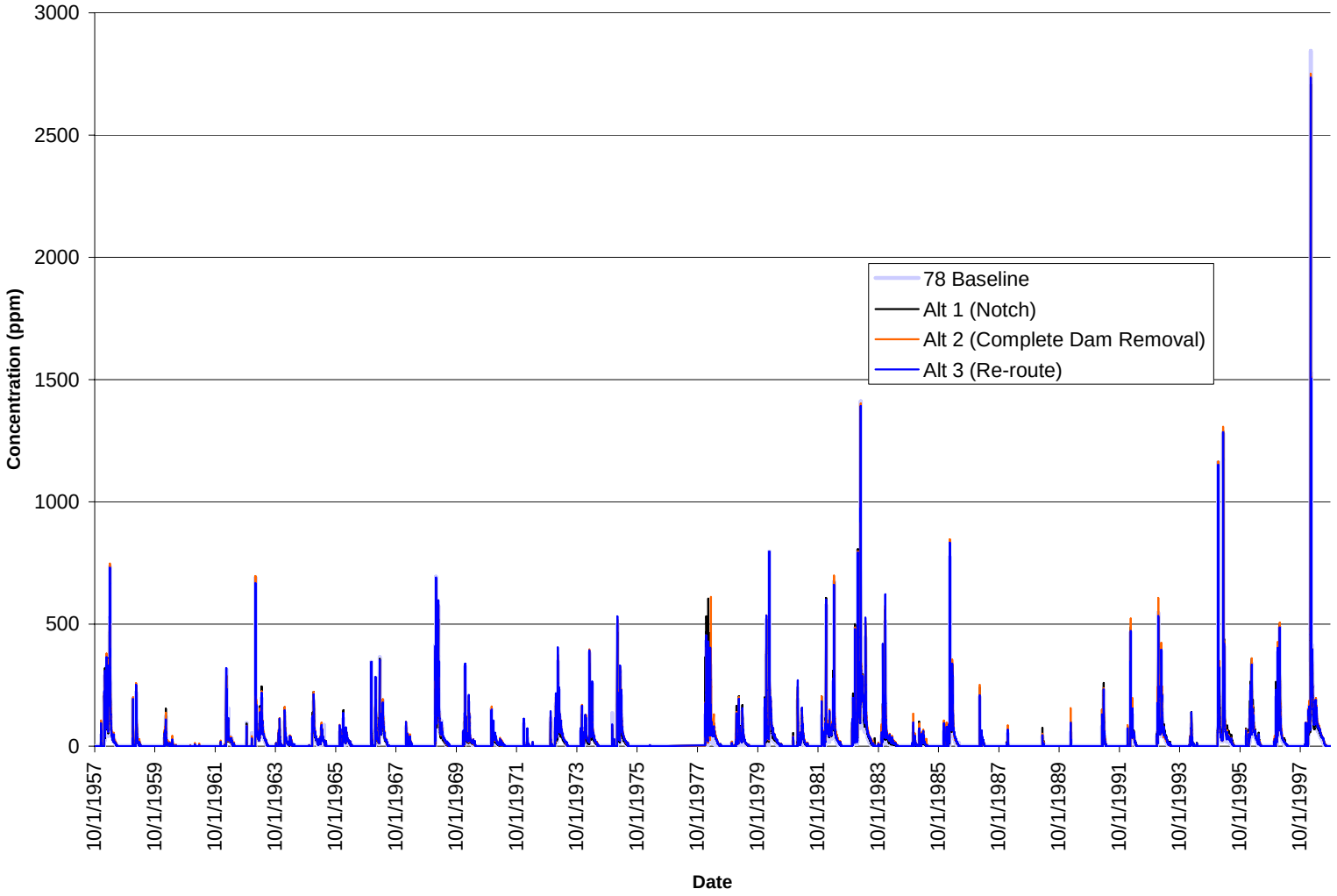


Table 4.2-5: Number of Days with Simulated Suspended Sediment Concentration within Defined Limits for the Proponent's Proposed Project

Wet-Year Hydrology										
Concentration	**Reach**									
(ppm)	**R4.3**	**R4.7**	**R5**	**R6.3**	**R6.7**	**R7.3**	**R7.7**	**R8.3**	**R8.7**	**R9**
Less than 200	14,643	14,640	14,618	14,619	14,620	14,601	14,594	14,613	14,570	14,569
200-400	108	116	133	124	118	136	141	126	166	170
400-500	19	15	17	21	24	23	24	23	23	22
500-600	5	5	6	8	8	8	9	9	11	9
600-800	9	9	10	11	13	15	11	12	11	11
800-1000	4	3	2	3	2	2	6	2	3	4
1000-1200	2	2	3	3	1	1	1	2	4	3
1200-1400	1	1	2	2	3	4	4	3	1	1
1400-1600	0	0	0	0	2	1	1	1	2	2
1600-1800	1	1	0	0	0	0	0	0	0	0
1800-2000	0	0	0	0	0	0	0	0	0	0
>2000	0	0	1	1	1	1	1	1	1	1
Greater than 500	22	21	24	28	30	32	33	30	33	31
Dry-Year Hydrology										
Concentration	**Reach**									
(mg/L)	**R4.3**	**R4.7**	**R5**	**R6.3**	**R6.7**	**R7.3**	**R7.7**	**R8.3**	**R8.7**	**R9**
Less than 200	14,628	14,626	14,607	14,611	14,600	14,581	14,571	14,585	14,562	14,556
200-400	119	121	136	131	134	149	156	153	175	183
400-500	18	22	21	20	20	20	25	19	19	20
500-600	10	7	10	12	15	15	13	12	11	9
600-800	9	8	8	8	11	15	15	12	14	13
800-1000	4	3	4	3	4	4	4	3	3	3
1000-1200	2	1	1	4	2	2	2	3	4	4
1200-1400	1	3	4	1	3	3	3	2	1	1
1400-1600	0	0	0	1	2	2	2	2	2	2
1600-1800	1	1	0	0	0	0	0	0	0	0
1800-2000	0	0	0	0	0	0	0	0	0	0
>2000	0	0	1	1	1	1	1	1	1	1
Greater than 500	27	23	28	30	38	42	40	35	36	33

Note: Reach 4.3 is immediately below SCD. Reach 9 is at the lagoon. Simulation period is 41 years.

The majority of the simulated values are less than 200 ppm for the 41-year record. However, the simulated suspended sediment concentration does exceed 500 milligrams per liter (mg/L) from 21 to 33 days for the wet-year hydrology. In the dry-year hydrology, 500 mg/L is exceeded from 23 to 42 days in the lower river.

The influence of a sluice event on suspended sediment concentration in the river from SCD to the ocean was evaluated from the single-year modeling results. Sediment loading results from the one-year sluicing simulation were used to compute the suspended sediment load in the lower river.

Figures O-1 through O-10 in Appendix O show a suspended sediment concentration hydrograph for ten river reaches distributed from the Dam (station 4.3) to the lagoon (station 9) in a wet-year. These figures show that the sediment released during a sluicing event dissipates rapidly in the downstream direction so that the effects of the sluice are not observed far downstream. Similarly, describing a wet-year sluice event in

terms of the daily suspended sediment for the longitudinal distance downstream of the Dam also shows a pattern of dissipation (Appendix O, Figures O-11 through O-14). These figures show suspended sediment concentration in the river, downstream of SCD, for the day of the sluice and during the three following days. The highest simulated suspended sediment concentration would be found in reach 4.3 (subdivided into a, b, and c). The sediment concentration drops to background levels by reach 4.7.

Appendixes O, Figures O-15 through O-24 show the sediment concentration in the lower river after a dry-year sluice event. Appendix O Figures O-25 through O-28 show the concentration for a dry-year sluice along the lower Carmel River from day 1 to day 4 of the event. Generally, similar levels of sediment occur in the river as compared to the modified baseline downstream from Reach 5 (Hitchcock Canyon to Robles del Rio).

Appendix P plots exceedance against concentration for each river station for the one-year sluice simulation. The plots track exceedance up to the 50 percent exceedance level, (that is, up to the point at which 50 percent of the concentrations are greater than the threshold level, which is 500 ppm). The figures in Appendix P show that the suspended sediment concentration from sluicing would not persist either at one location over several days or in the downstream direction. In Reach 4.3, the Proponent's Proposed Project results in the highest suspended sediment concentration as compared to other project alternatives, when concentrations are about 300 ppm or less.

The exceedance plots show that for a wet year, sluicing increases sediment concentrations in Reach 4.3, but concentrations would decrease downstream. All of the alternatives arrive at roughly similar concentrations by Reach 7.3. For the dry-year, sluicing results in higher concentrations compared with the baseline from Reach 4.3 downstream to reach 6.7. From Reach 6.7 to the ocean, sluicing results in the same concentrations as the modified baseline.

Sluicing of sediment from upstream of the Dam would be conducted only if wet season sediment management is needed (see SOMP, Appendix J) and during periods of high flow in the river. If sluicing were needed, the concentration in the river downstream would be monitored as part of an adaptive management approach (see the SOMP, Appendix J). The results of the monitoring would be used to determine the duration and magnitude of sluicing events.

MITIGATION

In the Draft EIR/EIS, Impact issue WR-4b was short-term, significant, and unavoidable; long-term, less than significant with mitigation and potentially beneficial. The SOMP was also included as a mitigation measure for this impact. The additional suspended sediment concentration studies discussed above show that if sluicing is implemented during high-flow periods within the wet season, the impacts for this issue under the Proponent's Proposed Project would be less than significant and no additional mitigation would be required.

Issue WR-5: Changes in Channel Bed Geometry

Additional sediment passing the Dam to the lower river would aggrade or degrade the river channel or change the channel cross sections
Determination: ***less than significant, potentially beneficial no mitigation required, long-term***

IMPACT

The channel of the lower river has adjusted over time to the depleted sediment supply. Although this alternative would add additional sediment beyond the baseline levels, the increased load would not significantly add to the channel downstream. In addition, the increase in the sediment loading downstream would occur slowly, as seen in the sediment transport modeling results presented above. Although not intended to improve sediment supply, implementation of the SOMP would incidentally improve the sediment supply for the lower river by reducing the trap efficiency of the reservoir. This would also help the river slowly reestablish the sediment continuity. This impact would be less than significant.

MITIGATION

In the Draft EIR/EIS, Impact Issue WR-5 was less than significant with mitigation. As a result of additional sediment modeling, the impact under the Proponent's Proposed Project would be less than significant and no mitigation would be required.

Issue WR-6: Changes to the 100-year Flood Elevation

The increased sediment loading would alter the bed of the Carmel River and influence the 100-year flood elevation
Determination: less ***than significant, no mitigation required, long-term***

IMPACT

Changes in the downstream sediment loading would influence the bed elevation, which in turn, would alter flood elevations. It is not anticipated that this would significantly alter the 100-year flood elevation. As explained above, implementation of the SOMP under the Proponent's Proposed Project would incidentally gradually reduce the trap efficiency and add sediment to the river. This would also allow the river to slowly adjust to the increasing sediment supply.

MITIGATION

In the Draft EIR/EIS, Impact Issue WR-6 was less than significant with mitigation. As a result of additional sediment modeling, the impacts under the Proponent's Proposed Project would be less than significant and no mitigation would be required.

Issue WR-7: Impact to the Location or Timing of Water Supply Diversions

Changes to the location or timing of water supply diversions

Impacts and mitigation measures for Issue WR-7 would not occur under the Proponent's Proposed Project. SCD provides an existing point of diversion for CAW on the Carmel River, which would be maintained and unaltered.

Issue WR-8: Increased Risk of Dam Failure

Risk of dam failure due to seismic activity or flooding, leading to or increasing downstream flooding
Determination: ***less than significant, no mitigation required, long-term***

IMPACT

Please refer to Section 4.1 Geology and Impact Issue GS-1 for a discussion of seismic risks. Under the Proponent's Proposed Project, dam thickening would eliminate the potential for dam failure during the MCE and PMF.

MITIGATION

In the Draft EIR/EIS, discussion for this impact incorrectly identified the Proponent's Proposed Project as mitigation for this impact. However, no mitigation would be required for this impact, as the San Clemente Dam Seismic Safety Project specifications are designed to withstand a MCE, as well as peak ground accelerations, a condition that cannot be met by the existing dam. The project would satisfy the EIR/EIS purpose and need of eliminating the potential for dam failure that may occur during a MCE and/or PMF.

Alternative 1 (Dam Notching)

WR-1: Changes in Streamflow during Construction

Changes in streamflow downstream of the Dam during construction drawdown, dewatering the plunge pool, or when inflow exceeds the bypass capacity
Determination: ***less than significant, no mitigation required, short-term***

IMPACT

The impact potential would be the same as discussed for the Proponent's Proposed Project, Impact Issue WR-1. Due to limited storage capacity, releases from the Dam would not significantly increase river flows. Additional releases to the downstream reaches of the Carmel River would occur only during drawdown and would be less than significant during CY 4, 5, and 6.

During the winter and spring, runoff from upstream would temporarily fill the excavated reservoir with water. The drawdown during CY 4, 5, and 6 would be approximately 500 AF. To drawdown the reservoir over the same 20-day period as described in the Proponent's Proposed Project, Impact Issue WR-1, the increase in discharge would be approximately 13 cfs. This increase is within the range of variability observed during this time period at the Robles del Rio stream gage under baseline conditions, therefore this impact would be less than significant.

MITIGATION

No mitigation required (see discussion for the Proponent's Proposed Project under Impact Issue WR-1).

WR-2a: Changes in Sediment Flow Passing SCD Immediately after Construction

Changes in the amount of sediment transported from the upper watershed (above SCD) to the lower Carmel River (below SCD) immediately after construction
Determination: ***less than significant, no mitigation required, short-term***

IMPACT

In the Draft EIR/EIS, Impact Issue WR-2 covered both construction and operational impacts. In this Final EIS/EIS, discussion of Impact Issues WR-2a and WR-2b are limited to construction. Operational impacts are discussed in Issues WR-3a, WR-3b, WR-4a, and WR-4b.

Similar to the Proponent's Proposed Project, Alternative 1 would involve excavation of sediment from upstream of SCD to allow access to the Dam for construction activities. The amount of excavation would be greater for this alternative because of the excavation needed for the notching. This would increase the available storage area upstream of the Dam and would trap additional sediment in the years immediately after construction. This would influence the sediment load passing SCD to the lower river by increasing the trap efficiency resulting in less sediment transport downstream.

No mitigation would be required (see discussion for the Proponent's Proposed Project under Impact Issue WR-2a).

WR-2b: Changes in Sediment Storage and Composition in the Lower River during Construction

Changes in the sediment composition of the Carmel River below SCD
Determination: ***less than significant with mitigation, short-term***

IMPACT

This impact is similar to Impact Issue WR-2b described above for the Proponent's Proposed Project.

MITIGATION

No mitigation required (see discussion for the Proponent's Proposed Project under Impact Issue WR-2b).

WR-3a: Change in Sediment Deposition in the Reservoir

Changes in the amount of sediment deposited in the reservoir upstream of SCD
Determination: ***less than significant with mitigation and potentially beneficial, long-term***

IMPACT

In this Final EIR/EIS, Impact Issues WR-3a, WR-3b, WR-4a, and WR-4b cover sediment management operations after construction, including sluicing activities that were discussed in WR-2, WR-3, and WR-4 in the Draft EIR/EIS.

The trap efficiency of the reservoir would decrease over time from the current level of 75 percent to about 10 percent. The efficiency would decrease further with sediment management activities detailed in the SOMP (Appendix J). As the trap efficiency declines, additional sediment would be available downstream relative to the amount that was present under baseline conditions.

Under this alternative, the reservoir would be drawn down an additional 15 feet to elevation 495 to accommodate construction and dam notching would lower the spillway elevation to 506. An estimated 930 AF of sediment would be removed from behind the Dam to allow the reservoir to be drawn down to the level required for notching. This would lower the sediment elevation by about 19 feet and expose the upstream portion of the natural channel of both Carmel River and San Clemente Creek. The procedure for reservoir drawdown would be the same as described for the Proponent's Proposed Project except it would occur over three construction seasons.

Following dam notching and sediment excavation, a geomorphically stable channel would be constructed in the natural channel exposed by excavation and through the remaining stored sediment in the reservoir in both Carmel River and San Clemente Creek upstream to the point at which it intersects both channels. MEI developed reconstructed channels for use in modeling simulations (MEI 2007b) (Figure 4.2-20 and Figure 4.2-21).

Notching the Dam at elevation 506 would remove all currently remaining water storage capacity in the reservoir. The long-term trapping efficiency would decline to 9 percent and 11 percent for the dry-year and wet-year hydrology, respectively.

The sediment transport simulations suggest that about 89 AF and 100 AF of sediment would be stored in the reservoir under this alternative for the wet-year and dry-year hydrology, respectively (Figure 4.2-22 and Figure 4.2-23).

The SOMP would also be implemented under this alternative and sluicing would be used in the same way described for the Proponent's Proposed Project. A separate simulation was not performed because the results would be very similar to the sluicing simulation performed for the Proponent's Proposed Project due to the equitable volumes of sediment sluiced for both alternatives. Therefore, the results of that simulation apply to this alternative.

Figure 4.2-20: Typical Cross Section for Alternative 1 (Dam Notching) in the Carmel River Arm

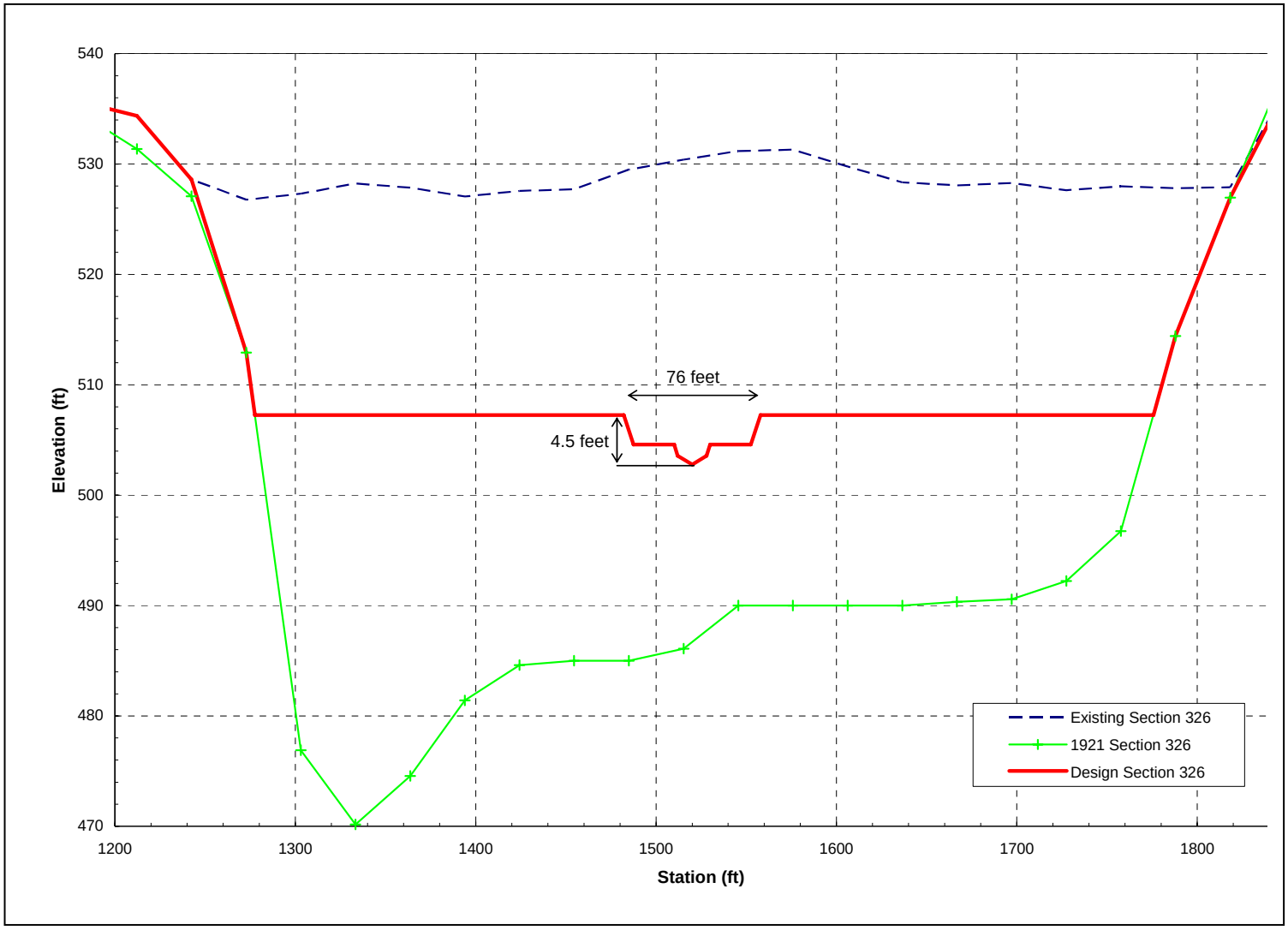


Figure 4.2-21: Typical Cross Section for Alternative 1 (Dam Notching) in the San Clemente Creek Arm

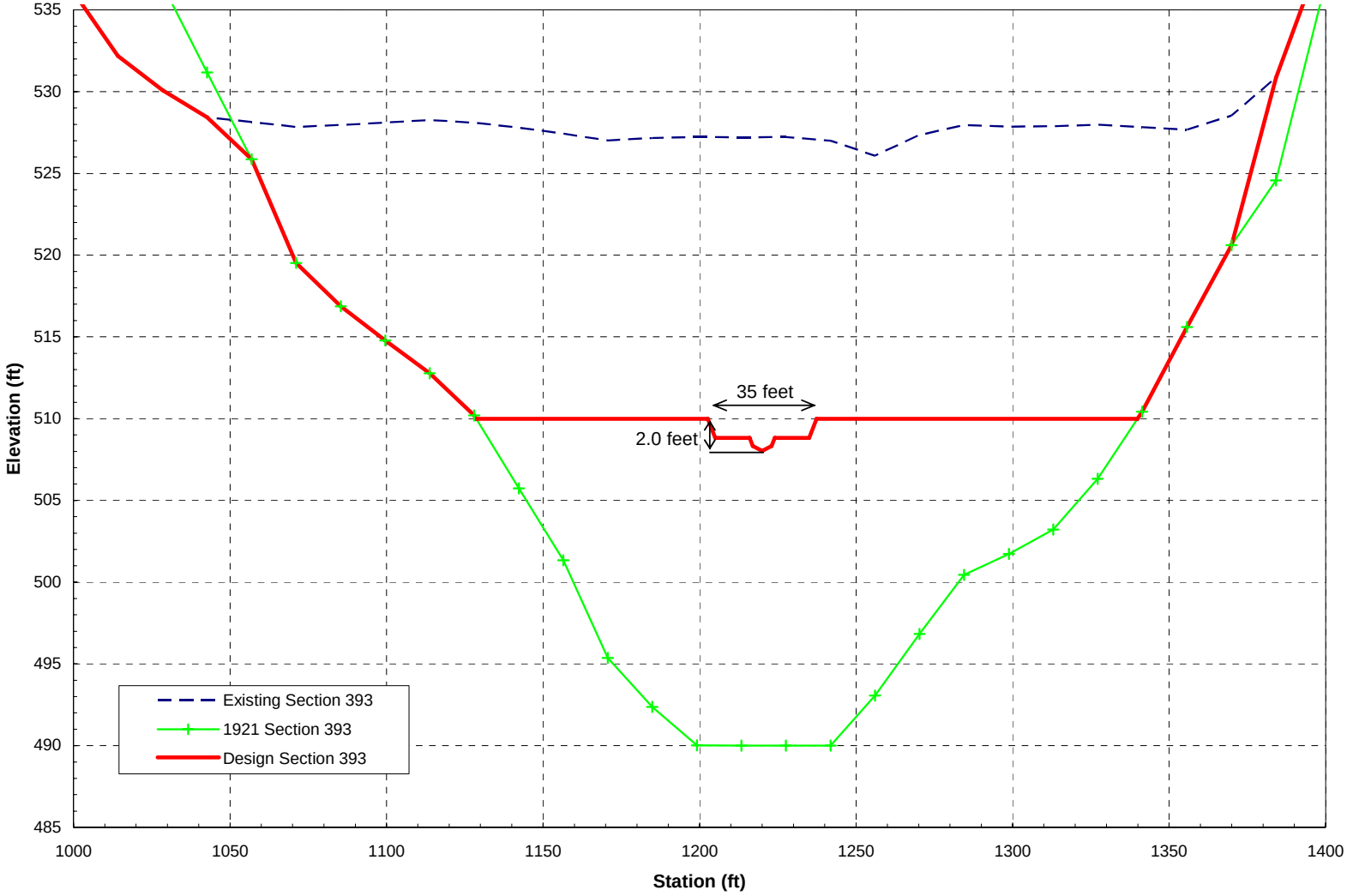
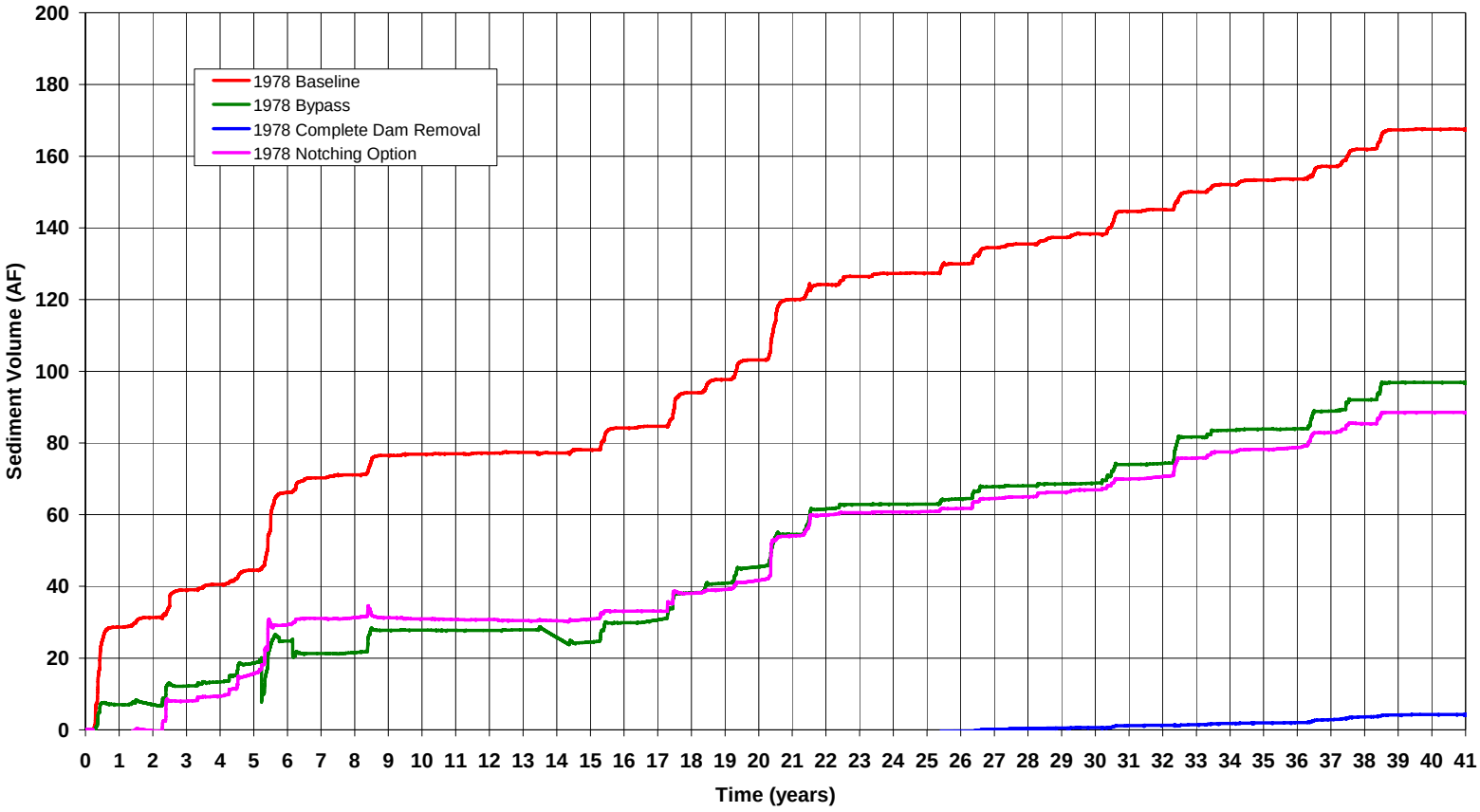
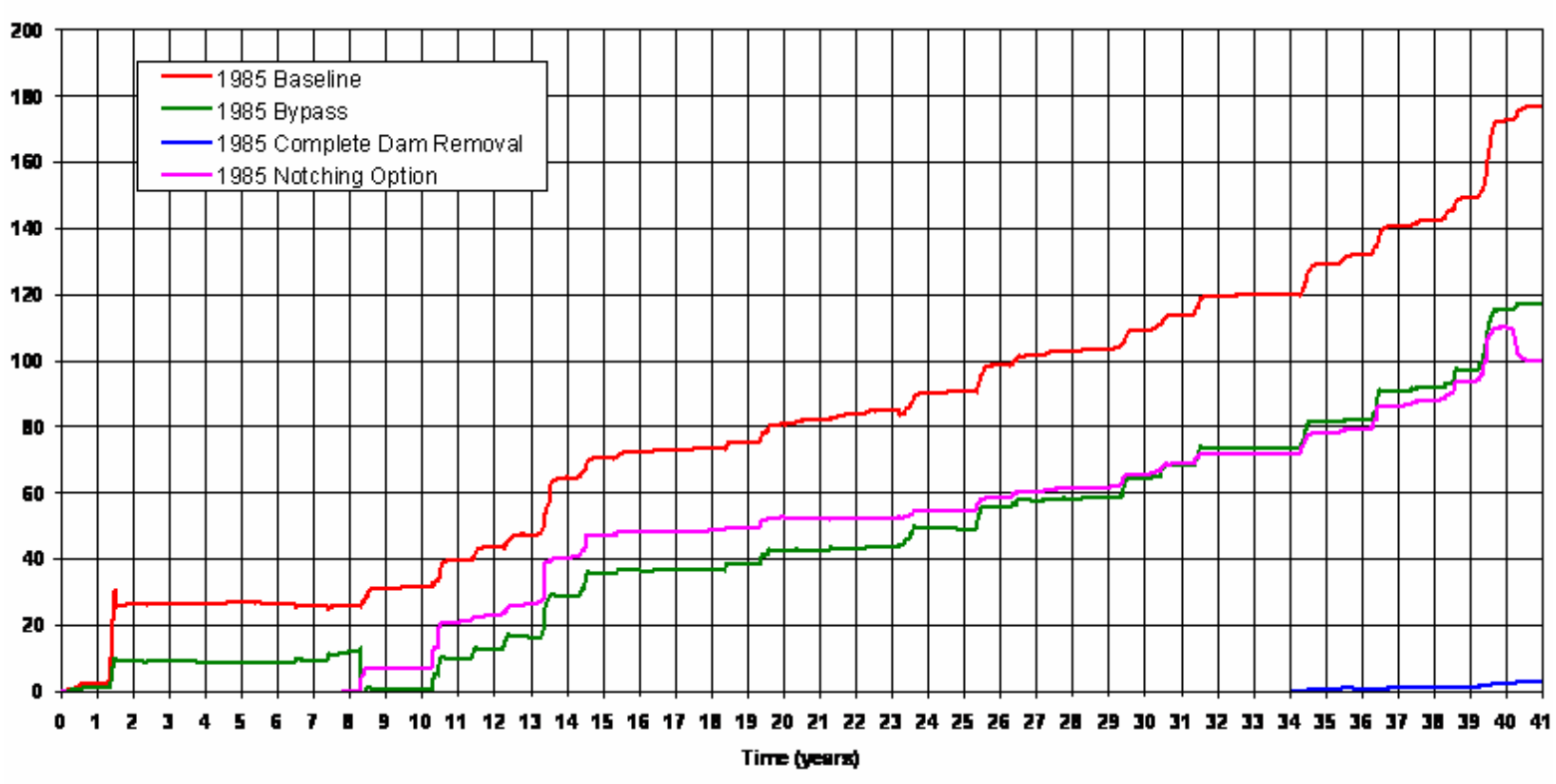


Figure 4.2-22: Total Sediment Volume Stored in San Clemente Dam during the 41-year Simulation, Wet-year Hydrology



Source: MEI 2007b

Figure 4.2-23: Total Sediment Volume Stored in San Clemente Dam during the 41-year Simulation, Dry-year Hydrology



Source: MEI 2007b

MITIGATION

Under Alternative 1, Impact Issue WR-3a would be less than significant with mitigation. See discussion for the Proponent's Proposed Project under Impact Issue WR-3a for mitigation measure of this impact.

WR-3b: Increased Sediment Deposition that Obstructs Fish Passage

During low-flow years, when all the flow is through the fish ladder, sediment would move close to the fish ladder, and possibly impair fish passage from the ladder to the remnant pool
Determination: ***less than significant with mitigation, long-term***

IMPACT

This impact is similar to Impact WR-3b described above for the Proponent's Proposed Project.

MITIGATION

See discussion for the Proponent's Proposed Project under Impact Issue WR-3b for mitigation.

WR-4a: Increased Sediment Deposition in the Lower River

The increased sediment load passing SCD depositing in the Carmel River bed below SCD
Determination: ***less than significant no mitigation required, long-term***

IMPACT

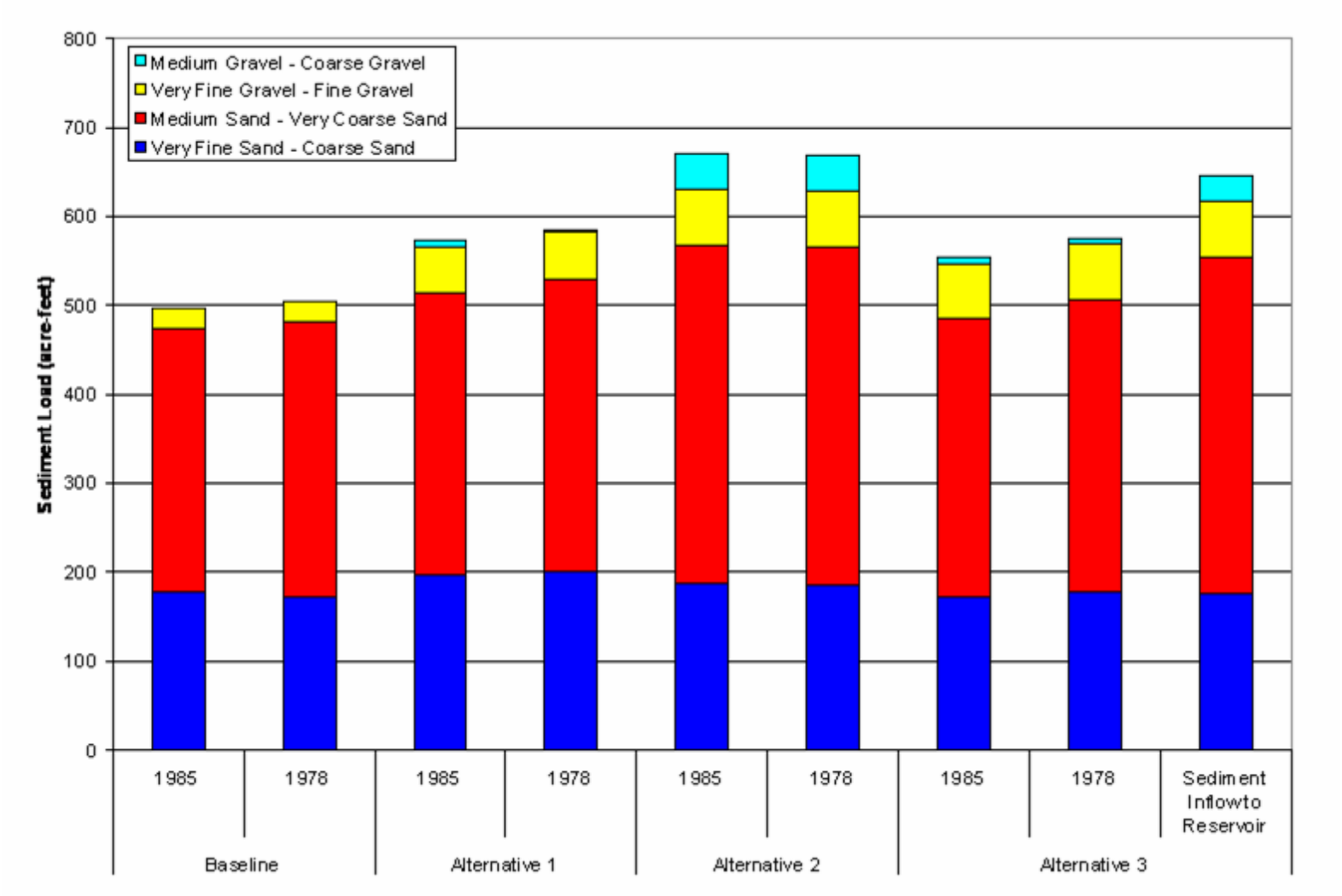
In this Final EIR/EIS, Impact Issues, WR-3a, WR-4b, WR-4a and WR-4b cover sediment management operations after construction, including sluicing activities that were discussed in WR-2, WR-3, and WR-4 in the Draft EIR/EIS.

The historic transport of sediment load down the Carmel River was interrupted by the construction of SCD (this is not an impact of the project, but a baseline condition). However, implementation of this alternative would result in additional sediment passing the Dam and depositing in the lower river. The load passing the Dam would also include sediment in the medium gravel-coarse gravel size fraction, which previously had been retained in the reservoir.

Although this sediment load is less than the total sediment load entering upstream of the Dam, it would be an improvement over baseline conditions and would reestablish some of the sediment continuity in the river.

The simulated sediment load delivered to the lower river under Alternative 1 is shown in Figure 4.2-24. About 585 AF would pass the Dam for the wet-year and 573 AF for the dry-year hydrology. This sediment volume passing SCD to the lower river would be greater than what would be delivered under the baseline conditions.

Figure 4.2-24: Simulated Total Sediment Volume and Size Fraction Passing San Clemente Dam for the 41-year Simulation



Of the sediment that passes SCD, about 58 AF and 60 AF would be stored in the lower river for the wet-year and dry-year hydrology, respectively (Figure 4.2-24 and Figure 4.2-25).

During sluicing events, additional sediment would be released downstream. The total sediment load delivered to the lower river following a sluicing event is similar to the Proponent's Proposed Project.

SCD has been trapping sediment and reducing the supply to the lower river for 86 years. Over time, the river has adjusted to the reduced sediment load by incising or widening the channel. The change in sediment loading to the lower river under Alternative 1 would change sediment supply to the lower river and could alter the channel. Possible changes include raising the channel bed elevation, which could influence flooding. Flooding and changes in channel bed geometry are discussed in Impact Issues WR-5 and WR-6. Simulation of the channel bed elevation as compared to the baseline elevation indicated that Alternative 1 would cause only localized changes in the channel bed elevation; elevation increases would exceed one foot at several locations in the lower river (Figure 4.2-27 and Figure 4.2-28).

Under the wet-year hydrology, the increases in bed elevation would occur in Reaches 8.7 and 4.7, and 4.3. At these locations, the bed elevation would increase over the baseline condition by 1.5 feet, 1.1 feet, and 3.1 feet, respectively. The 3.1-foot change would occur between SCD and the OCRD. These results are discussed further in Impact Issue WR-6 below.

MITIGATION

No mitigation would be required (see discussion for the Proponent's Proposed Project under Impact Issue WR-4a).

WR-4b: Increase in Frequency of High Suspended Sediment Concentrations

High flows will increase sediment concentration in the river and sediment management activities, such as sluicing, would further increase the suspended sediment concentration downstream of the Dam
Determination: ***less than significant, no mitigation required, long-term***

IMPACT

In this Final EIR/EIS, Impact Issues WR-3a, WR-3b, WR-4a, and WR-4b cover sediment management operations after construction, including sluicing activities, which were discussed in WR-2, WR-3, and WR-4 in the Draft EIR/EIS.

Figure 4.2-25: Simulated Total Volume of Sediment Stored in the Carmel River Downstream from San Clemente Dam for the 41-year Simulation, Wet-year Hydrology

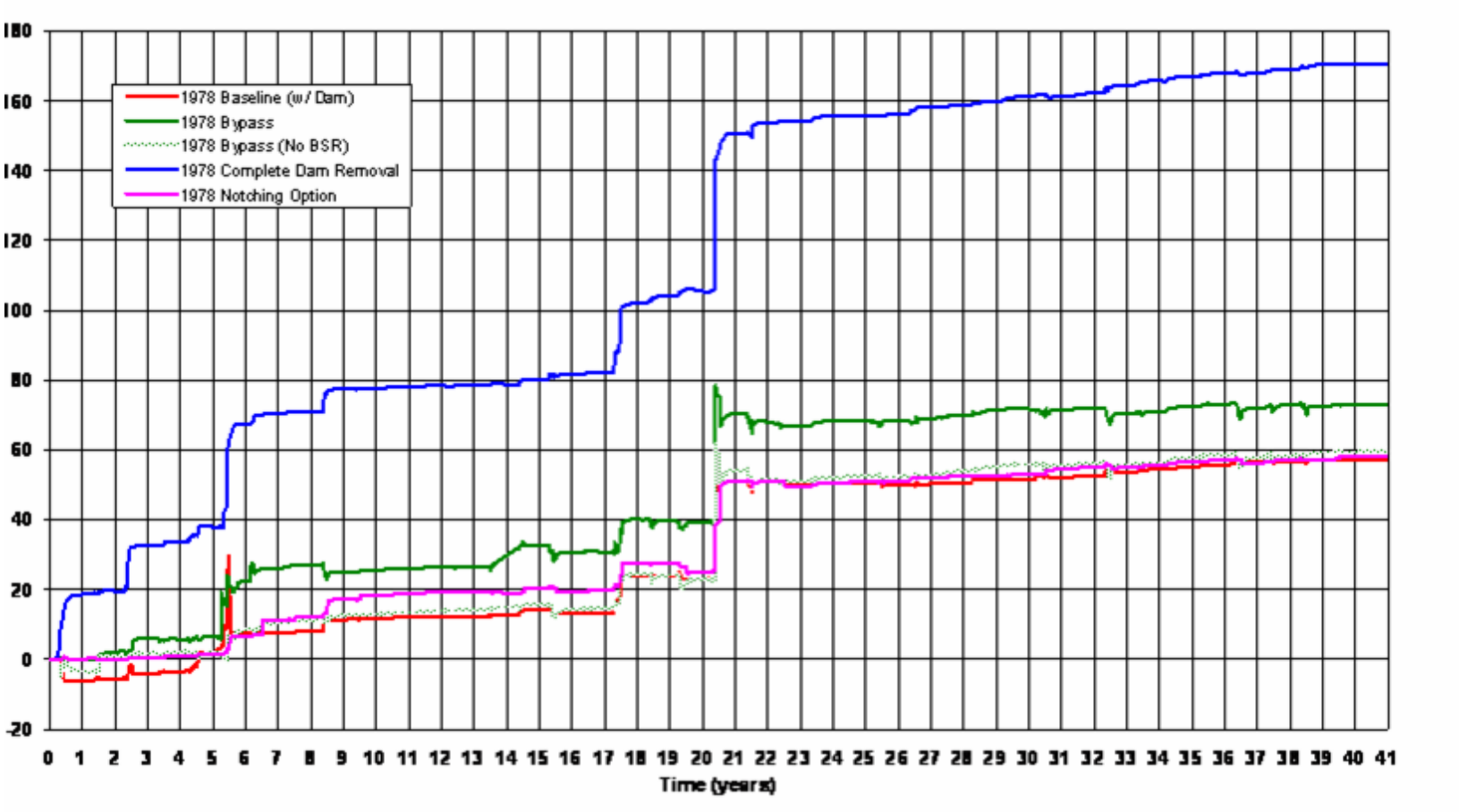


Figure 4.2-26: Simulated Total Volume of Sediment Stored in the Carmel River Downstream from San Clemente Dam for the 41-year Simulation, Dry-year Hydrology

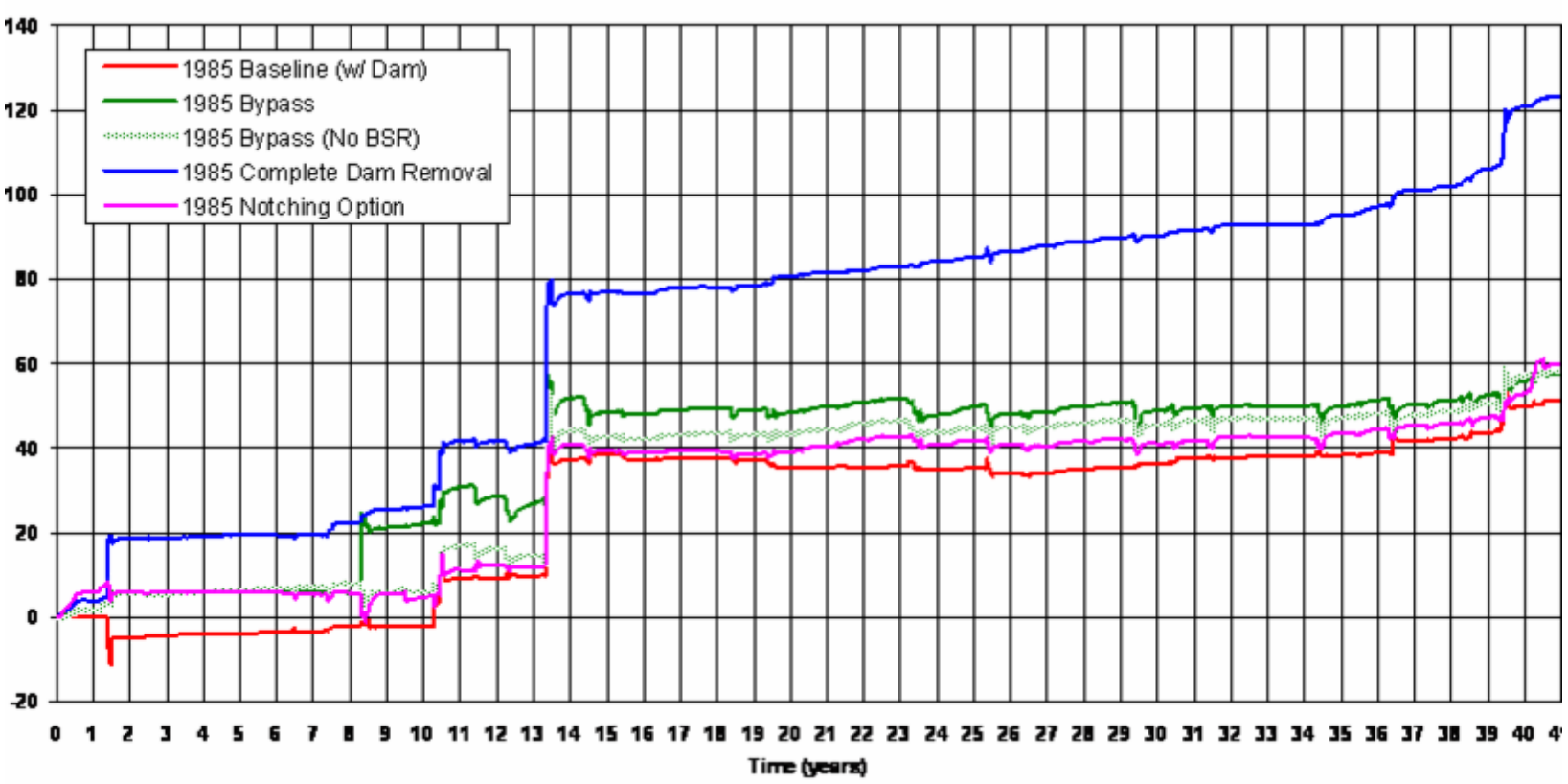


Figure 4.2-27: Maximum Difference in the 100-year Water Surface Elevation in the Carmel River for the Alternatives, Wet-year Hydrology

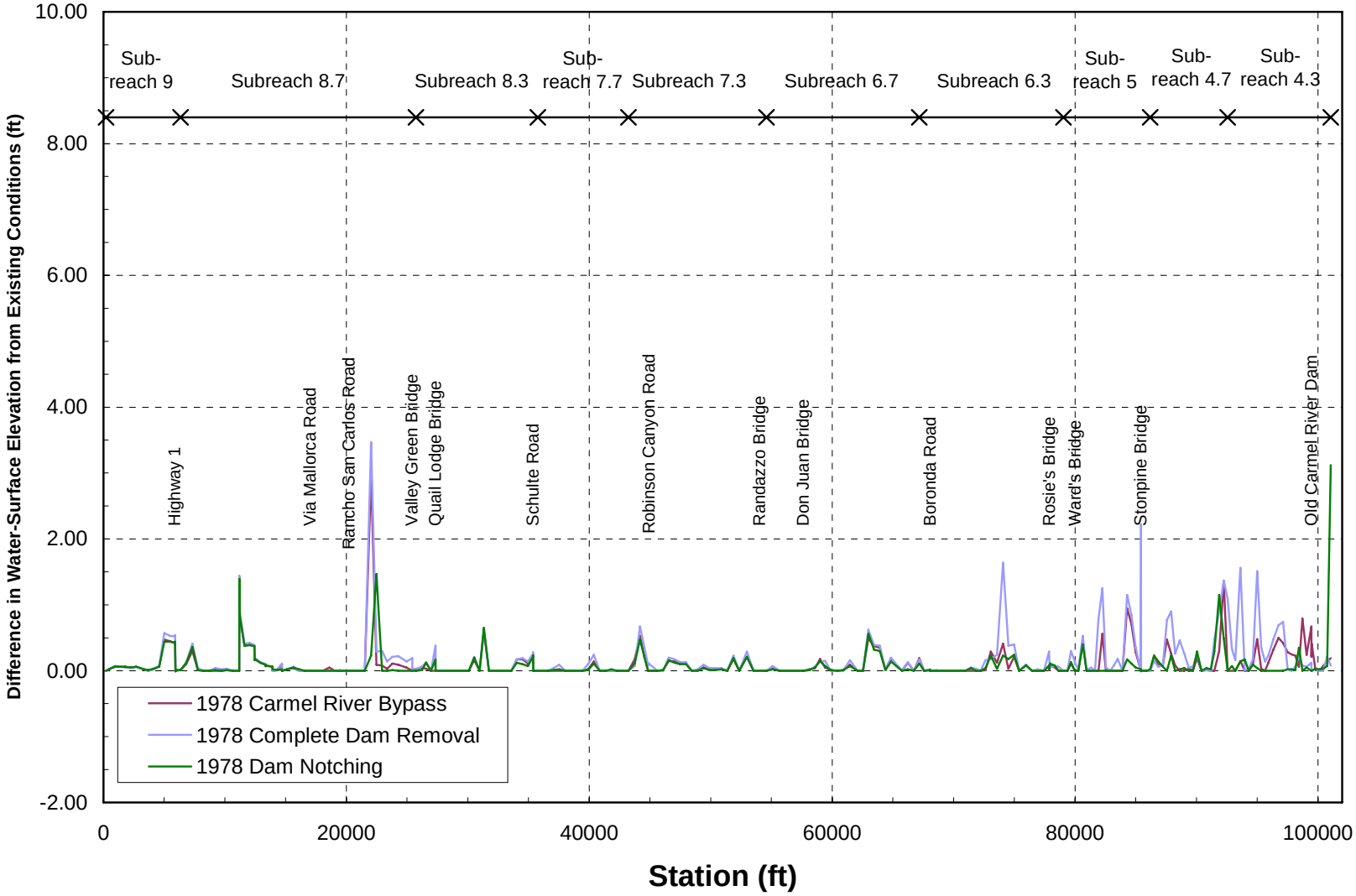
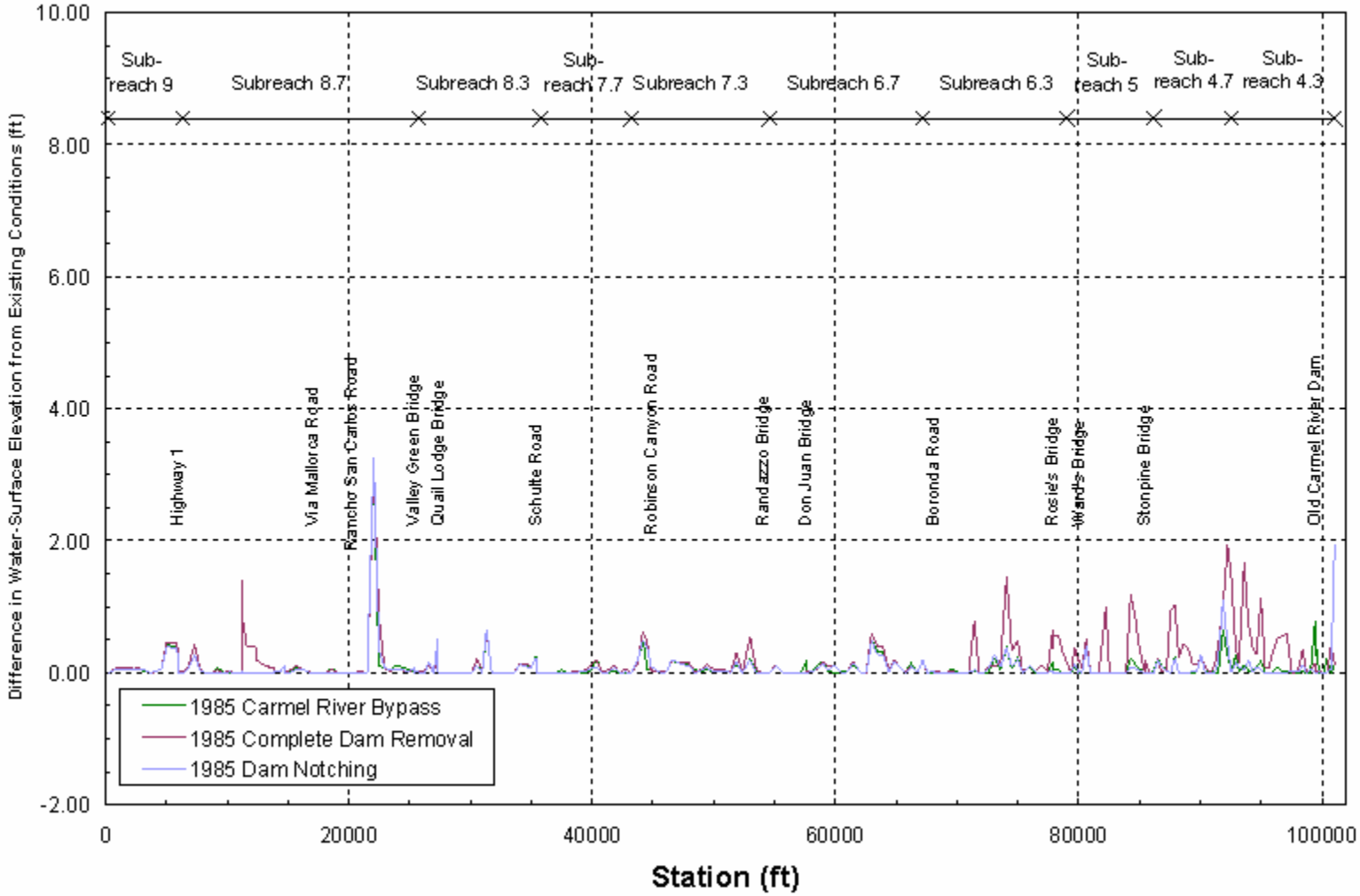


Figure 4.2-28: Maximum Difference in the 100-year Water Surface Elevation in the Carmel River for the Alternatives, Dry-year Hydrology



Implementing Alternative 1 would decrease the amount of sediment trapped in the reservoir, thereby increasing the downstream sediment load. This would result in higher suspended sediment loads during storm events. In addition, sediment management activities such as sluicing, would add to the suspended sediment concentration. However, comparing the difference between simulated storm events with and without sluicing, the percentage of days when the suspended sediment concentration exceeds 500 ppm is increased 0.03 percent for sluicing as indicated in Table 4.2-4.

Suspended sediment concentrations under Alternative 1 were estimated for the lower river based on the modeled sediment loading. The results indicated that the suspended sediment concentration responds to storm events that mobilize sediment (Figure 4.2-17 through Figure 4.2-19). A summary of suspended sediment concentration shows that the concentration is typically below 200 ppm (Table 4.2-6). There are from 23 to 37 days in the simulation period when the suspended sediment concentration exceeds 500 ppm for the wet-year hydrology, and from 23 to 40 days for the dry-year hydrology.

Table 4.2-6: Number of Days with Simulated Suspended Sediment Concentration within Defined Limits for Alternative 1

Wet-year Hydrology										
Concentration (ppm)	**Reach**									
	R4.3	**R4.7**	**R5**	**R6.3**	**R6.7**	**R7.3**	**R7.7**	**R8.3**	**R8.7**	**R9**
Less than 200	14,638	14,619	14,599	14,608	14,594	14,575	14,549	14,575	14,515	14,500
200-400	115	133	144	135	146	159	182	169	223	234
400-500	16	17	24	20	16	20	24	18	21	21
500-600	8	7	9	10	12	15	13	11	12	12
600-800	8	9	7	10	13	14	14	10	11	14
800-1000	3	2	3	3	3	2	3	2	3	4
1000-1200	2	3	3	3	2	1	1	2	3	3
1200-1400	1	1	2	2	3	4	3	3	2	2
1400-1600	0	0	0	0	2	1	2	1	1	1
1600-1800	1	0	0	0	0	0	0	0	0	0
1800-2000	0	1	0	0	0	0	0	0	0	0
>2000	0	0	1	1	1	1	1	1	1	1
Greater than 500	23	23	25	29	36	38	37	30	33	37
Dry-year Hydrology										
Concentration (ppm)	**Reach**									
	R4.3	**R4.7**	**R5**	**R6.3**	**R6.7**	**R7.3**	**R7.7**	**R8.3**	**R8.7**	**R9**
Less than 200	14,634	14,625	14,610	14,604	14,589	14,557	14,553	14,572	14,528	14,485
200-400	117	123	135	140	149	177	179	171	211	251
400-500	18	21	17	17	18	20	20	16	18	20
500-600	7	4	11	12	10	11	14	11	9	10
600-800	8	12	11	10	15	15	14	12	14	15
800-1000	5	3	3	3	3	4	3	3	3	2
1000-1200	1	2	2	3	4	4	4	2	5	5
1200-1400	1	1	2	2	1	1	2	2	1	1
1400-1600	0	0	0	0	2	2	2	2	2	2
1600-1800	1	1	0	0	0	0	0	0	0	0
1800-2000	0	0	0	0	0	0	0	0	0	0
>2000	0	0	1	1	1	1	1	1	1	1
Greater than 500	23	23	30	31	36	38	40	33	35	36

Note: Reach 4.3 is immediately below SCD. Reach 9 is at the lagoon. Simulation period is 41 years.

MITIGATION

No mitigation would be required (see discussion for the Proponent's Proposed Project under Impact Issue WR-4b).

WR-5: Changes in Channel Bed Geometry

Additional sediment passing the Dam to the lower river would aggrade or degrade the river channel or change the channel cross section
Determination: ***less than significant, no mitigation is required, long-term***

IMPACT

Alternative 1 would add 585 AF of sediment to the lower river, with 58 AF stored in the river in a wet-year. The additional sediment would add elevation to the channel bed or alter the channel cross section. Modeling results indicate that at several locations along the channel from the Dam to the ocean, the bed elevation would increase over one foot. However these changes would be localized to a small area and would not impact an entire river reach. Because of the limited extent, changes to the channel bed would not be extensive enough to adversely affect flood conditions in any river reaches. Therefore, this impact would be less than significant.

MITIGATION

In the Draft EIR/EIS, Impact Issue WR-5 was less than significant with mitigation. However, the changes in bed elevation under this alternative would be localized and would not extend throughout the river reach. These localized changes would not be significant and would not result in a wide-scale change in the river geometry. No mitigation would be required.

WR-6: Changes to the 100-year Flood Elevation

The increased sediment loading would alter the bed of the Carmel River and influence the 100-year flood elevation
Determination: ***less than significant, no mitigation required, long-term***

IMPACT

The changes in the downstream sediment loading would influence the bed elevation, which in turn, could alter the flood elevations. Modeling indicates that the bed changes are localized and are not present throughout a full reach in any part of the river. Therefore, these localized changes in bed elevation would not adversely affect flood conditions in any reach of river. This impact would be less than significant.

MITIGATION

In the Draft EIR/EIS, Impact Issue WR-6 was less than significant with mitigation. However, the impacts would be less than significant and no mitigation would be required.

Issue WR-7: Impact to the Location or Timing of Water Supply Diversions

Changes to the location or timing of water supply diversion
Determination: ***less than significant with mitigation, long-term***

IMPACT

Under Alternative 1, the existing CAW point of diversion would be replaced at an elevation of 525 ft. in the immediate vicinity of San Clemente Reservoir (see Section 3.3 of the Project Description). This would avoid the need for extensive improvements to the existing filter plant and would maintain the ability of CAW to divert water from the Carmel River. Alternative 1 would provide for a new water diversion point for the existing water right. The change in point of diversion would require approval of the SWRCB.

MITIGATION

In the Draft EIR/EIS the determination for Impact Issue WR-7 was less than significant and no mitigation was required. Comments to the Draft EIR/EIS pointed out that the diversion could affect fish passage. The diversion would be operated to maintain fish passage flows in Carmel River in January through May while also providing the necessary water supply to the downstream community. Any necessary mitigation for a change in a point of diversion would be addressed by the SWRCB during in the permit process. With mitigation, this impact would be less than significant.

Issue WR-8: Increased Risk of Dam Failure

Risk of dam failure due to seismic activity or flooding, leading to or increasing downstream flooding
Determination: ***less than significant, no mitigation required, long-term***

IMPACT

Please refer to Section 4.1 Geology and Impact Issue GS-1 for a discussion of seismic risks. Under Alternative 1, dam notching would eliminate the potential for dam failure during a MCE and/or PMF.

MITIGATION

In the Draft EIR/EIS, the mitigation discussion for this impact identified the Proponent's Proposed Project and other action alternatives as mitigation for this impact. However, no mitigation would be required for this impact as the San Clemente Dam Seismic Safety Project is designed to withstand a MCE and peak ground accelerations, a condition that cannot be met by the existing dam. The project would satisfy the EIR/EIS purpose and need of eliminating the potential for dam failure during the MCE.

Alternative 2 (Dam Removal)

Because the Dam would be removed, Hydrology/water resources impact WR-8 (Dam Failure) would not occur. Impact WR-7 (Water Supply) would be the same as described for Alternative 1, although the new water diversion would be located further upstream in order to provide the required head. Under Alternative 2, impact WR-2b is the same as impact WR-2a.

WR-1: Changes in Streamflow during Construction

Changes in streamflow downstream of the Dam during construction drawdown, dewatering the plunge pool, or when inflow exceeds the bypass capacity
Determination: ***less than significant, no mitigation required, short-term***

IMPACT

The impact potential would be the same as discussed above for Alternative 1, Impact Issue WR-1. During CY 4, 5, and 6, 1,000 AF of water stored in the reservoir would be released downstream over a 20-day period. The increase in discharge would be approximately 25 cfs, and would be within the range of variability observed for the recorded flows during this time period. This impact would be less than significant.

MITIGATION

No mitigation would be required (see discussion for the Proponent's Proposed Project under Impact Issue WR-1).

WR-2a: Changes in Sediment Flow Passing SCD Immediately After Construction

Changes in the amount of sediment transported from the upper watershed (above SCD) to the lower Carmel River (below SCD) immediately after construction
Determination: ***significant and unavoidable, short-term***

IMPACT

In the Draft EIR/EIS, Impact Issues WR-2 and WR-3 covered both construction and operational impacts. In this Final EIR/EIS, WR-2a includes the construction impacts discussed in WR-2 and WR-3 in the Draft EIR/EIS. Operational impacts are covered in Issues WR-3a, WR-3b, WR-4a, and WR-4b.

Sediment stored behind SCD would be excavated and removed under this alternative. Because of the difficulty in removing all sediment, a residual sediment layer would remain along the canyon walls and channel within the former reservoir. The sediment transport modeling assumed that a one-foot base of residual sediment would remain in the reservoir area after construction.

After years of being submerged by water, then by sediment, the canyon walls would lack stabilizing vegetation. The residual sediment layer would be composed of sands up through gravels, along with cobbles and boulders that pre-date the reservoir. The fine

gravel would rapidly wash off the hillsides in rain events and would be available for transport downstream.

Because the Dam would be removed under Alternative 2, the full annual sediment load plus a portion of the residual sediment remaining in the reservoir area would pass the Dam site to the lower river.

MITIGATION

Following sediment excavation, geomorphically stable channels would be designed and constructed though the reservoir to the confluence of the San Clemente Creek and Carmel River channels. These channels would have the necessary slope and dimensions to convey the flow and estimated sediment loads. Channel reconstruction would take place though selective contouring along both the Carmel River and San Clemente Creek, to achieve the following objectives:

- The formation of a relatively wide river/creek valley by the remaining alluvial deposits that would generally follow the 1921 contours along the upper reaches of the river/creek and into the reservoir.
- The creation of a bankfull channel approximately sized for a two-year flood event.
- The creation of a low flow channel capable of passing median annual flows.
- The bankfull and thalweg channels would be constructed with limited grading of the existing alluvial deposits. Bank stabilization procedures such as vegetative matter and plantings would be used to limit erosion and sediment transport. (MWH 2005).

A stream restoration plan will be prepared as part of final design for this alternative, and will include mitigation for the increase in sediment supply following construction. Revegetation of the hillsides would also reduce the long-term potential for sediment erosion as discussed in Appendix K (SWPPP) and Appendix U (Botanical Resources Management Plan).

However, even with the mitigation discussed above, the short-term impact will be significant and unavoidable.

WR-3a: Change in Sediment Deposition in the Reservoir

Changes in the amount of sediment deposited in the reservoir upstream of the SCD
Determination: ***less than significant, no mitigation required, long-term***

IMPACT

In this Final EIR/EIS, Impact Issues WR-3a, WR-3b, WR-4a, and WR-4b cover sediment management operations after construction, including issues discussed in WR-2, WR-3 and WR-4 in the Draft EIR/EIS.

At the end of construction, sediment would only be trapped upstream of the current SCD in the floodplain of the reconstructed channel. The channel and floodplain would be designed to pass low-flows and flood-flows and convey the sediment load. Therefore, any deposition in the channel would be within the expected design limits and would not be a significant impact.

Alternative 2 would allow the background sediment load of the river to flow, unimpeded, downstream. The natural sediment load present upstream of the reservoir has not been available to the lower river since before the Dam was constructed.

The Carmel River and San Clemente Creek channels upstream of the Dam would be re-constructed at a slope similar to the pre-dam channel slope. Through the reservoir, this would be a steep slope compared to existing conditions and the river would efficiently transport sediment through the reconstructed channel. Sediment would continue to be stored in the floodplain of each watercourse through the reservoir area during moderate flows and would be released from the floodplain during high flows. Over the long-term, under Alternative 2, the full natural sediment load would be conveyed downstream to the lower Carmel River. The assumed channel cross sections used in the sediment transport modeling are shown in Figure 4.2-29 and Figure 4.2-30

Under this Alternative, the reservoir would be drawn down prior to demolition of the Dam. Under Alternative 2 an estimated 1,555 AF of sediment would be removed from behind the Dam to near the depth of the 1921 streambed.

The existing reservoir area cannot be completely excavated to remove the stored sediment because of the underlying canyon shape and the presence of obstacles such as large rocks. The canyon hillsides that were previously inundated would be barren for several years until vegetation becomes established. Until that time, the hillsides of the former reservoir would be subject to erosion or possible landslides that would add additional sediment to the river.

The sediment transport simulations suggest that only a small amount of sediment would accumulate upstream of the current location of the Dam under this alternative. The amount of accumulated sediment is simulated to be 4 AF for the wet-year and 3 AF for the dry-year hydrology at the end of the 41 year simulation. The stored sediment would occur in the overbank areas (the floodplain) of the reconstructed channels of the Carmel River and San Clemente Creek.

MITIGATION

This impact would be less than significant, and no mitigation would be required. This is consistent with the Draft EIR/EIS text, where long-term sediment management operational issues were identified as less than significant after mitigation and potentially beneficial.

Figure 4.2-29: Typical Cross Section for the Alternative 2 (Complete Dam Removal) in the San Clemente Creek Arm

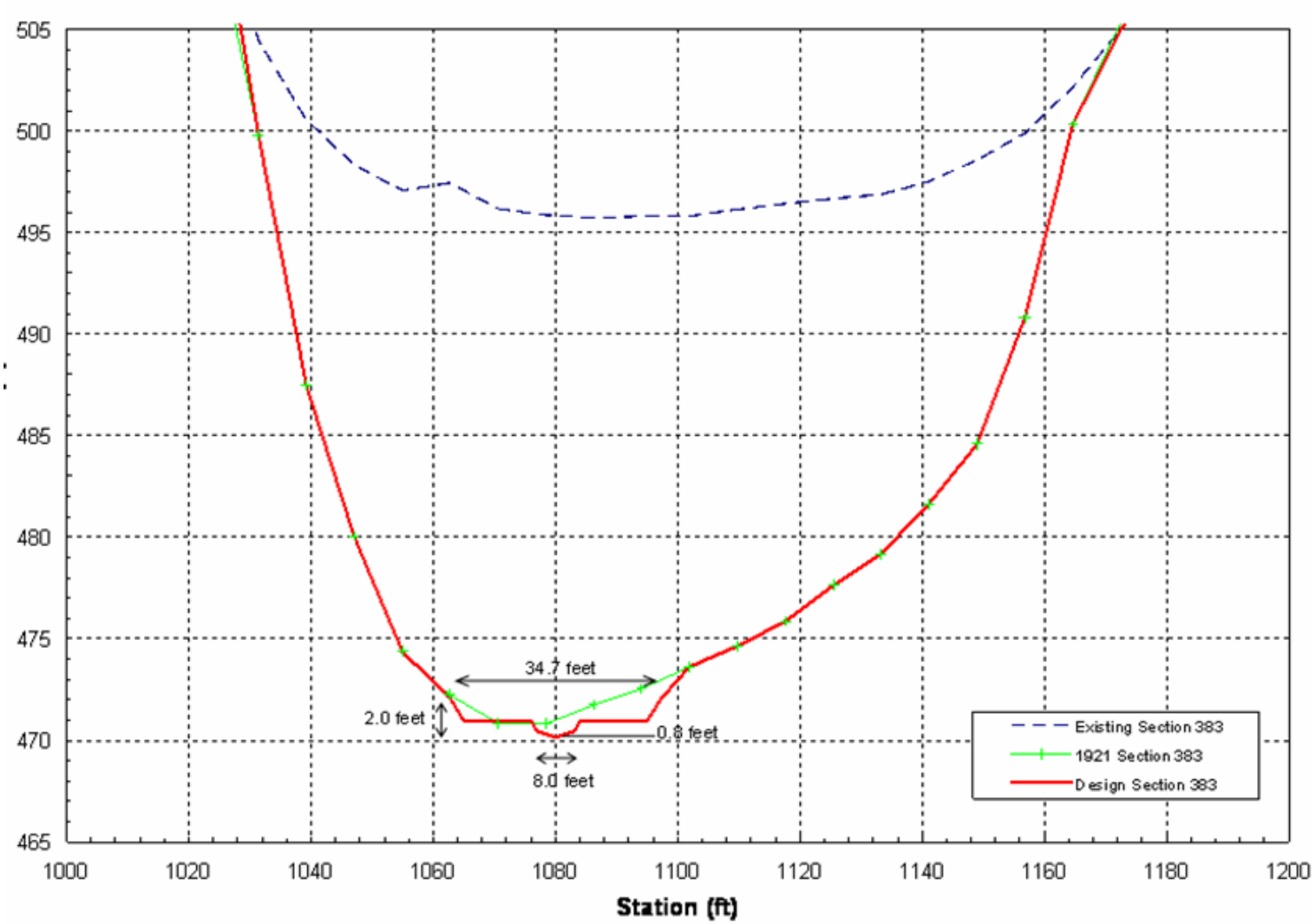
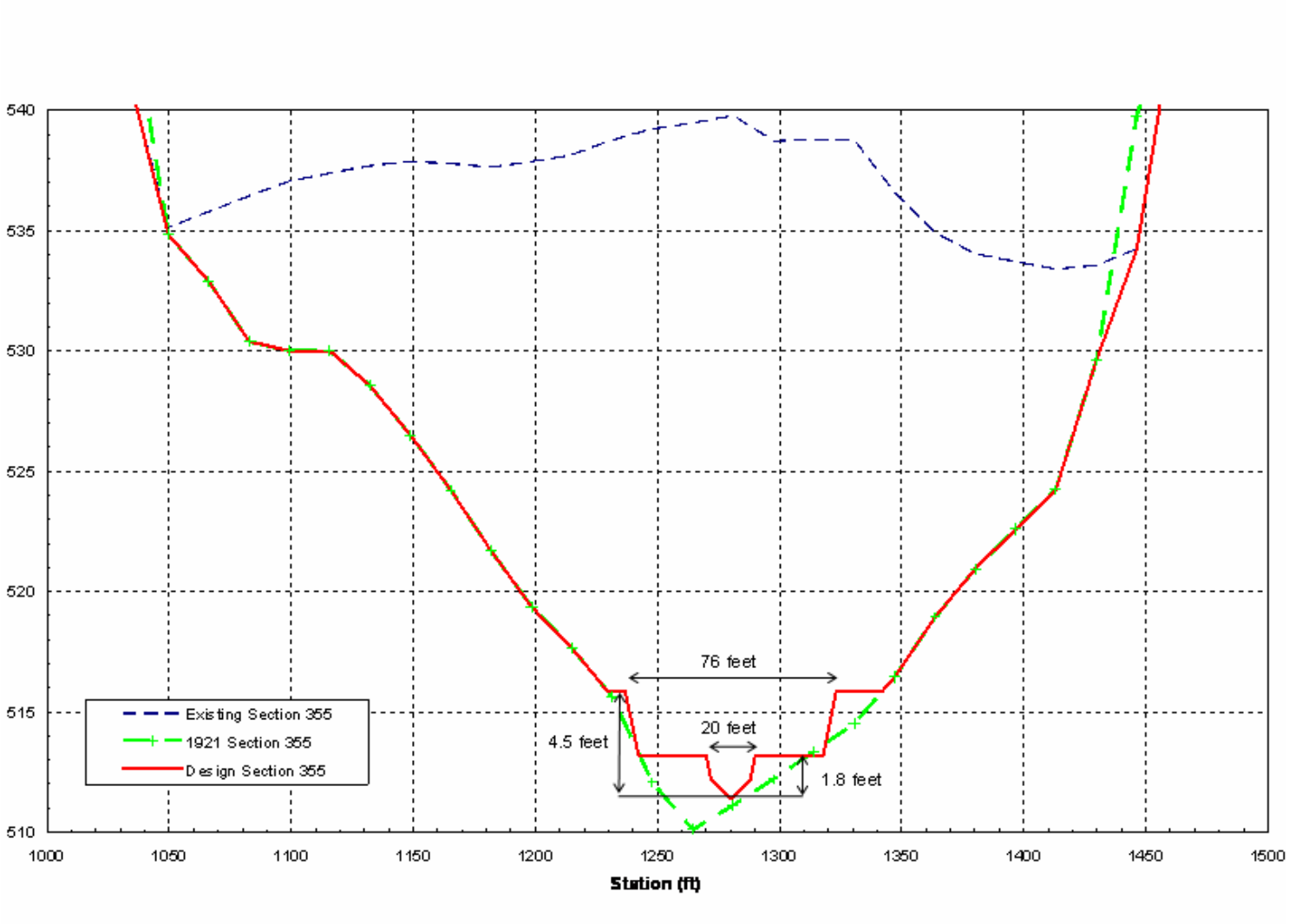


Figure 4.2-30: Typical Cross Section for the Alternative 2 (Complete Dam Removal) in the Carmel River Arm



WR-3b: Increased Sediment Deposition that Obstructs Fish Passage

During low-flow years, when all the flow is through the fish ladder, sediment would move close to the fish ladder, and possibly impair fish passage from the ladder to the remnant pool
Determination: ***less than significant, no mitigation required, long-term***

IMPACT

In this Final EIR/EIS, Impact Issues WR-3a, WR-3b, WR-4a, and WR-4b cover sediment management operations after construction that were discussed in WR-2, WR-3 and WR-4 in the Draft EIR/EIS.

The only potential fish passage obstruction under this alternative would occur from deposition in the restored channel upstream of the Dam. As stated above under WR-3a, the channel would be designed to pass low-flows and flood-flows and convey the sediment load. Therefore, blockage should not occur near the existing SCD site. This would be a less than significant impact.

MITIGATION

This impact would be less than significant and no mitigation would be required. This is consistent with the Draft EIR/EIS text, where long-term sediment management operational issues were identified as less than significant after mitigation and potentially beneficial.

WR-4a: Increased Sediment Deposition in the Lower River

Increased sediment load passing SCD and depositing in the Carmel River bed below SCD
Determination: ***significant and unavoidable, long-term***

IMPACT

In this Final EIR/EIS, Impact Issues WR-3a, WR-3b, WR-4a, and WR-4b cover sediment management operations after construction that were discussed in WR-2, WR-3 and WR-4 in the Draft EIR/EIS.

Implementing Alternative 2 would result in a larger amount of sediment flowing past the Dam to the lower river than the other alternatives (Table 4.2-3 and Figure 4.2-24).

The full annual natural sediment load would pass downstream of SCD site under this alternative. This condition has not occurred in the lower river for 86 years. Furthermore, the current downstream channel has adjusted to the reduced sediment supply. Alternative 2 would result in the largest sediment accumulation in the lower river of all the alternatives (Figure 4.2-25 and Figure 4.2-26). Under the 41-year simulation, about 669 AF of sediment would pass downstream and 170 AF would be stored in the lower river for the wet-year and about 670 AF of sediment would pass downstream and 123 AF would be stored in the lower river for the dry-year hydrology. Of the sediment stored in the lower river, about 40 AF would be medium gravel to coarse gravel.

By removing the Dam under Alternative 2, there would no longer be any control on the movement of sediment to the lower river. The natural background load plus the residual sediment in the reservoir area would move downstream. In addition, any event that generates excess sediment, such as a wildfire or landslide would add sediment that would flow directly to the lower river.

The sediment that deposits in the lower river may influence localized flooding. The results of the sediment transport analysis showed that the bed of the river would be raised by the deposition of sediment downstream of SCD (Figure 4.2-27 and Figure 4.2-28). The increase in be elevation would be localized and not present throughout a river reach.

Increases in bed elevation of more than one foot were simulated for Reaches 8.7, 6.3, 5, 4.7, and 4.3 for the wet-year hydrology. The increase in Reach 8.7 would be 3.5 feet; in the upstream reaches, elevations would increase by 1 to 2.1 feet over baseline. Under the dry-year hydrology, the bed elevation would increase over the baseline by more than one foot in Reaches 8.3 and 4.7, and in reach 8.7 by 3.1 feet.

MITIGATION

In the Draft EIR/EIS, long-term sediment management operational issues were identified as less than significant after mitigation and potentially beneficial. However, the additional studies performed to measure sediment load indicated that under Alternative 2, increased sediment deposition in the Carmel River below the SCD site would be significant and unavoidable and could not be mitigated.

WR-4b: Increase in Frequency of High Suspended Sediment Concentrations

High flows will increase sediment concentration in the river and sediment management activities, such as sluicing, would further increase the suspended sediment concentration downstream of the Dam
Determination: ***significant and unavoidable, long-term***

IMPACT

In this Final EIR/EIS, Impact Issues WR-3a, WR-3b, WR-4a, and WR-4b cover sediment management operations after construction that were discussed in WR-2, WR-3 and WR-4 in the Draft EIR/EIS. Operational sediment management activities, such as sluicing do not apply to Alternatives 2, 3, and 4.

However, the additional sediment load in the lower river would move downstream during high flows. This would result in higher suspended sediment concentrations relative to baseline conditions. Sediment modeling indicated that high concentrations would occur more frequently under this alternative.

Although sediment movement would occur with or without the Dam in place, a greater number of high suspended sediment concentration days would occur with SCD

removed than when it is retained. Moreover, the lower river would be exposed to the full sediment load that would be present upstream of the reservoir, a condition that has not occurred in the lower river since before the Dam was built.

Simulated suspended sediment concentrations for the 41-year period for Alternative 2 are shown in Figure 4.2-17 through Figure 4.2-19. The concentration would be typically less than 200 ppm but would increase during storm events. Table 4.2-7 shows the simulated number of days that suspended sediment concentrations would increase. Throughout most of the 41-year simulation period, suspended sediment concentrations would be less than 200 ppm. However, Alternative 2 would result in a larger number of days with higher concentrations than the baseline.

Table 4.2-7: Number of Days with Simulated Suspended Sediment Concentration within Defined Limits for Alternative 2

Wet-year Hydrology										
Concentration	**Reach**									
(ppm)	**R4.3**	**R4.7**	**R5**	**R6.3**	**R6.7**	**R7.3**	**R7.7**	**R8.3**	**R8.7**	**R9**
Less than 200	14,492	14,504	14,488	14,508	14,530	14,519	14,529	14,537	14,488	14,487
200-400	233	223	244	227	198	200	196	198	241	248
400-500	18	23	20	18	19	26	26	22	25	17
500-600	18	17	14	15	16	17	14	11	13	15
600-800	18	12	14	11	16	15	13	14	13	14
800-1000	6	7	4	6	4	5	5	2	4	4
1000-1200	4	3	3	2	3	3	3	3	4	2
1200-1400	1	1	4	3	3	3	3	2	1	2
1400-1600	1	1	0	1	2	2	2	2	2	2
1600-1800	0	0	0	0	0	0	0	0	0	0
1800-2000	0	0	0	0	0	1	0	0	0	0
>2000	1	1	1	1	1	1	1	1	1	1
Greater than 500	49	42	40	39	45	47	41	35	38	40
Dry-year Hydrology										
Concentration	**Reach**									
(ppm)	**R4.3**	**R4.7**	**R5**	**R6.3**	**R6.7**	**R7.3**	**R7.7**	**R8.3**	**R8.7**	**R9**
Less than 200	14,480	14,520	14,514	14,542	14,532	14,522	14,514	14,521	14,463	14,460
200-400	248	215	225	191	195	199	207	213	262	268
400-500	23	22	13	21	24	28	27	20	26	25
500-600	17	13	18	14	14	16	17	14	14	13
600-800	10	11	10	12	13	14	12	13	14	13
800-1000	8	5	5	5	6	5	6	2	4	4
1000-1200	3	4	4	2	3	2	3	3	3	5
1200-1400	1	0	1	3	2	3	3	3	3	1
1400-1600	1	1	1	1	2	2	2	2	2	2
1600-1800	0	0	0	0	0	0	0	0	0	0
1800-2000	0	1	0	0	0	0	0	0	0	0
>2000	1	0	1	1	1	1	1	1	1	1
Greater than 500	41	35	40	38	41	43	44	38	41	39

Note: Reach 4.3 is immediately below SCD. Reach 9 is at the lagoon. Simulation period is 41 years.

There would be between 35 and 49 days with the concentration exceeding 500 ppm under the wet-year hydrology and 35 to 44 days under the dry-year hydrology.

Appendix P shows that suspended sediment concentrations under Alternative 2 would be the highest of all the project alternatives from Reach 4.7 downstream to Reach 8.7,

at which point concentrations would become similar to the other alternatives. For example, at Reach 4.7, a concentration of 300 ppm would be exceeded about five percent of the time under Alternative 2 and about one percent of the time under the other project alternatives (Figure P-2). This alternative is simulated to have the highest frequency of suspended sediment concentration above about 300 ppm for reach 4.3 (Figure P-1).

MITIGATION

In the Draft EIR/EIS, this impact issue was identified as less than significant after mitigation and potentially beneficial. However, the additional studies performed to measure suspended sediment concentrations show that under Alternative 2, increases in frequency of high suspended sediment concentrations would be significant and unavoidable and could not be mitigated.

WR-5: Changes in Channel Bed Geometry

Additional sediment passing the Dam to the lower river would aggrade or degrade the river channel or change the channel cross section
Determination: ***significant and unavoidable, long-term***

IMPACT

Based on sediment transport modeling, 170 AF of sediment would be stored in the lower river for the 41-year simulation (for wet-year hydrology). This would be three times the level simulated for the baseline. The deposition would result in increases of more than one foot relative to the baseline in the channel bed elevation in Reaches 8.7, 6.3, 5, 4.7, and 4.3 of the river. While each of these increases would be localized in each of these reaches, the extent of the increases reflect changes to the channel cross section that would force the river to adjust to maintain equilibrium.

MITIGATION

In the Draft EIR/EIS, long-term changes in channel bed geometry were identified as less than significant after mitigation. However, the additional studies performed to measure sediment load show that under Alternative 2, changes in channel bed geometry would be significant and unavoidable and could not be mitigated.

WR-6: Changes to the 100-year Flood Elevation

The increased sediment loading would alter the bed of the Carmel River and influence the 100-year flood elevation
Determination: ***significant and unavoidable, long-term***

IMPACT

Modeling results indicate that at several cross sections of the lower river, the bed elevation would increase under this alternative. Such an increase in the channel bed could cause floodwater to break out of the channel or result in additional erosion in the channel. This result would be most notable in Reach 4.7 and Reach 4.3, where there

are numerous cross sections with increased bed elevations of one to two feet. This could potentially result in flooding because much of the buildup of the channel bed would result from an increase in the amount of coarse material that passes SCD under this alternative. This material does not move as easily as the finer grained material of the baseline condition and may not wash from the channel during a flood.

MITIGATION

Under Alternative 2, the Applicant would monitor the downstream sediment accumulation to measure changes in bed elevation. The 100-year flood model would be rerun to estimate flood elevations if bed elevations have increased by more than 0.5 feet from the baseline condition. If the flood model indicates flooding would impact developed areas due to these bed elevations changes, the Applicant would work with the appropriate agencies to initiate a channel restoration project to remove sediment and reduce the impact. In the Draft EIR/EIS, long-term changes to the 100-year floodplain were identified as less than significant after mitigation. However, the additional studies performed to measure sediment load show that even with mitigation, under Alternative 2, changes to the 100-year floodplain would be significant and unavoidable.

Alternative 3 (Carmel River Reroute and Dam Removal)

Impacts and mitigation for Hydrology/Water Resources Issues WR-1 (Changes in Streamflow), WR-2a, and WR-2b would be similar to those described for Alternative 2. Issues WR-6 and WR-7 would be similar to those described in Alternative 1. Impact Issue WR-8 (Dam Failure) would not occur under Alternative 3, since the Dam would be removed.

WR-3a: Change in Sediment Deposition in the Reservoir

Changes in the amount of sediment deposited in the reservoir upstream of SCD
Determination: ***less than significant, no mitigation required, long-term***

IMPACT

In this Final EIR/EIS, Impact Issues WR-3a, WR-3b, WR-4a, and WR-4b cover sediment management operations after construction, including issues discussed in WR-2, WR-3 and WR-4 in the Draft EIR/EIS.

This impact would differ from conditions described under Alternative 2 in that additional sediment storage would occur in the Carmel River reservoir area. The storage would occur upstream of the diversion dike. About 97 AF would be stored in the reservoir for the 41-year simulation and about 576 AF would pass SCD. There would also be storage in the floodplain of the reconstructed channel in the San Clemente Creek arm.

Under Alternative 3, the Dam would be removed and a channel constructed that would divert water from the Carmel River to San Clemente Creek. The upstream end of the new channel would have a diversion dike to maintain a stable bed elevation for the

Carmel River upstream of the new channel. The Carmel River upstream of the dike is within the reservoir and therefore, the channel has formed on sediment deposits. Without this dike, the Carmel River bed would degrade until it reaches equilibrium or bedrock in the channel. Bedrock is about 30 feet below the surface sediments at the location of the dike. Figures illustrating the diversion dike (see Chapter 3.0 Project Description) include 3.5-1, 3.5-2, and 3.5-3. Additional information on the construction of the dike is located in Section 3.5.4.

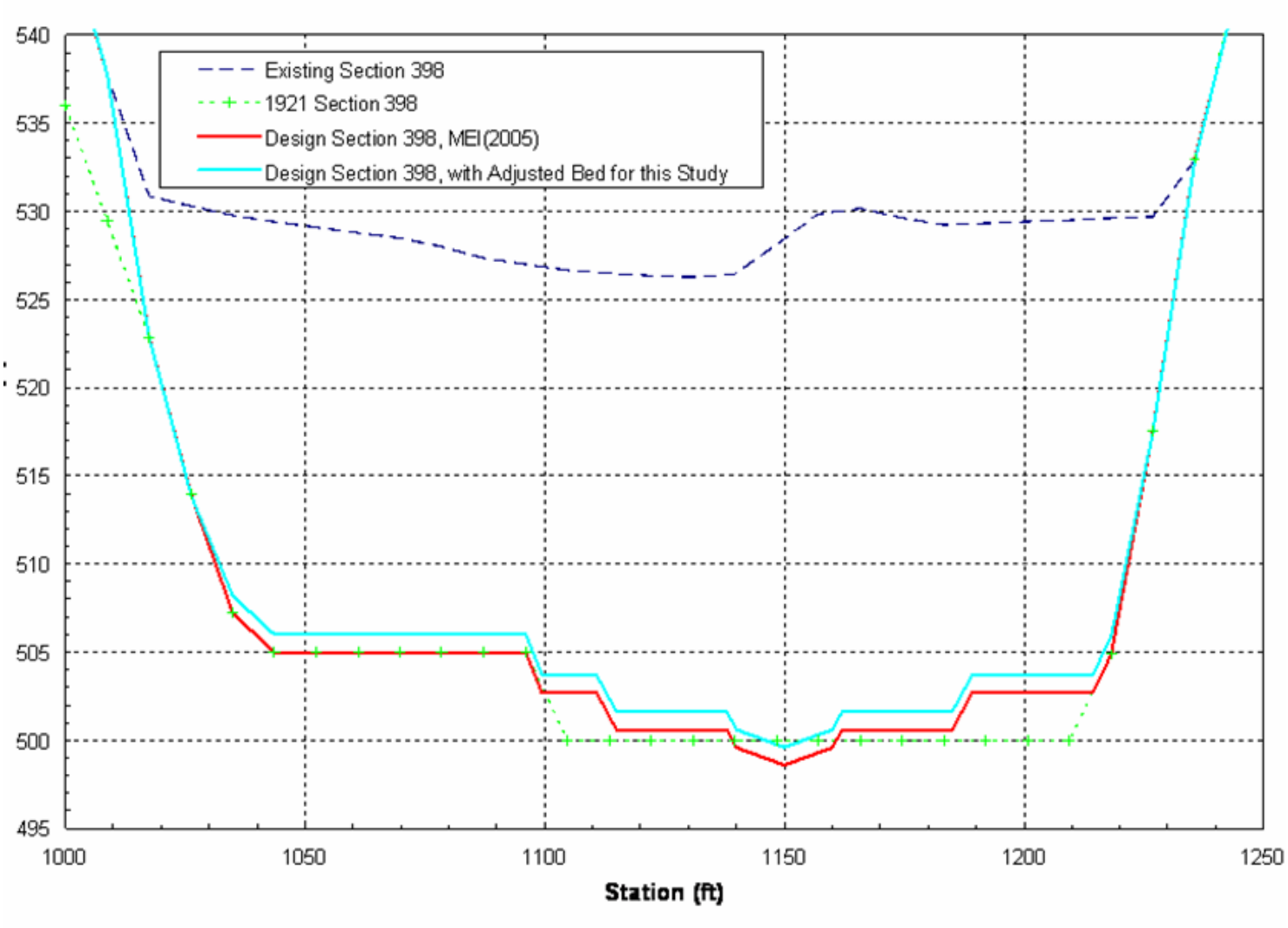
Following dam removal and sediment excavation and stabilization as described in Chapter 3.5, a geomorphically stable channel would be constructed upstream from the dam site through the area exposed by excavation to the natural channel bed in San Clemente Creek. A new bypass channel would be constructed from San Clemente Creek to the Carmel River. The channels would be designed with the appropriate slopes and dimensions to convey the estimated sediment loads without excessive deposition or scour (Figure 4.2-31). The sediment in the San Clemente Creek arm would be relocated to the Carmel River arm downstream of the bypass channel and capped to isolate the sediment from river flows. The bypass channel would be geomorphically stable and maintain grade-control to limit erosion of the existing deposits upstream from the head of the inlet (MEI 2005).

Alternative 3 would result in reservoir-area sediment storage similar to Alternative 1. About 97 AF of sediment would be stored in the reservoir for the wet-year, and 117 AF for the dry-year hydrology. The sediment would be stored in the Carmel River upstream of the dike and in the floodplain of the reconstructed channel through the San Clemente Creek arm (Figure 4.2-22 and Figure 4.2-23). The amount of sediment passing SCD to the lower river would be less than the total sediment supplied to the reservoir. About 556 AF and 576 AF of sediment would pass SCD to the lower river for the wet and dry-year hydrology, respectively.

MITIGATION

This impact would be less than significant and no mitigation would be required. This is consistent with the Draft EIR/EIS text, where long-term sediment management operational issues upstream of the dam site were identified as less than significant after sediment excavation and design of geomorphically stable channels.

Figure 4.2-31: Typical Cross Section for Alternative 3 (Carmel River Bypass) in the San Clemente Creek Arm



WR-3b: Increased Sediment Deposition that Obstructs Fish Passage

During low-flow years, when all the flow is through the fish ladder, sediment would move close to the fish ladder, and possibly impair fish passage from the ladder to the remnant pool
Determination: ***less than significant with mitigation, long-term***

IMPACT

In this Final EIR/EIS, Impact Issues WR-3a, WR-3b, WR-4a, and WR-4b cover sediment management operations after construction, including issues discussed in WR-2, WR-3 and WR-4 in the Draft EIR/EIS.

Potential for blockage of fish passage would occur under this alternative from deposition in the channel and at the diversion dike. The channel upstream of the diversion dike would have a low-flow channel that allows fish passage. This channel would continue to function as it has in the past and fish passage would be available. Fish also would have to traverse the bypass channel and the dike to move from the San Clemente Creek arm to the Carmel River arm. The bypass channel and the San Clemente Creek channel would be steep (2.9 percent) relative to the current channel through the stored sediment (2.5 percent), but not be so steep as to become a barrier to fish migration.

MITIGATION

Both the reconstructed channel and the new bypass channel must be designed to allow fish passage. The design would include runs and pools that reflect a geomorphically stable channel and the passage requirements for the fish. This impact is less than significant with mitigation. This is consistent with the Draft EIR/EIS where long-term sediment management operational issues were identified as less than significant after sediment excavation and design of the geomorphically stable channels.

WR-4a: Increased Sediment Deposition in the Lower River

The increased sediment load passing SCD deposit in the Carmel River bed below SCD
Determination: ***less than significant, long-term***

IMPACT

In this Final EIR/EIS, Impact Issues WR-3a, WR-3b, WR-4a, and WR-4b cover sediment management operations after construction, including issues discussed in WR-2, WR-3 and WR-4 in the Draft EIR/EIS.

Alternative 3 would result in additional sediment passing SCD and being stored in the lower river relative to existing conditions. The sediment would include coarse gravels that were not previously available to the lower river. The magnitude of the sediment flow would be similar to Alternative 1. However, because the Dam would be removed, large sediment flows from the watershed from extreme events such as fires could not be controlled and would move downstream.

The sediment that passes SCD would be stored in the lower river or would flow to the ocean. Under the 41-year simulation about 576 AF of sediment would pass SCD during a wet year and 556 AF would pass the Dam during a dry year. About 73 AF of the sediment passing the Dam would be stored in the lower river for the wet-year and 57 AF for dry-year hydrology.

The stored sediment would change bed elevation. In several locations, the increase in bed elevation relative to baseline would exceed one foot. This would occur in Reaches 8.7, 5, and 4.7 for the wet-year hydrology. Under the dry-year hydrology, this would occur in Reach 8.7 and Reach 4.7. Because these changes are very localized, these impacts would be less than significant. Flooding and changes in local bed geometry are discussed in WR-5 and WR-6 below.

MITIGATION

Under Alternative 3, this impact would not be significant and no mitigation would be required.

WR-4b: Increase in Frequency of High Suspended Sediment Concentrations

High flows will increase sediment concentration in the river and sediment management activities, such as sluicing, would further increase the suspended sediment concentration downstream of the Dam
Determination: ***significant and unavoidable, long-term***

IMPACT

In this Final EIR/EIS, Impact Issues WR-3a, WR-3b, WR-4a, and WR-4b cover sediment management operations after construction, including issues discussed in WR-2, WR-3 and WR-4 in the Draft EIR/EIS. Operational sediment management activities, such as sluicing do not apply to Alternatives 2, 3 and 4.

However, sediment would be trapped in the reservoir area under this alternative, but the downstream suspended sediment concentration would not experience the high sediment concentrations as often as Alternative 2. The limit of 500 ppm would be exceeded from 29 to 42 times under the wet-year hydrology and from 27 to 38 times in the dry-year hydrology (Table 4.2-8). These impacts would be significant and unavoidable.

MITIGATION

In the Draft EIR/EIS, long-term sediment management operational issues were identified as less than significant after mitigation and potentially beneficial. However, the additional studies performed to measure suspended sediment concentrations show that under Alternative 3, increases in frequency of high suspended sediment concentrations would be significant and unavoidable and could not be mitigated.

Table 4.2-8: Number of Days with Simulated Suspended Sediment Concentration within Defined Limits for Alternative 3

Wet-year Hydrology										
Concentration	**Reach**									
(ppm)	**R4.3**	**R4.7**	**R5**	**R6.3**	**R6.7**	**R7.3**	**R7.7**	**R8.3**	**R8.7**	**R9**
Less than 200	14,593	14,584	14,574	14,581	14,569	14,550	14,557	14,563	14,509	14,501
200-400	147	157	170	155	162	176	174	176	224	233
400-500	19	22	18	22	23	24	23	20	23	23
500-600	9	11	10	11	12	16	12	12	13	11
600-800	14	8	10	12	14	15	14	11	11	14
800-1000	5	5	4	5	4	3	4	3	4	3
1000-1200	3	2	3	3	3	3	2	2	4	3
1200-1400	1	2	2	2	2	2	3	3	1	2
1400-1600	0	0	0	0	2	2	2	1	2	1
1600-1800	0	0	0	0	0	0	0	0	0	0
1800-2000	1	1	0	0	0	0	0	0	0	0
>2000	0	0	1	1	1	1	1	1	1	1
Greater than 500	33	29	30	34	38	42	38	33	36	35
Dry-year Hydrology										
Concentration	**Reach**									
(ppm)	**R4.3**	**R4.7**	**R5**	**R6.3**	**R6.7**	**R7.3**	**R7.7**	**R8.3**	**R8.7**	**R9**
Less than 200	14,622	14,610	14,586	14,595	14,589	14,565	14,571	14,567	14,519	14,506
200-400	124	138	158	144	147	163	159	174	213	231
400-500	19	17	19	20	18	26	24	18	22	18
500-600	8	10	8	12	15	13	12	11	13	12
600-800	10	7	11	11	12	13	14	11	13	12
800-1000	3	4	3	3	2	3	3	4	3	4
1000-1200	4	4	4	3	3	3	4	3	5	5
1200-1400	0	1	2	2	3	3	2	1	1	1
1400-1600	1	0	0	1	2	2	2	2	2	2
1600-1800	0	0	0	0	0	0	0	0	0	0
1800-2000	1	1	0	0	0	0	0	0	0	0
>2000	0	0	1	1	1	1	1	1	1	1
Greater than 500	27	27	29	33	38	38	38	33	38	37

Note: Reach 4.3 is immediately below SCD. Reach 9 is at the lagoon. Simulation period is 41 years.

WR-5: Changes in Channel Bed Geometry

The additional sediment passing the Dam to the lower river would aggrade or degrade the river channel or change the channel cross section
Determination: ***less than significant, no mitigation is required, long-term***

IMPACT

The alternative would add 556 AF of sediment to the lower river, with 73 AF stored in the river in a wet-year. In a dry-year, it would add 576 AF to the lower river with 57 AF stored in the river. The additional sediment would add elevation to the channel bed or alter the channel cross section. Modeling results indicate that at several locations along the channel from the Dam to the ocean, the stored sediment would increase bed elevation relative to the baseline by over one foot. This would occur in Reaches 8.7, 5, and 4.7 for the wet-year hydrology. Under the dry-year hydrology, this would occur in Reach 8.7 and Reach 4.7. These changes would be localized and therefore would not impact an entire river reach. Additionally, changes to the channel bed geometry would not be large enough to adversely affect flood conditions in any reach of the river.

MITIGATION

The changes in bed elevation under this alternative are localized and do not extend throughout the river reach. These localized changes are not significant and would not result in a wide-scale change in the river geometry. No mitigation would be required. This is consistent with the Draft EIR/EIS text, where long-term sediment management operational issues upstream of the dam site were identified as less than significant after sediment excavation and design of geomorphically stable channels.

Alternative 4 (No Project)

Hydrology/Water Resources Issues WR-1, WR-2a, WR-2b, and WR-7 would not apply to the No Project Alternative because construction that creates these impacts would not occur and the water supply location would not be altered. Issues WR-4a, WR-5, WR-6 would be similar to those described for the Proponent's Proposed Project (however, benefits of implementing the SOMP would not occur).

Under the No Project Alternative, mitigation would not be provided beyond flows and other safeguards currently provided under the existing Interim Drawdown Memorandum of Understanding (MOU) and NMFS Conservation Agreement and any other current regulatory obligations.

Under the No Project Alternative, reservoir drawdowns as required by the Interim Seismic Safety Measures would continue annually until the reservoir fills with sediment. Since annual drawdowns typically occur during the low flow season, they would not affect high flows in the river. As the reservoir continues to fill with sediment, the water storage capacity in the reservoir would ultimately be negligible and would consist only of the remnant pool.

Alternative 4 and the Proponent's Proposed Project have a similar configuration of the Dam and therefore have similar influences on the sediment load for the 41-year simulation. However, the trap efficiency in the reservoir would be slightly higher in the near term under Alternative 4 because of the lack of sediment management. The modeling results for this alternative were previously discussed under the Proponent's Proposed Project and are described in the figures and tables as the Baseline Condition.

The simulated sediment stored in the reservoir under No Project is shown in Figure 4.2-22 and Figure 4.2-23 and would be the same as the discussion under the Proponent's Proposed Project.

The simulated sediment load passing SCD under No Project is shown in Figure 4.2-24 and would be the same as the discussion under the Proponent's Proposed Project.

The downstream sediment concentration under No Project is shown in Figure 4.2-17 through 4.2-19 and summarized in Table 4.2-5. The high sediment concentration would continue to occur during storm events.

Issue WR-3a: Change in Sediment Deposition in the Reservoir

Changes in the amount of sediment deposited in the reservoir upstream of SCD
Determination: ***less than significant, no mitigation available, long-term***

IMPACT

Sediment flowing into San Clemente Reservoir will fill the remaining capacity in six to ten years at the current rate. After filling, a remnant pool will remain, with the size of the pool a function of the recent storm pattern and magnitude of storms.

This filling process is a continuation of the current pattern of trapping the inflowing sediment. Alternative 4 does not change this pattern or alter the rate of filling. This impact is less than significant.

MITIGATION

No mitigation is available for this impact. The reservoir will continue to fill, leaving only the remnant pool.

WR-3b: Increased Sediment Deposition that Obstructs Fish Passage

During low-flow years, when all the flow is through the fish ladder, sediment would move close to the fish ladder, and possibly impair fish passage from the ladder to the remnant pool
Determination: ***significant, unavoidable, long-term***

IMPACT

Under Alternative 4, potential increases in sediment deposition that could obstruct upstream fish passage would be significant and unavoidable and would not be mitigated.

MITIGATION

No mitigation would be provided under the No Project alternative.

WR-4b: Increase in Frequency of High Suspended Sediment Concentrations

High flows will increase sediment concentration in the river and sediment management activities, such as sluicing, would further increase the suspended sediment concentration downstream of the Dam
Determination: ***less than significant, no mitigation required, long-term***

Operational sediment management activities, such as sluicing do not apply to Alternatives 2, 3, and 4. However, during high flow events, the sediment concentration in the lower river will increase. This increase is the same as would be experienced under existing conditions. Therefore, this impact is less than significant.

MITIGATION

No mitigation would be provided under the No Project alternative.

WR-8: Increased Risk of Dam Failure

Risk of dam failure due to seismic activity or flooding, leading to or increasing downstream flooding
Determination: ***significant and unavoidable, long-term***

IMPACT

Downstream reaches of the Carmel River would be impacted if SCD were to fail. In the case of a PMF and dam failure, the estimated peak flow of 81,000 cfs would overtop the channel and floodwaters would spread out onto the floodplain. WCC (1997a) estimated that floods 1 to 6 feet deep would occur on the floodplain at least 3 miles downstream of the Dam along subreaches 4.3, 4.7, and 5. Effects along the lowermost reaches (subreach 9) are unknown, but no flooding was reported in this area from previous flood events.

The sediment released due to dam failure would also impact the downstream reaches of the Carmel River. The 1,555 AF of sediment trapped in the reservoir would be subjected to suspension and subsequent transport. The quantity of sediment that would be transported following dam failure would depend on several factors, such as the duration and size of storm flows. Substantially more sediment would be released as a result of dam failure during a flood than would occur under in a dry weather dam failure (e.g., due to the MCE).

The volume of sediment would cause aggradation of the channel bed, likely raising the bed by more than one foot. This would impact the hydraulics of the channel and the capacity of the channel to hold flood waters.

The composition of sediment released during a dam failure would range from coarse sands and gravels to fine clays. Sediment would be deposited on the floodplain and along the downstream reaches near the mouth of the Carmel River.

Under the No Project Alternative, the flooding and sediment release impacts of a dam failure would be significant and unavoidable.

4.3 WATER QUALITY

This section describes the potential impacts of the San Clemente Seismic Safety Project on the water quality conditions of the Project Area. Water Quality resources includes mechanisms by which water quality would be potentially affected by the Proponent's Proposed Project and alternatives from both construction and operational activities influenced by the project. Additional information is provided in this Final EIR/EIS which clarifies and amplifies the information included in the Draft EIR/EIS. This environmental setting section was prepared using information developed from the documents provided by the Recirculated Draft Environmental Impact Report (Denise Duffy & Associates 2000), ENTRIX annual San Clemente Dam Drawdown reports (ENTRIX 2002, 2003b, 2004a, 2005, and 2006), and surface water quality monitoring reports (MPWMD 2003a MPWMD 2004). Water quality data and analyses are detailed in Appendix Q of this report. In addition, Appendices K and R contain the Stormwater Pollution and Prevention Plan (SWPPP) and the Spill Prevention, Containment and Countermeasure Plan (SPCC).

4.3.1 ENVIRONMENTAL SETTING

This section describes water quality conditions for each key location (upstream to downstream) at which project activities would take place. Only those parameters that would potentially be affected by the activities taking place during project construction and operations are discussed. The baseline environmental setting for purposes of impact comparison is defined through the year 2030. Water quality conditions that would be expected to change in this period are also described.

Water quality parameters are described using available data. Sources of existing water quality information in the Project Area include Monterey Peninsula Water Management District (MPWMD), surface water quality monitoring reports (MPWMD 2003a, MPWMD 2004), San Clemente Reservoir Drawdown monitoring reports (ENTRIX 2003b, ENTRIX 2004a, ENTRIX 2005a, ENTRIX 2006) and results from a surface water and porewater characterization project (ENTRIX 2002). A summary of available water quality data sources is provided in Table 4.3-1 and sampling locations for each source are depicted in Figure 4.3-1.

Carmel River and San Clemente Creek above San Clemente Reservoir

Three sources of water quality information are available for the Carmel River and San Clemente Creek above the reservoir. Water quality conditions in these reaches were measured daily for a minimum of five weeks in association with the 2004 through 2006 reservoir drawdown. The MPWMD has collected continuous surface water temperature data from both the Carmel River (since 1997) and San Clemente Creek (since 2003) above the reservoir (MPWMD 1998, MPWMD 2004). Additionally, pore water and surface water measurements were collected by ENTRIX (2002) to characterize conditions in the Carmel River and San Clemente Creek above the reservoir. The results of these studies show that for the period of monitoring, the water quality in these

portions of the Carmel River and San Clemente Creek was generally good and was not affected by drawdown activities.

Table 4.3-1: Summary of Sources and Water Quality Data Collected in San Clemente Reservoir and Vicinity

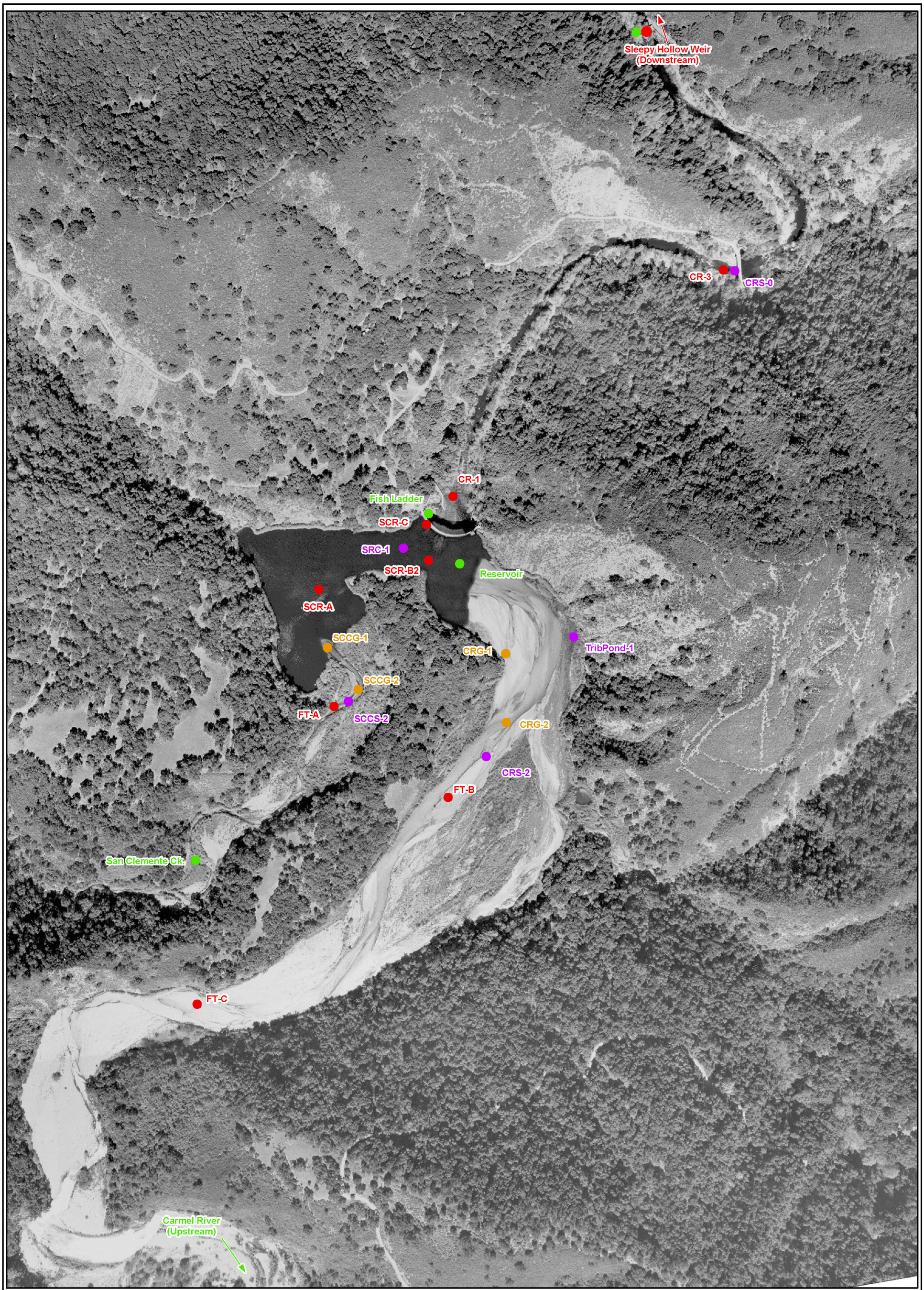
Source	Location	Parameter	Water Years	Months
MPWMD	Sleepy Hollow Weir	Temperature	1992 - 1996	Oct 1 - Sept 30
	Sleepy Hollow Weir	Dissolved Oxygen	1992 - 1996	Oct 1 - Sept 30
	Sleepy Hollow Weir	pH	1992 - 1996	Oct 1 - Sept 30
	Sleepy Hollow Weir	Specific Conductance	1992 - 1996	Oct 1 - Sept 30
	Sleepy Hollow Weir	Temp - Continuous	1996	April 30 - Sept 30
	San Clemente Reservoir Outlet	Temperature	1991 - 1996	Oct 1 - Sept 30
	Sleepy Hollow Weir	Temperature	1997 - 2003	Oct 1 - Sept 30
	Sleepy Hollow Weir	Dissolved Oxygen	1997 - 2003	Oct 1 - Sept 30
	Sleepy Hollow Weir	pH	1997 - 2003	Oct 1 - Sept 30
	Sleepy Hollow Weir	Specific Conductance	1997 - 2003	Oct 1 - Sept 30
	Sleepy Hollow Weir	Visual Turbidity	1997 - 2002	Oct 1 - Sept 30
	Sleepy Hollow Weir	Turbidity (NTU)	2003	Oct 1 - Sept 30
	Sleepy Hollow Weir	Temp - Continuous	1997 - 2003	Oct 1 - Sept 30
	San Clemente Fish Ladder	Temp - Continuous	1997, 1999 - 2003	
	San Clemente Reservoir Surface	Temp - Continuous	1997 - 2002	March - September
	San Clemente Reservoir Surface	Temp - Continuous	2003	October - November
	San Clemente Reservoir Bottom	Temp - Continuous	1998 - 2003	
	San Clemente Creek	Temp - Continuous	2003	May 28 - Sept 30
	Above San Clemente Reservoir	Temp - Continuous	1997 - 2003	Oct 1 - Sept 30
CAW-Drawdown	Reservoir - profile & continuous	Temperature	2003, 2004, 2005, 2006	spring, summer
	Reservoir - profile & continuous	Dissolved Oxygen	2003, 2004, 2005, 2006	spring, summer
	Reservoir - profile & continuous	pH	2003, 2004	summer
	Reservoir - profile & continuous	Specific Conductance	2003, 2004	summer
	Reservoir - profile & continuous	Turbidity (NTU)	2003, 2004, 2005, 2006	spring, summer
	Carmel R Below Dam	Suspended Sediment	2003	summer
	Carmel R Below Dam	Temperature	2003, 2004	summer
	Carmel R Below Dam	Dissolved Oxygen	2003, 2004	summer
	Carmel R Below Dam	pH	2003, 2004	summer
	Carmel R Below Dam	Specific Conductance	2003, 2004	summer
	Carmel R Below Dam	Turbidity (NTU)	2003, 2004	summer
	Carmel R Above Reservoir	Temperature	2004	summer
	Carmel R Above Reservoir	Dissolved Oxygen	2004	summer
	Carmel R Above Reservoir	pH	2004	summer
	Carmel R Above Reservoir	Specific Conductance	2004	summer
	Carmel R Above Reservoir	Turbidity (NTU)	2004	summer
	San Clemente Ck Above Reservoir	Temperature	2004	summer
	San Clemente Ck Above Reservoir	Dissolved Oxygen	2004	summer
	San Clemente Ck Above Reservoir	pH	2004	summer
	San Clemente Ck Above Reservoir	Specific Conductance	2004	summer
	San Clemente Ck Above Reservoir	Turbidity (NTU)	2004	summer
	Carmel R longitudinal profile	Temperature	2004	summer
	Carmel R longitudinal profile	Dissolved Oxygen	2004	summer
	Carmel R longitudinal profile	pH	2004	summer
	Carmel R longitudinal profile	Specific Conductance	2004	summer
	Carmel R longitudinal profile	Turbidity (NTU)	2004	summer

Table 4.3-1: Summary of Sources and Water Quality Data Collected in San Clemente Reservoir and Vicinity, continued

Source	Location	Parameter	Water Years	Months
ENTRIX 2002	Carmel R Above Reservoir	Metals	2002	11/1/02
Surface water	Carmel R Above Reservoir	Alkalinity	2002	11/1/02
	Carmel R Above Reservoir	pH	2002	11/1/02
	Carmel R Above Reservoir	Specific Conductivity	2002	11/1/02
	Carmel R Above Reservoir	Ions	2002	11/1/02
	San Clemente Ck Above Reservoir	Metals	2002	11/1/02
	San Clemente Ck Above Reservoir	Alkalinity	2002	11/1/02
	San Clemente Ck Above Reservoir	pH	2002	11/1/02
	San Clemente Ck Above Reservoir	Specific Conductivity	2002	11/1/02
	San Clemente Ck Above Reservoir	Ions	2002	11/1/02
	Reservoir	Metals	2002	11/1/02
	Reservoir	Alkalinity	2002	11/1/02
	Reservoir	pH	2002	11/1/02
	Reservoir	Specific Conductivity	2002	11/1/02
	Reservoir	Ions	2002	11/1/02
	Carmel R Below Dam	Metals	2002	11/1/02
	Carmel R Below Dam	Alkalinity	2002	11/1/02
	Carmel R Below Dam	pH	2002	11/1/02
	Carmel R Below Dam	Specific Conductivity	2002	11/1/02
	Carmel R Below Dam	Ions	2002	11/1/02
			2002	
ENTRIX 2002	Above Reservoir adjacent to River	Metals	2002	11/1/02
Pore water	Above Reservoir adjacent to River	Alkalinity	2002	11/1/02
	Above Reservoir adjacent to River	pH	2002	11/1/02
	Above Reservoir adjacent to River	Specific Conductivity	2002	11/1/02
	Above Reservoir adjacent to River	Ions	2002	11/1/02
	Above Reservoir on sand bar	Metals	2002	11/1/02
	Above Reservoir on sand bar	Alkalinity	2002	11/1/02
	Above Reservoir on sand bar	pH	2002	11/1/02
	Above Reservoir on sand bar	Specific Conductivity	2002	11/1/02
	Above Reservoir on sand bar	Ions	2002	11/1/02
	San Clemente Ck near Reservoir	Metals	2002	11/1/02
	San Clemente Ck near Reservoir	Alkalinity	2002	11/1/02
	San Clemente Ck near Reservoir	pH	2002	11/1/02
	San Clemente Ck near Reservoir	Specific Conductivity	2002	11/1/02
	San Clemente Ck near Reservoir	Ions	2002	11/1/02
	San Clemente Ck above Reservoir	Metals	2002	11/1/02
	San Clemente Ck above Reservoir	Alkalinity	2002	11/1/02
	San Clemente Ck above Reservoir	pH	2002	11/1/02
	San Clemente Ck above Reservoir	Specific Conductivity	2002	11/1/02
	San Clemente Ck above Reservoir	Ions	2002	11/1/02

Source: Monterey Peninsula Water Management District
ENTRIX 2002
ENTRIX 2003a
ENTRIX 2004a
ENTRIX 2005a
ENTRIX 2006

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Monitoring Station Type

- CAW Drawdown Monitoring Stations
- MPWMD Surface Monitoring Stations
- Surface Stations (2002 Surface and porewater Study)
- Porewater Stations (2002 Surface and porewater Study)

ENTRIX

2005 San Clemente EIR/EIS
California American Water Co.

Figure 4.3-1

Water Quality
Monitoring Stations

0 100 200
Feet

9/6/05
Projection: CA State Plane, Zone 4
Datum: NAD 83

E:\GIS\Entrix\3018603\map\Drawdown_WaterQualityMonitoring_03.mxd

During the 2003 to 2006 reservoir drawdowns, water quality data was collected from the reservoir and the Carmel River. The purpose of monitoring was to characterize water quality conditions for one week prior to drawdown, during drawdown, and one week post-drawdown. Conditions would vary seasonally and annually, depending on climate and rainfall. In 2003, baseline data (including dissolved oxygen [DO], turbidity, temperature, pH and conductivity) was collected for five days prior to drawdown. Monitoring continued throughout the drawdown operations and for about one week after the 515 feet reservoir elevation was reached. Water quality parameters were reduced during 2004 through 2006 because pH and conductivity did not provide any useful information to manage the drawdown. Turbidity, DO and temperature were collected in the reservoir in each year five days prior to the drawdown and were collected occasionally in the river downstream of the SCD.

Overall, pH measurements ranged from 7.1 to 8.1 throughout the monitoring period, thus demonstrating that pH was well within the established criteria of 5.8 to 9.0 (ENTRIX 2003b). Conductivity values ranged from 0.231 to 0.301 mS/cm, with a slight increasing trend observed during the monitoring period. The conductivity values observed are not uncommonly high or low (ENTRIX 2003a).

DO, turbidity and temperature were the water quality parameters of greatest concern in the reservoir and river during the summer drawdowns. A summary of the 2003 to 2006 DO, turbidity, and temperature data is provided below in Tables 4.3-2 to 4.3-4.

Table 4.3-2: Water Quality Summary at Station SCR-A during 2003-2006 Drawdowns

	2003	2004	2005	2006
DISSOLVED OXYGEN (mg/l)				
Baseline	6.3-8.3	7.8-9.0	2.8-8.5	6.0-8.4
Drawdown	2.4-8.0	3.5-9.4	2.4-8.4	1.7-8.8
Post-Drawdown	3.8-7.8	3.6-6.8	4.1-8.3	2.9-7.9
TURBIDITY (NTUs)				
Baseline	1.9-4.0	0.0-2.3	0.0-3.7	NA
Drawdown	1.7-35.7	0.0-15.8	0.0-7.5	5.7-14.0
Post-Drawdown	12.7-28.4	9.6-17.7	5.2-11.0	8.5-16.0
TEMPERATURE (°C)				
Baseline	16.3-17.5	16.1-18.2	18.4-22.7	18.1-20.2
Drawdown	16.2-24.9	16.2-22.2	19.4-24.1	17.9-26.6
Post-Drawdown	16.3-24.9	18.0-21.3	18.5-22.3	19.4-24.4

Table 4.3-3: Water Quality Summary at Station SCR-B during 2003-2006 Drawdowns

	2003	2004	2005	2006
DISSOLVED OXYGEN (mg/l)				
Baseline	7.2-7.9	8.2-8.8	4.8-8.2	6.6-8.2
Drawdown	4.7-8.0	3.0-9.8	4.3-10.8	3.1-8.5
Post-Drawdown	5.8-7.0	5.0-7.3	4.0-7.2	5.2-6.8
TURBIDITY (NTUs)				
Baseline	2.1-2.6	0.0-0.8	0.1-3.7	NA
Drawdown	2.3-25.9	0.0-16.8	0.0-6.6	5.6-11.4
Post-Drawdown	15.0-25.3	9.3-12.9	5.4-11.7	8.1-14.1
TEMPERATURE (ºC)				
Baseline	16.5-17.9	16.2-18.2	18.4-21.6	18.1-20.4
Drawdown	16.2-21.8	16.1-20.0	19.2-23.6	17.8-25.3
Post-Drawdown	20.1-21.9	17.5-21.0	17.9-20.3	18.7-22.9

Table 4.3-4: Water Quality Summary at Station SCR-C during 2003-2006 Drawdowns

	2003	2004	2005	2006
DISSOLVED OXYGEN (mg/l)				
Baseline	6.8-8.5	7.1-8.3	5.6-8.4	5.4-7.8
Drawdown	4.4-8.0	4.8-8.7	5.0-8.4	2.7-7.8
Post-Drawdown	5.7-6.5	4.2-6.4	5.0-5.6	4.1-6.1
TURBIDITY (NTUs)				
Baseline	0-2	0-2	0-1	1-10
Drawdown	0-38	0-14	0-18	2-19
Post-Drawdown	13-38	8-19	5-16	16-39
TEMPERATURE (ºC)				
Baseline	16.2-17.4	15.6-16.8	18.5-20.0	17.9-19.1
Drawdown	16.1-21.0	15.4-19.8	18.8-21.7	17.5-24.7
Post-Drawdown	20.1-22.0	18.1-20.8	18.2-20.6	18.8-22.9

In the Carmel River, dissolved oxygen concentrations ranged from approximately 8.0 mg/L to 10.0 mg/L. (Figure 4.3-2). Turbidity was very low, ranging from 0 to 3.5 Nephelometric Turbidity Units (NTUs). Water temperatures ranged from 13 ºC to 18 ºC in the morning and 17 ºC to 22 ºC in the afternoon.

In San Clemente Creek, dissolved oxygen concentrations ranged from 7.0 mg/L to 10.0 mg/L (Figure 4.3-3). Generally, turbidity was low, averaging 0 to 3 NTUs, with two brief spikes of 4.3 and 8.7 NTUs. Water temperatures ranged from 11 ºC to 16 ºC in the morning and 14 °C to 18 ºC in the afternoon.

The MPWMD has recorded instream water temperature in the Carmel River since water year (WY) 1997 and in San Clemente Creek during summer and fall of 2003 (MPWMD 2004). The MPWMD deploys continuous monitoring probes in April or May, depending on runoff conditions, and retrieves the probes in November. Average temperatures recorded for the Carmel River were about 14 ºC in April, with a diurnal variation of 4 ºC to 6 ºC). Daily temperatures increased until early August, when average temperatures

were about 21 ºC and maximum temperature was about 25 ºC. Temperatures then begin decreasing until November when the minimum temperature reaches about 10 ºC.

The period of record for water temperature in San Clemente Creek is too short to determine general patterns and temperature ranges. Appendix Q shows the data collected on San Clemente Creek from May 28 to September 30, 2003. During this period the daily average water temperature ranged from 14 °C to 18 ºC, with a diurnal variation of 4 ºC to 6 ºC.

A characterization of surface and pore water chemistry in the Carmel River and San Clemente Creek) was conducted by ENTRIX in 2002 to evaluate potential water quality effects associated with water level drawdown in San Clemente Reservoir. Sampling locations are shown in Figure 4.3-1. Chemical analyses included metals, hardness, total dissolved solids, pH, specific conductivity, and ionic chemistry.

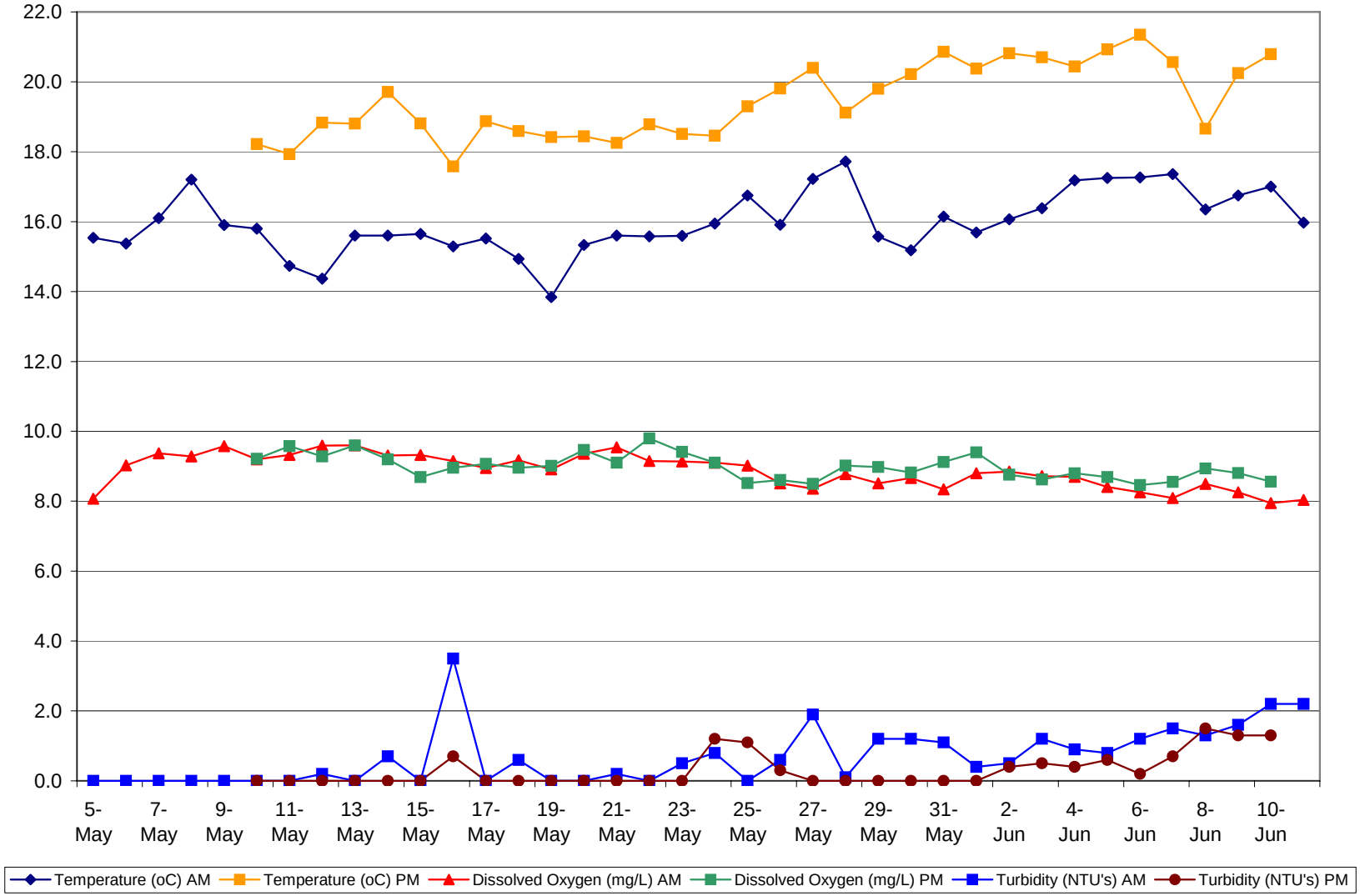
The majority of results for metals were non-detected at the laboratory's reporting limits. All detected metals results were well below the established water quality criteria for both aquatic life and human health protection. The hardness results (96 to150 mg/L) indicate a good buffering capacity against changes in both pH and metals concentrations.

The results of the ionic chemistry analyses were below established water quality criteria for surface waters, with the exception of sodium (Na) concentrations (20 mg/L maximum from Central Coast Basin Plan) in San Clemente Creek (25 mg/L), and the tributary pond (99 mg/L). Most porewater analysis results were also below the criteria, except for iron (1.0 mg/L, EPA), which ranged from 4.4 mg/L to 12 mg/L.

San Clemente Reservoir

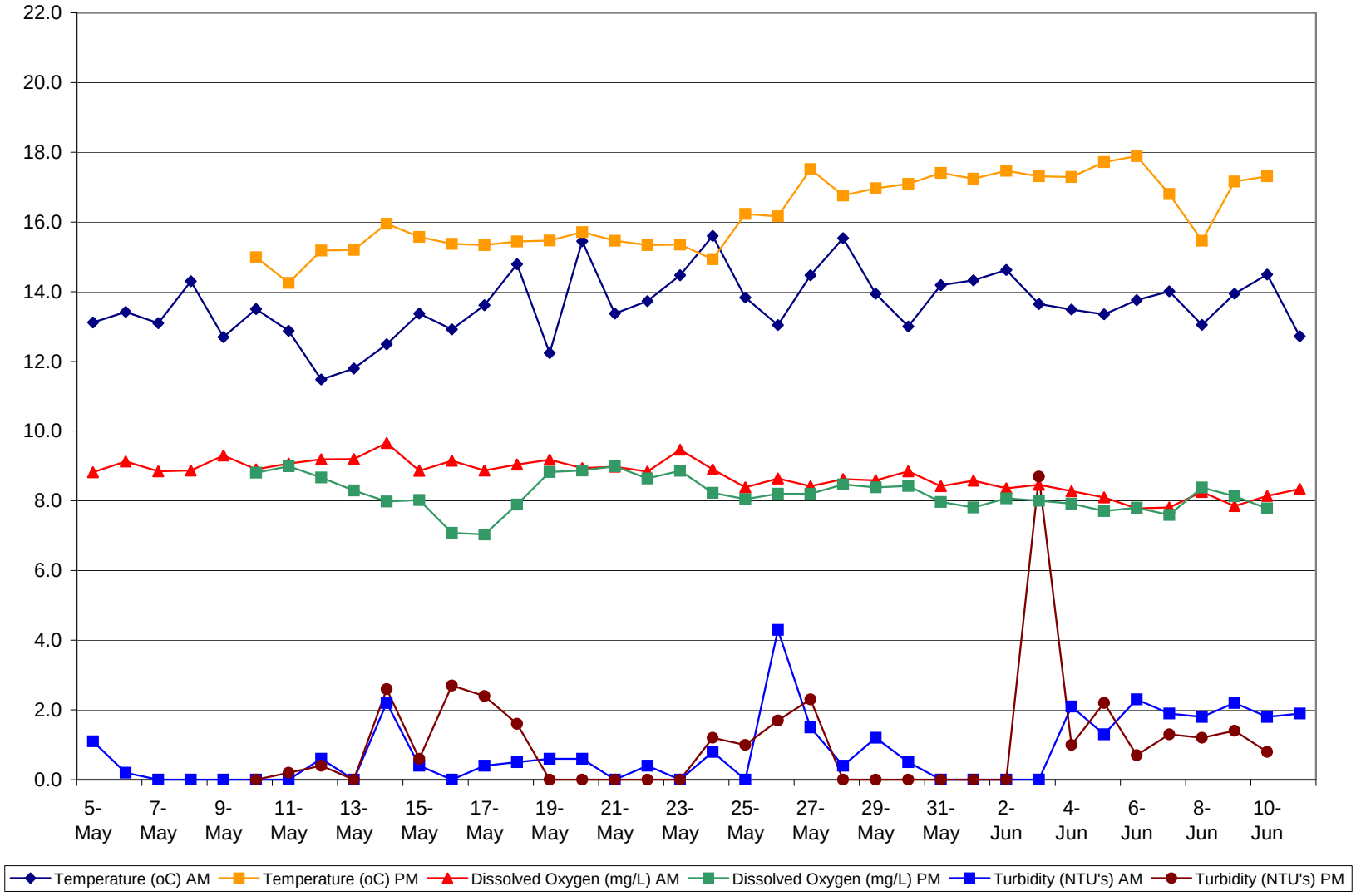
Three sources of water quality data are available for San Clemente Reservoir, which are derived from both long-term and short-term monitoring programs (Table 4.3-1). Fixed station measurements of dissolved oxygen, turbidity, temperature, pH and specific conductivity were monitored during the 2003 drawdown. During the 2004 through 2006 drawdowns, dissolved oxygen, turbidity and temperature were monitored. Additional reservoir monitoring during the 2003 drawdown included hydrogen sulfide. The MPWMD has also monitored reservoir surface water temperatures from 1997 through 2003 and bottom water temperatures from 1998 through 2003. A water chemistry analysis of reservoir water was performed by ENTRIX in 2002 to establish baseline conditions.

Figure 4.3-2: 2004 Carmel River Water Quality above San Clemente Reservoir



Source: ENTRIX 2004a

Figure 4.3-3: 2004 San Clemente Creek Water Quality above San Clemente Reservoir



Source: ENTRIX 2004a

A summary of the water quality information from these sources relevant to potential project activities and actions is presented below.

DISSOLVED OXYGEN

Diurnal dissolved oxygen concentrations were available for San Clemente Reservoir during the 2003 drawdown (June 23 to July 26) (Figure 4.3-4) (See also Appendix Q-4). Daily minimum and maximum dissolved oxygen concentrations were available for the 2004 drawdown (May 10 to June 3), the 2005 drawdown (July 25 to August 15) (Appendix Q, Figures 4.3-5 and 4.3-6), and the 2006 drawdown (July 3 to July 27) (Figure 4.3-7). Note that the drawdown rate during 2004 to 2006 was much slower (about 0.5 ft/day) than during the first part of the 2003 drawdown (about 2 ft/day). This would be one of the main factors that accounts for the difference between water quality conditions during 2003 compared to the other drawdown events.

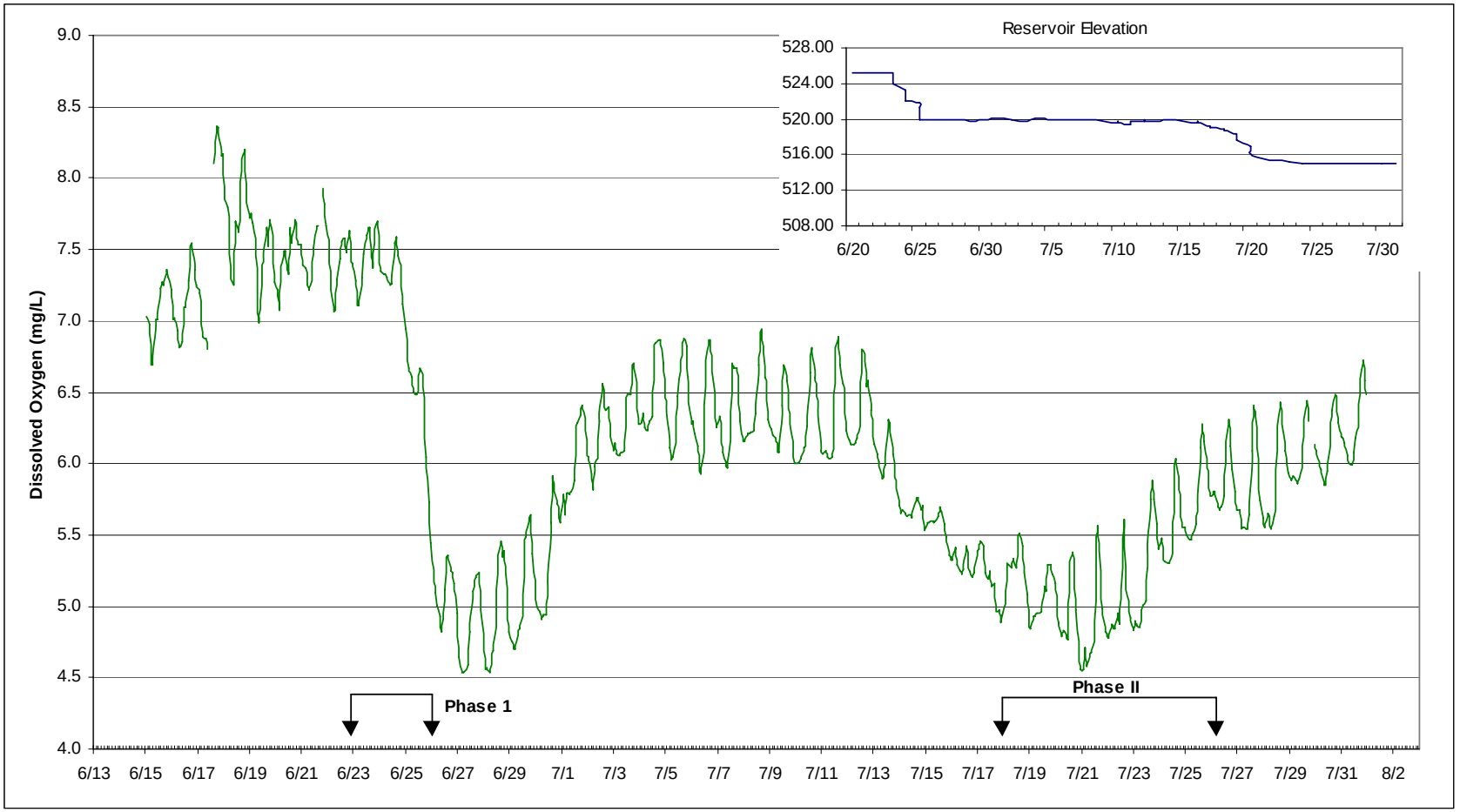
During the six days prior to the 2003 drawdown (baseline condition) dissolved oxygen concentration ranged from 6.6 mg/L to 8.4 mg/L and averaged 7.1 mg/L. During the periods when drawdown occurred, dissolved oxygen values ranged from 4.5 mg/L to 6.3 mg/L and averaged about 5.3 mg/L). Following the drawdown, dissolved oxygen partially recovered over a 3-5 day period with values ranging from 5.5 mg/L to 7.0 mg/L and averaging 6.3 mg/L.

During the five days prior to the 2004 drawdown (baseline condition) dissolved oxygen values ranged from 7.0 mg/L to 8.3 mg/L and averaged 7.6 mg/L. During the drawdown, dissolved oxygen values ranged from 4.8 mg/L to 8.7 mg/L and averaged 6.5 mg/L. For seven days following the drawdown, dissolved oxygen continued to decline for the first 2 days and then appeared to start increasing, with values ranging from 4.5 mg/L to 6.5 mg/L and averaging about 5.2 mg/L.

During the week prior to the 2005 drawdown (baseline condition) dissolved oxygen values ranged from 5.6 mg/L to 8.4 mg/L and averaged 7.0 mg/L. During the drawdown, DO values ranged from 5.0 mg/L to 7.9 mg/L and averaged 6.0 mg/L. Similar values were observed for about two weeks following the drawdown. Dissolved oxygen concentrations then began to increase with values averaging 7.5 mg/L by mid-September.

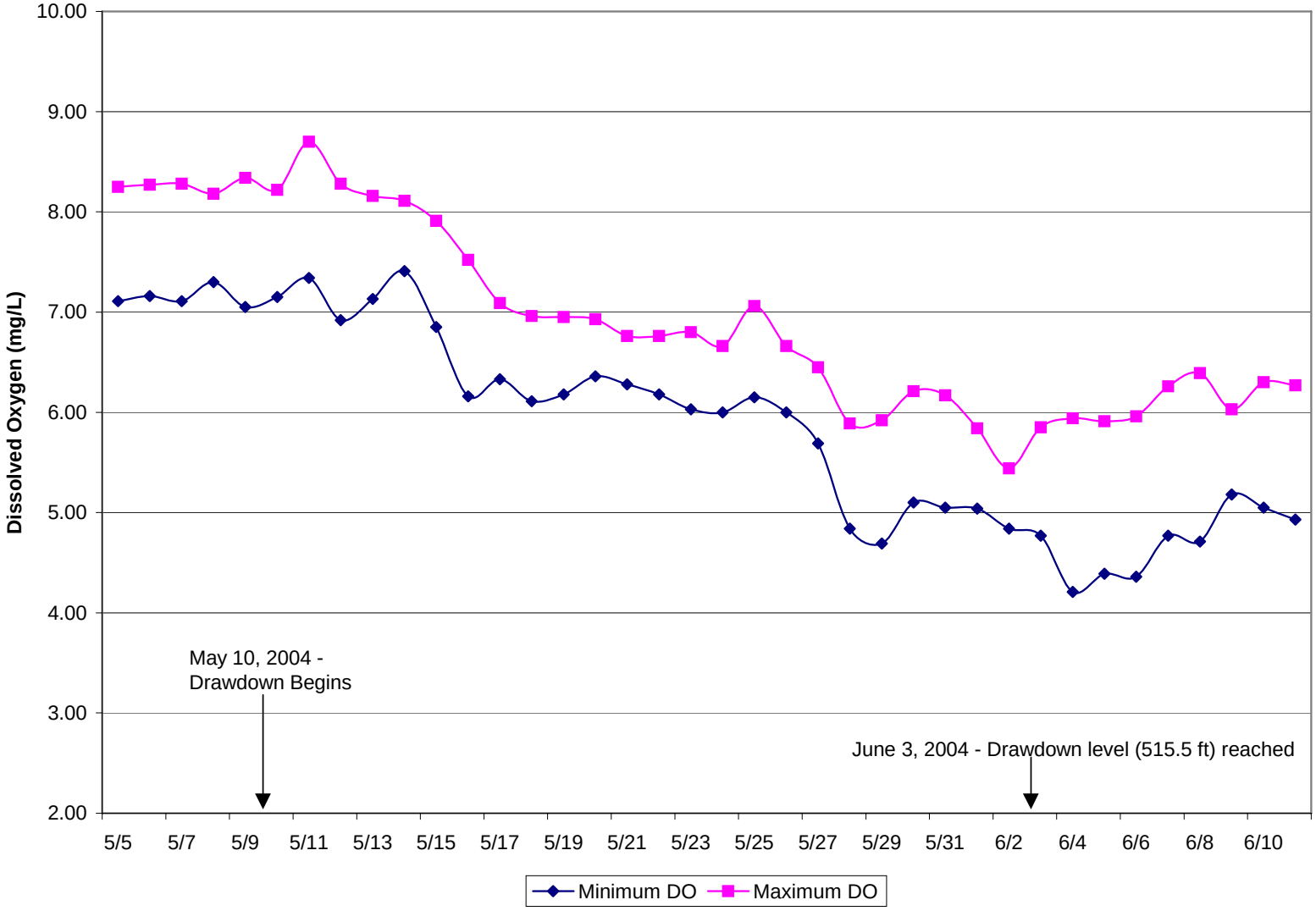
In 2006, DO concentrations were higher prior to the drawdown with a decreasing trend following the start of the drawdown and then increasing towards the end of the drawdown operations (Figure 4.3-7). Throughout the drawdown period (July 3 to August 8), morning concentrations ranged from 3.3 to 8.4 mg/L at the surface and 4.6 to 9.3 mg/L at the 10-foot depth. Afternoon concentrations ranged from 4.0 to 8.8 mg/L at the surface and 2.6 to 7.9 mg/L at the 10-foot depth. Supersaturated DO concentrations (values > 8.6 mg/L) were recorded at the surface in the afternoon (July 3 and July 6). These supersaturated concentrations are attributed to the photosynthetic activity of algae in the late afternoon.

Figure 4.3-4: 2003 Reservoir Dissolved Oxygen Concentration during Drawdown



Source: Entrix 2003a

Figure 4.3-5: 2004 Reservoir Dissolved Oxygen Concentration during Drawdown



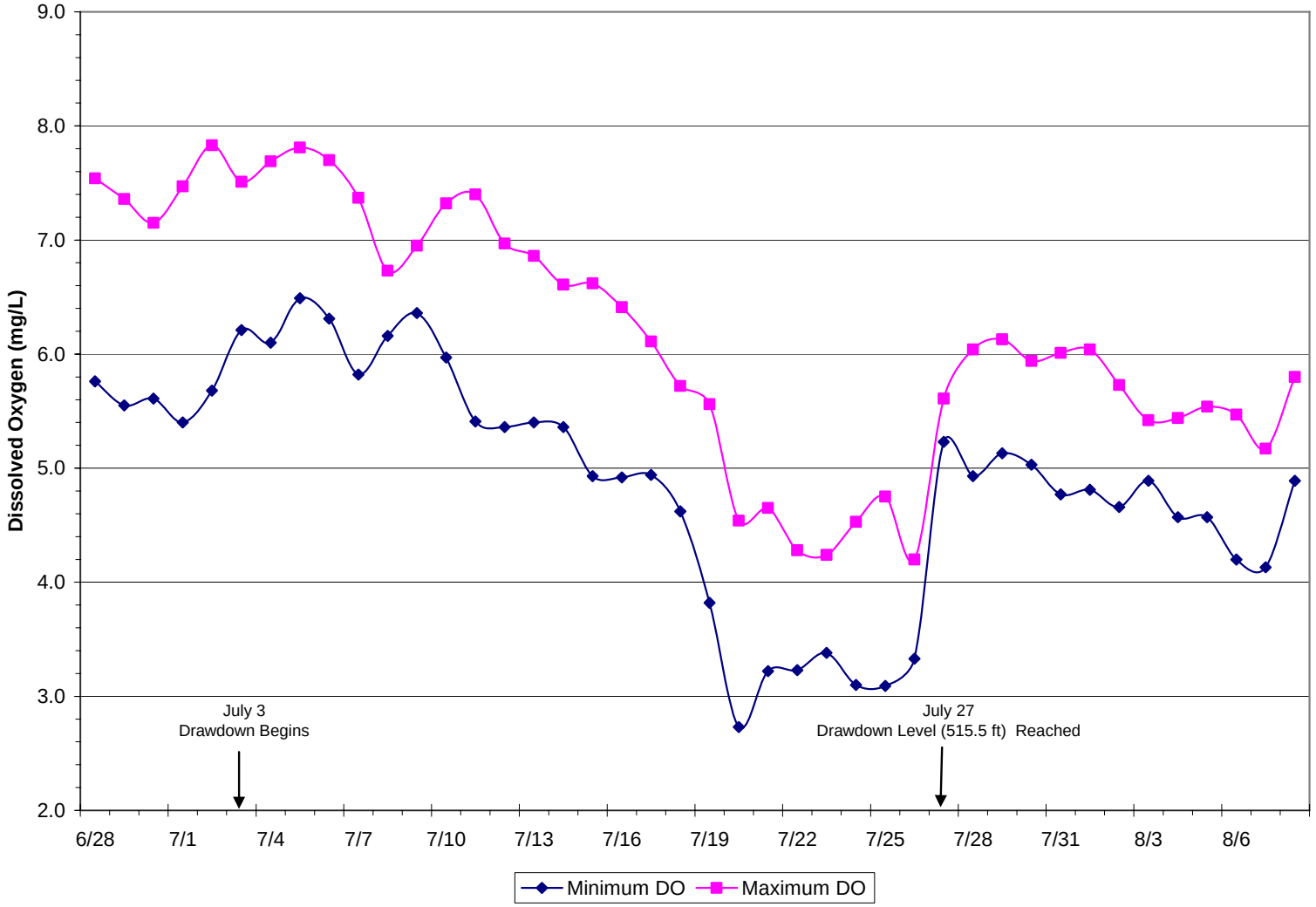
Source: ENTRIX 2004a

Figure 4.3-6: 2005 Reservoir Dissolved Oxygen during Drawdown



Source: Entrix 2005a

Figure 4.3-7: 2006 Reservoir Dissolved Oxygen during Drawdown



Source: Entrix 2006

TURBIDITY

Diurnal turbidity was available for the 2003 drawdown and daily minimum and maximum values were available for the 2004 through 2006 drawdowns (Appendix Q). For six days prior to the 2003 drawdown (baseline condition), turbidity ranged from 0 to 1 NTUs. During the drawdown, turbidity rapidly increased, with a range of 8 to 34 NTUs. For six days following the drawdown, turbidity ranged from 14 to 19 NTUs and appeared to be gradually decreasing (Figure 4.3-8). Monitoring conducted beyond the 2003 drawdown during winter 2003/2004 showed that turbidity gradually declined after the drawdown period and reached a range of 0 to 1 NTUs in the second week of January 2004. Note that turbidity levels during 2003 were much higher than during 2004 or 2005. Turbidity remained around 0 to 1 NTUs during winter, except for very brief periods (two to four days) following large rainstorms. During storm runoff events turbidity was observed to increase and decrease very abruptly. During the winter 2003/2004 monitoring period there were five storm-related turbidity peaks ranging from 68 NTUs to 578 NTUs that were associated with flows ranging from 462 cfs to 2,060 cfs. Between storm events turbidity was generally less than 1 NTU.

For five days prior to the 2004 drawdown (baseline condition), turbidity in the reservoir was 0 NTU, except for one very brief spike of 2 NTUs. Turbidity generally increased during the drawdown period, with a range of 0 to 14 NTUs (Figure 4.3-9). For seven days following the drawdown, turbidity continued to increase, with values ranging from 8 to 19 NTUs.

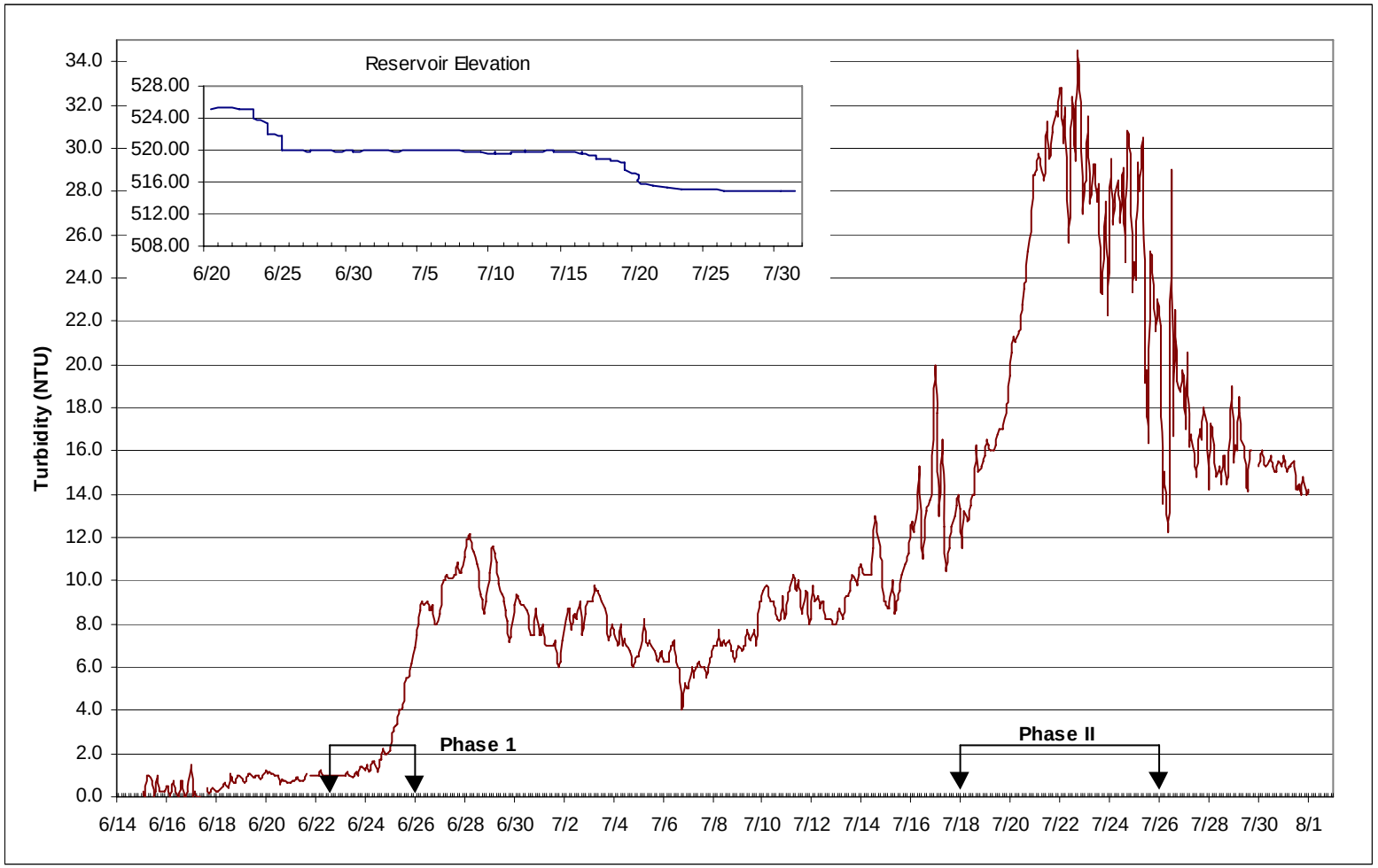
During the week prior to the 2005 drawdown, turbidity in the reservoir was 0 NTU. Turbidity quickly increased during the drawdown period, with a range of 1 to 19 NTUs (Figure 4.3-10). Following the drawdown, turbidity varied widely between 4 to 18 NTUs and did not show any overall trends.

In 2006 there was a gradual increase in turbidity as the drawdown progressed (1 to 19 NTUs) (Figure 4.3-11), followed by a large spike (18 NTUs) two weeks prior to reaching the target elevation of 515.5 feet. Turbidity values one week prior to the drawdown (June 28 to July 3) were the lowest. Turbidity values at SCR-C were higher towards the conclusion of the drawdown due to organic debris building up in this section of the reservoir (no inflow influence from Carmel River); therefore, turbidity values were much higher (> 20 NTUs) than the 2005 drawdown event.

TEMPERATURE

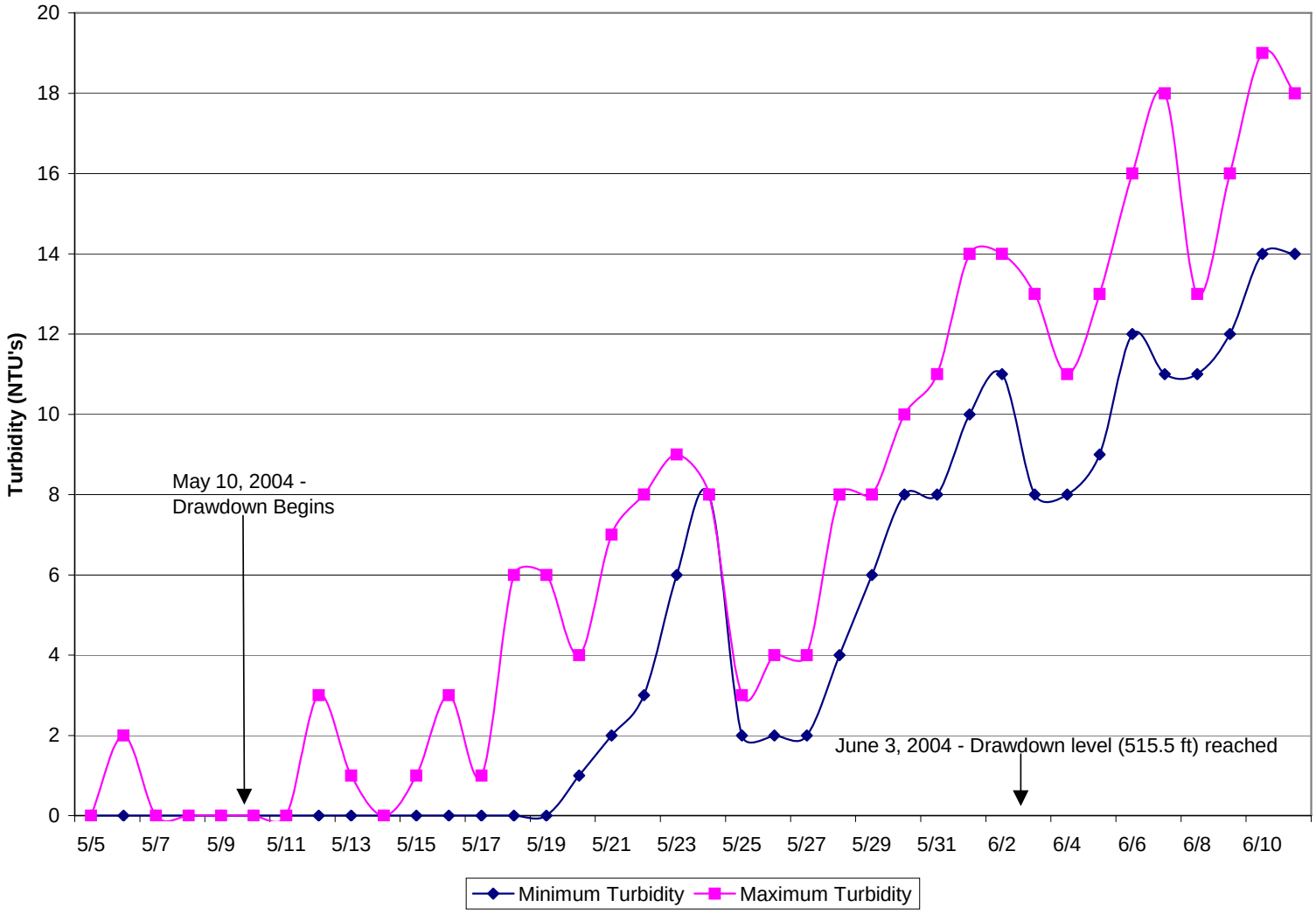
Water temperatures in San Clemente Reservoir were available for the 2003, 2004, 2005, and 2006 drawdowns as well as from the MPWMD's long-term data set and are summarized below (Figures 4.3-12 to 4.3-15) and in Appendix Q.

Figure 4.3-8: 2003 Reservoir Turbidity during Drawdown



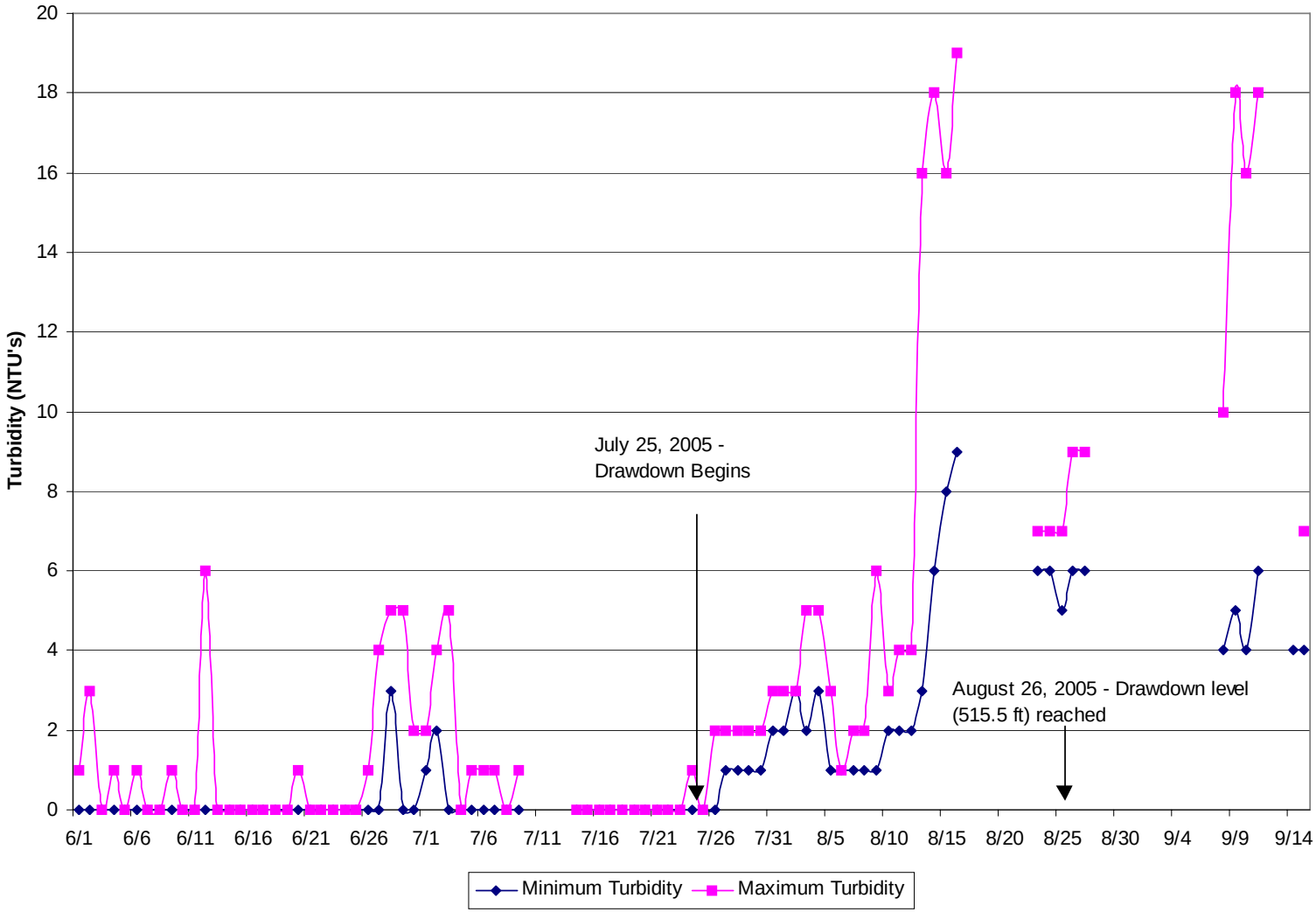
Source: Entrix 2003a

Figure 4.3-9: 2004 Reservoir Turbidity during Drawdown



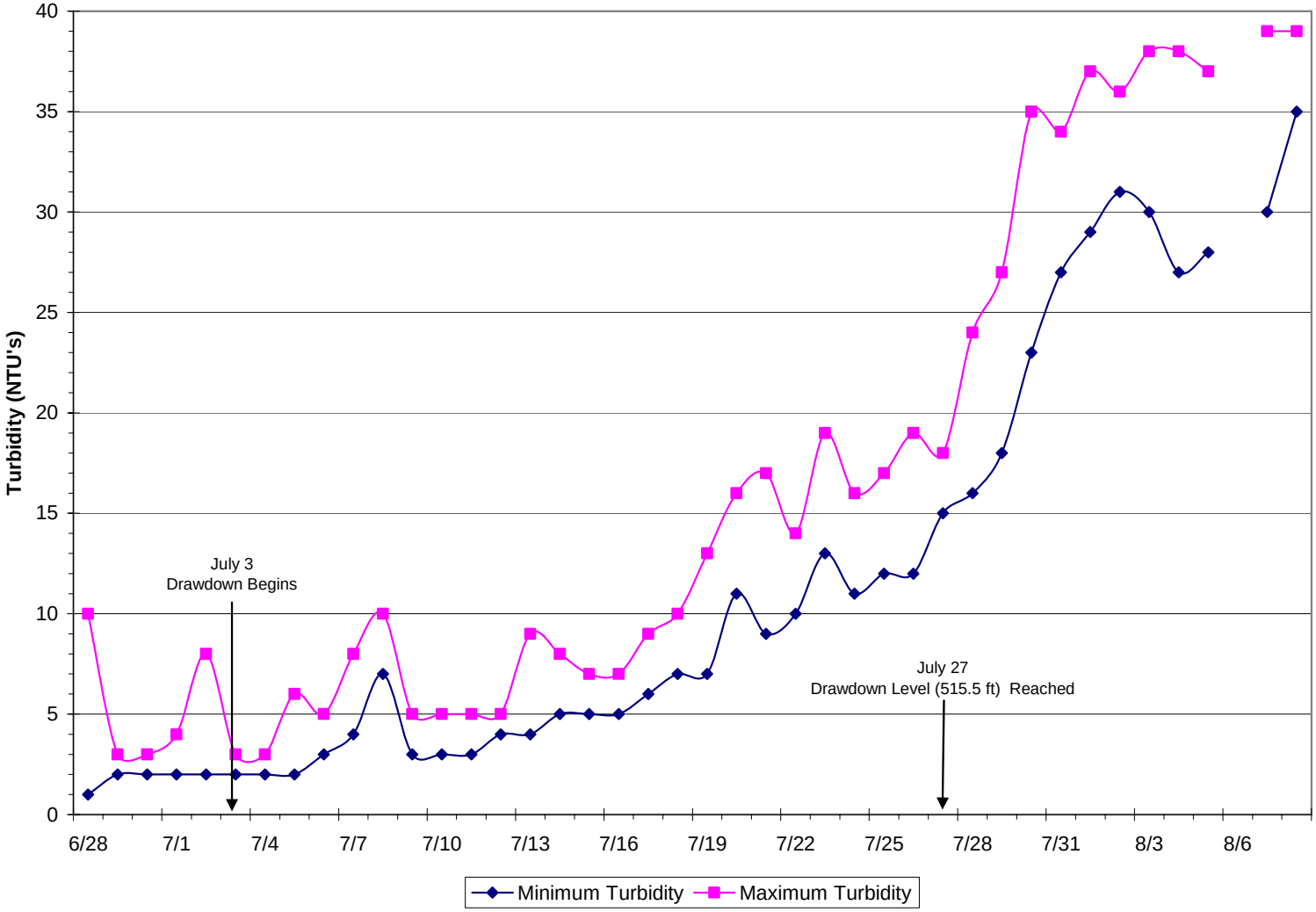
Source: ENTRIX 2004a

Figure 4.3-10: 2005 Reservoir Turbidity during Drawdown



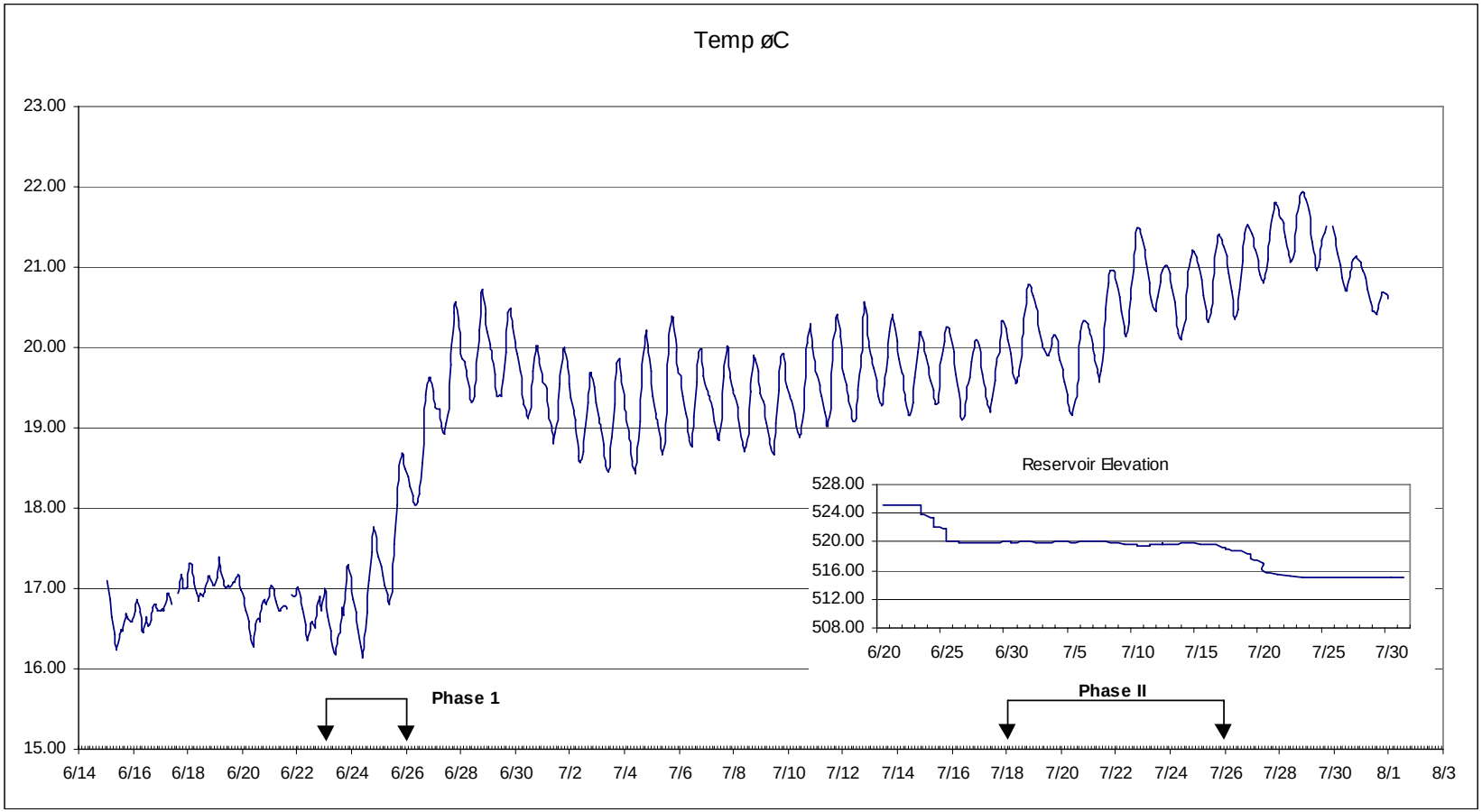
Source: Entrix 2005a

Figure 4.3-11: 2006 Reservoir Turbidity during Drawdown



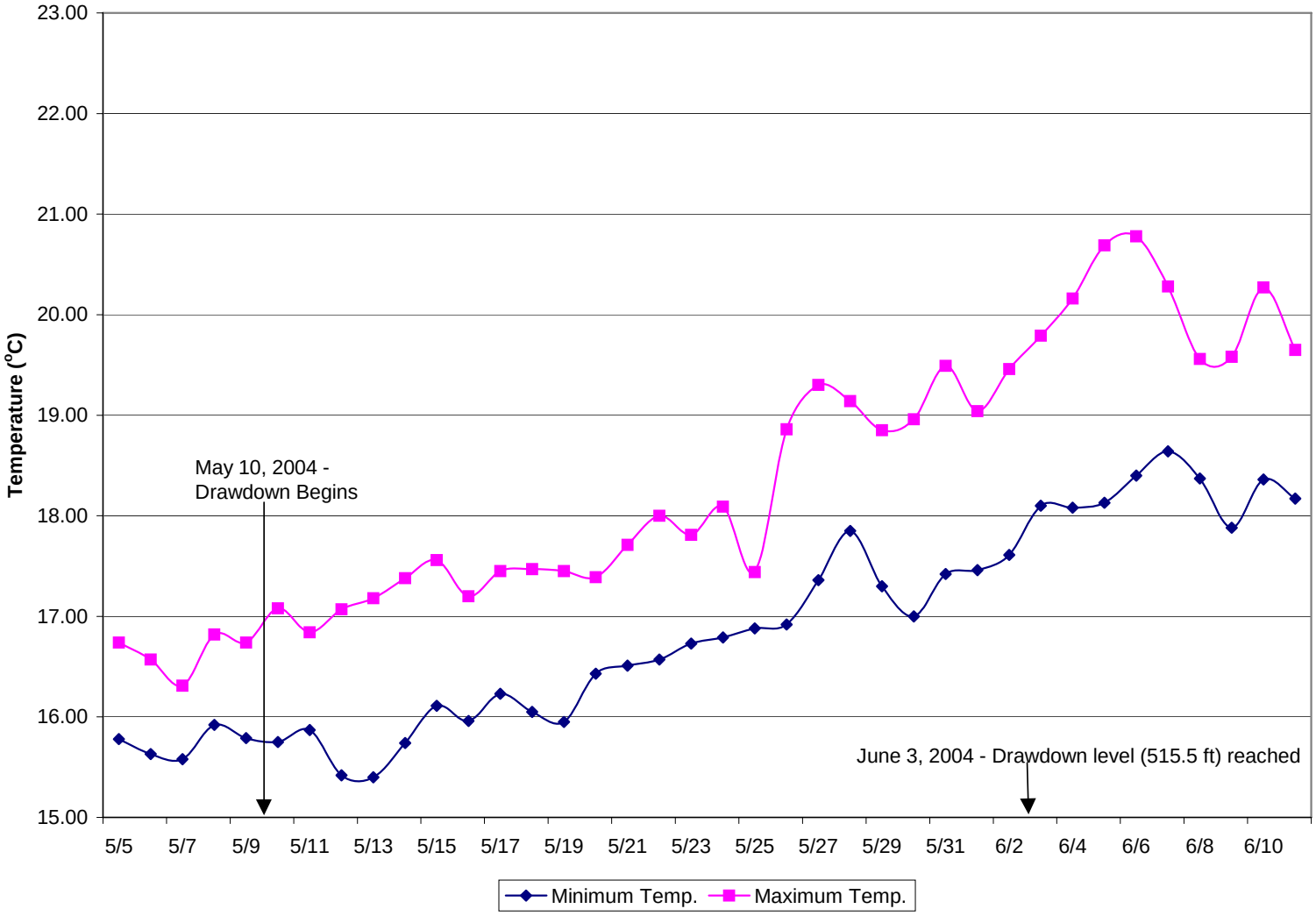
Source: Entrix 2006

Figure 4.3-12: 2003 Reservoir Temperature during Drawdown



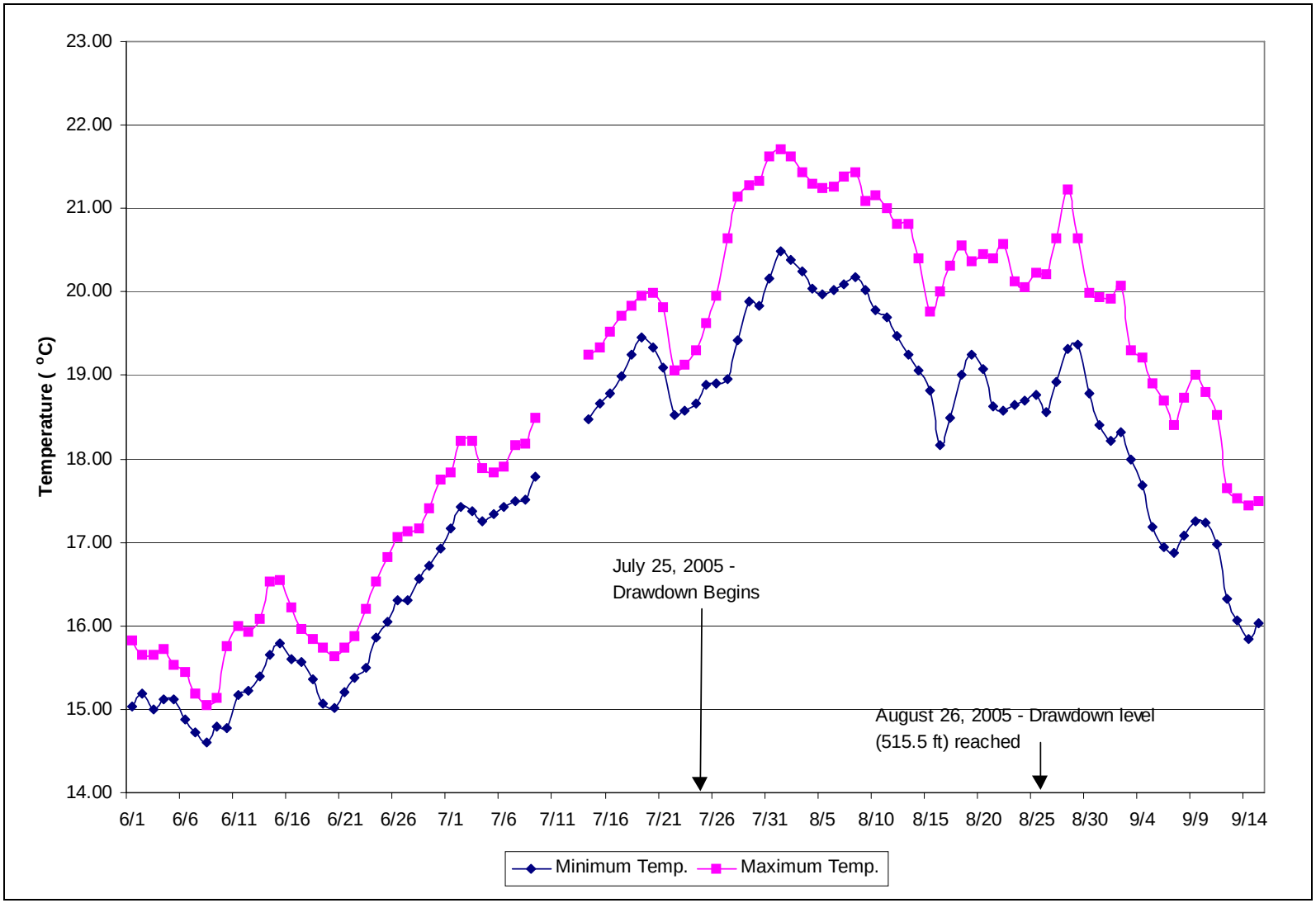
Source: Entrix 2003b

Figure 4.3-13: 2004 Reservoir Temperature during Drawdown



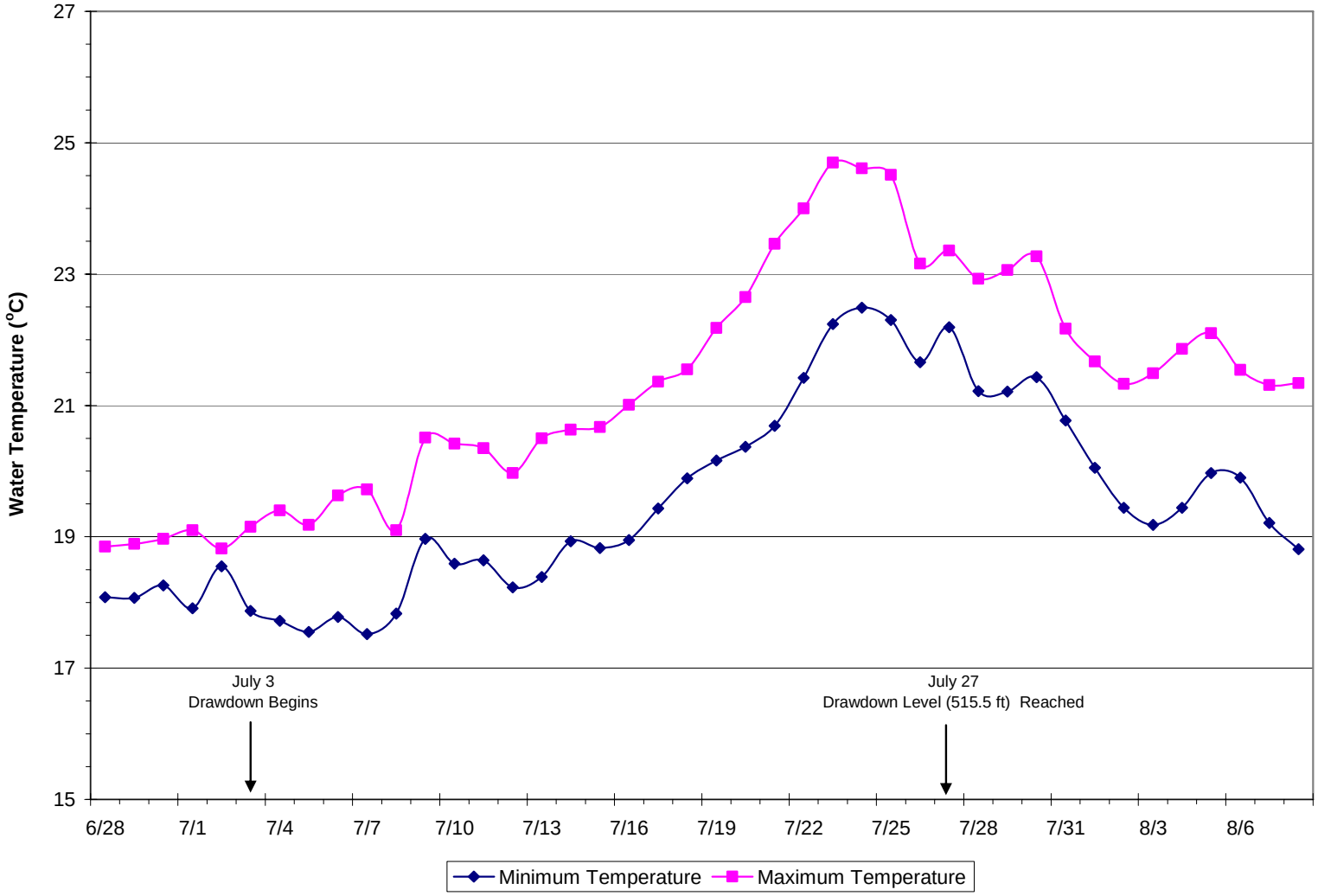
Source: ENTRIX 2004a

Figure 4.3-14: 2005 Reservoir Temperature during Drawdown



Source: Entrix 2005a

Figure 4.3-15: 2006 Reservoir Temperature during Drawdown



Source: Entrix 2006

During the six days prior to the 2003 drawdown, water temperatures ranged from 16.3 ºC to 17.4 ºC. Water temperatures increased rapidly during the two days immediately following the first phase of the drawdown, coinciding with sharp increases in ambient air temperature, with a range of 18.5 ºC to 20.7 ºC (Figure 4.3-12). Water temperature continued to increase during and after the second phase of the drawdown, with values ranging from 19.2 ºC to 22.0 ºC.

During the five days prior to the 2004 drawdown, water temperatures ranged from 15.5 ºC to 16.8 ºC. Water temperatures gradually increased during and after the drawdown period, with values ranging from 15.5 ºC to 20.8 ºC (Figure 4.3-13). It is likely that differences between the 2003 and 2004 water temperatures are largely due to differences in ambient air temperatures.

During the week prior to the 2005 drawdown, water temperatures in the reservoir ranged from 18.5 ºC to 20 ºC. Figure 4.3-14 shows that reservoir temperatures appear to reflect a naturally increasing trend during summer. During the drawdown, water temperatures increased to a maximum of about 21.5 ºC, and then began to gradually decrease, with minimum temperatures reaching 16 ºC by mid September.

The temperature trend observed during the 2006 drawdown indicated a gradual increase in temperature followed by a gradual decrease for the last two weeks of the monitoring period. Prior to the drawdown, temperature ranged from 17.9 °C to 20.4°C. During the drawdown process (including prior to the drawdown commencing) temperatures gradually increased and then began to decrease, with minimum temperatures ranging from 17.5 °C to 22.5°C and maximum temperatures ranging from 19.1 °C to 26.6°C (Figure 4.3-15).

Since WY 1997, the MPWMD has recorded surface water temperature in San Clemente Reservoir during spring, summer, and fall (MPWMD 2004). A continuous recording temperature probe is deployed starting in April or May (depending on runoff conditions) and retrieved in about mid to late November in most years. Minimum, maximum and average water temperatures are graphed by water year for the recorded data set. A consistent seasonal pattern of increasing and decreasing water temperature occurs in the reservoir (Appendix Q). From spring (April to May) through summer (early August), surface water temperature steadily increases from about 13 ºC to 22 ºC. A relatively gradual decrease in surface water temperature to about 18 ºC in August and September is followed by a more rapid decrease to about 10 ºC by late November/early December.

Since WY 1998, the MPWMD has also recorded bottom water temperature in the San Clemente Reservoir during spring, summer and fall. A continuous recording temperature probe is deployed on the bottom on the same schedule as the surface probe. The same seasonal pattern of increasing and decreasing water temperatures observed at the reservoir surface also occurs at the bottom. However, there is generally less daily variation in temperature and maximum values are slightly lower. From spring (April to May) through summer (early August) bottom water temperature steadily

increases from about 11 ºC to 20 ºC. A gradual decrease to about 17 ºC occurs in August, followed by a rapid decrease to about 10 ºC in late November.

HYDROGEN SULFIDE

The potential occurrence of hydrogen sulfide accumulation in the reservoir was a concern for the 2003 drawdown of the San Clemente Reservoir. Prior chemical analysis of porewater from the Carmel River and San Clemente Creek stream channels indicated the presence of sulfate. Sulfate is reduced to hydrogen sulfide under anaerobic conditions such as occur in the porewater. Under drawdown conditions, porewater from the streambeds is released into the reservoir as the water level is lowered.

During the 2003 drawdown, hydrogen sulfide tests were conducted at several stations within the reservoir to determine if hydrogen sulfide levels would pose a risk to fish survival in the reservoir. Hydrogen sulfide tests on water samples collected from the middle water column at stations about 50 to 200 feet from the two stream mouths did not detect any hydrogen sulfide (ENTRIX 2003b). Hydrogen sulfide was detected in about 21 percent of samples collected from stations located on each side of the Carmel River and San Clemente Creek and from the bottom of the water column near the sediment fronts. The hydrogen sulfide concentrations were barely detectable, ranging from <0.1 to 0.2 mg/L, well below the project threshold of 0.5 mg/L.

OTHER PARAMETERS

Specific conductance and pH were monitored and reported during the 2003 drawdown period (ENTRIX 2003b). Specific conductance values ranged from 0.231 to 0.301 mS/cm, with a fairly constant, but minor increase during the monitoring period. The pH levels ranged from 7.1 to 8.1 throughout the monitoring period, well within the aquatic life criterion of 5.8 to 9.0. An evaluation of the drawdown results indicated that the response of specific conductance and pH during the drawdown was negligible and consequently it was decided that they would not be reported during the 2004 drawdown. No further evaluation of specific conductance or pH is made in this report.

2002 WATER CHEMISTRY ANALYSIS

A surface water sample was collected by ENTRIX from San Clemente Reservoir in 2002 and analyzed by a certified laboratory for metals, alkalinity, hardness, total dissolved solids, and general ionic chemistry, Except for barium, all metals results were below laboratory detection limits. The barium concentration (41 ug/L) was well below all maximum criteria for the protection of aquatic and human health. All other measured parameters were well within normal concentrations. (Appendix Q).

Fish Ladder

Since WY 1997, the MPWMD has recorded water temperature in the San Clemente Fish Ladder (MPWMD 2004). A continuous recording temperature probe is deployed

starting in early to mid-November and retrieved in early June in most years. Minimum, maximum and average water temperatures are graphed by water year for the recorded data set (Appendix Q). Average water temperature is about 12 ºC to 17 ºC in November, decreases to about 7 ºC to 13 ºC for the period of December through March and then steadily increases to about 20 ºC in June. Diurnal variation was 0 ºC to 3 ºC throughout the monitoring period.

Carmel River below San Clemente Reservoir

Water quality information is available for the Carmel River at three locations below San Clemente Reservoir. These locations are at the first riffle below the plunge pool, the Old Carmel River Dam (OCRD) Bridge, and the Sleepy Hollow Weir. The water quality information available from each location is summarized below. Water temperature measurements are summarized in Appendix Q.

FIRST RIFFLE BELOW THE PLUNGE POOL

Water quality measurements were taken in the first riffle below the plunge pool at the base of San Clemente Dam during the 2003 and 2004 drawdown events. Measured parameters included dissolved oxygen, turbidity, temperature, and hydrogen sulfide (2003 only).

Daily average dissolved oxygen concentrations recorded during 2003 and 2004 are based on measurements taken once in the morning and again in the late afternoon. Average dissolved oxygen values ranged from 8.5 mg/L to 9.4 mg/L in 2003 and from 8.5 mg/L to 9.6 mg/L in 2004. Average turbidity ranged from 1.3 to 26.2 NTU in 2003 and 0.5 to 12.3 NTU in 2004. Water temperature ranged from 16.0 ºC to 21.0 ºC in 2003 and from 15.7 ºC to 18.9 ºC in 2004.

Hydrogen sulfide measurements were taken daily during the 2003 drawdown. No hydrogen sulfide was detected in any of the test results.

THE OCRD BRIDGE

Dissolved oxygen, turbidity and temperature measurements were taken at the OCRD Bridge bi-weekly on average during the 2004 drawdown. Dissolved oxygen concentration ranged from 8.3 to 9.5 mg/L, turbidity ranged from 0.5 to 11.9 NTU, and temperature ranged from 16.1 5 ºC to 19.5 ºC (Appendix Q).

SLEEPY HOLLOW WEIR

Dissolved oxygen, turbidity and temperature measurements were taken near the Sleepy Hollow Weir (SHW) bi-weekly on average during the 2004 drawdown. Dissolved oxygen concentration ranged from 8.5 mg/L to 9.3 mg/L, turbidity ranged from 1.1 NTU to 8.6 NTU, and water temperature ranged from 15.7 ºC to 20.4 ºC.

Long-term water quality monitoring has also been conducted by the MPWMD at the SHW (MPWMD 2004, MPWMD 1998). Semi-monthly measurements of temperature,

dissolved oxygen, pH, and specific conductance have been collected since WY 1992, and turbidity measurements have been collected since WY 2003. Results for water temperature and dissolved oxygen for the period from WY 1992 to WY 2003 at the SHW monitoring station are as follows:

- Minimum water temperature ranged from 7 ºC to 8 ºC and typically occurred in December and/or January. Maximum water temperature ranged from 21 ºC to 24 ºC and typically occurred in July and/or August.

- Minimum dissolved oxygen concentration ranged from 8 to 10 mg/L and typically occurred in June, July, August, and September. Maximum dissolved oxygen concentration ranged from 12 to 14 mg/L and typically occurred in January, February and March.

Turbidity measurements collected in WY 2003 at the SHW station ranged from 0 NTU (February) to 19 NTU (September) and averaged 4.1 NTU.

Since water year (WY) 1996, the MPWMD has recorded water temperature at the SHW monitoring station (MPWMD 2004, MPWMD 1998). A continuous recording temperature probe is typically deployed year-round. Minimum, maximum and average water temperatures are graphed by water year for the recorded data set. Minimum water temperatures of about 10 ºC typically occur in December and/or January. Maximum water temperatures of about 24 ºC typically occur in July and/or August.

2030 Baseline Conditions

It is expected that the reservoir would eventually fill with sediment (within 6 to 10 years) and uncontrolled sediment discharge would occur over the Dam spillway. This could result in elevated turbidity for short periods of time, primarily occurring during and shortly after storm runoff events. However, since turbidity already increases significantly during and after storm events, turbidity increases occurring during storm events after the reservoir has filled with sediment may not be measurably different than sediment discharge occurring during storm events under baseline conditions.

It is expected that interim drawdown would not be required after the reservoir fills with sediment (once reservoir capacity is less than 50-AF). Therefore, the water quality effects associated with drawdown would not occur. However, if shallow water levels exist in the reservoir, there may be associated temperature increases and dissolved oxygen decreases. Water discharged from the reservoir may increase in temperature relative to upstream conditions. The descent of water from the spillway or ports to the plunge pool would serve to aerate the water, thus increasing dissolved oxygen levels between the reservoir and downstream reaches.

4.3.2 ENVIRONMENTAL RESOURCE IMPACT STANDARDS AND METHODS

Standards of Significance

The significance criteria for evaluating water quality impacts resulting from the Proponent's Proposed Project are based on the following considerations. In accordance with the CEQA, CEQA Mandatory Findings of Significance, and agency and professional standards, a project impact would be significant if the project:

- Substantially affects a rare or endangered species of animal or plant or the habitat of the species;
- Substantially diminishes habitat for fish, wildlife or plants;
- Contaminates a public water supply;
- Violates any water quality standards or waste discharge requirements;
- Substantially alters the existing drainage pattern in a manner which would result in substantial erosion or siltation;
- Creates a potential public health hazard or involves the use, production or disposal of materials which pose a hazard to people or animal or plant populations in the area affected;
- Creates or contributes runoff water which would provide substantial additional sources of polluted runoff; or
- Otherwise substantially degrades water quality.

4.3.3 IMPACTS AND MITIGATION

Impact Assessment Methodology

This assessment evaluates and identifies impacts over a range of temporal scales. Time frames for project impacts are based on Carmel River fisheries resources using the steelhead life-cycle. The three temporal impact categories are:

- Short-term impacts that occur within the construction period (concurrent with the number of construction seasons, which vary from one alternative to another);
- Long-term impacts that persist beyond the construction period.

Analysis of potential water quality impacts was based on a review of the proposed construction activities described for the Proponent's Proposed Project and each alternative, including staging, equipment, supplies, and techniques. Post-project operations were also reviewed to assess their potential for water quality impacts, where applicable. Those activities that would involve substantial levels of disturbance

physically, temporally or geographically were also included in the water quality impact assessment.

Potential water quality impact mechanisms were identified based on the types of proposed construction activities. These include erosion and/or disturbance of soils, sediment and streambed materials; accidental spills or discharge of toxic substances; rerouting of streamflows; and discharge from sources of degraded water. The detailed Stormwater Pollution Prevention Plan (SWPPP) and the Spill Prevention, Containment, and Countermeasure Plan (SPCC) are included in Appendices K and R. These plans may be further modified during permit consultation with the Central Coast Regional Water Quality Control Board (CCRWQCB) and other appropriate permitting agencies. These plans provide the detailed mitigation procedures outlined in this section. The associated potential impacts could include elevated water turbidity, elevated water temperature, decreased dissolved oxygen concentration, and/or adverse levels of toxic substances in the water. Increases in river and/or reservoir water turbidity and temperature, decreases in dissolved oxygen concentration, and elevated levels of toxic substances could have an adverse impact on aquatic habitat and organisms or violate water quality standards.

The discussion of impact assessments and proposed mitigation measures are organized by activities that have a common potential impact mechanism and types of impacts. Potential impact mechanisms related to construction activities include:

- The presence of workers, equipment, machinery, and supplies within and along the active channel of Carmel River, San Clemente Creek and Tularcitos Creek and along portions of the access roads;
- Dewatering and/or rerouting portions of the live channel and reservoir during construction;
- Release of drawdown water and bypassed water;
- Excavation and relocation of sediment in the reservoir; and
- Destruction or construction of concrete structures.

Potential impact mechanisms related to operational activities include sediment sluicing and/or dredging and discharges and access/repairs for the CAW surface water diversion.

The following impact issues have been defined for water quality:

- WQ-1: Road Construction and Improvement Activities (Sediment Discharge to Watercourses)

- WQ-2: Instream, Streambank and/or Stream Margin Construction Activities (Disturbance of Streambeds, Increased Turbidity)
- WQ-3: Accidental Leaks and Spills of Toxic Substances (Discharge of Toxic Substances)
- WQ-4: Stream Diversions Sheetpile Cutoff Walls and Cofferdams (Increased Suspended Sediment and Turbidity)
- WQ-5: Stream Diversions Ponded Areas (Increased Turbidity and Temperature, Decreased Dissolved Oxygen)
- WQ-6: Stream Diversions Return of Bypassed Flows (Localized Scour, Sedimentation and Turbidity)
- WQ-7: Rewatering after Stream Diversions (Fine Sediment and Toxics In Return Flow)
- WQ-8: Discharge From Settling Basins (Increased Temperature and Turbidity, Decreased Dissolved Oxygen)
- WQ-9: Reservoir Drawdown (Increased Turbidity, Decreased Dissolved Oxygen)
- WQ-10: Reservoir Sediment Excavation (Increased Turbidity)
- WQ-11: SCD Fish Ladder (Increased Turbidity, Release of Toxic Substances)
- WQ-12: OCRD Notching (Increased Turbidity, Release of Toxic Substances)
- WQ-13: Sluice Gates (Increased Turbidity)
- WQ-14: Dam-Related Construction or Demolition (Increased Turbidity, Release of Toxic Substances)
- WQ-15: Operations/Post-Project Conditions (Improved Post-Project Water Quality in Reservoir and Restored Streams)
- WQ-16: Sediment Disposal (Stormwater Sediment Discharge)
- WQ-17: Construction of Diversion Channel and Diversion Dike (Increased Turbidity)

Issues WQ-16 and WQ-17 do not apply to the Proponent's Proposed Project but are relevant to the effects of actions that would be undertaken under other alternatives. Impacts and Mitigation

Proponent's Proposed Project (Dam Thickening)

Issue WQ-1: Road Construction and Improvement Activities

Sediment discharge to watercourses, increased turbidity
Determination: ***less than significant with mitigation, short-term***

IMPACT

Access road construction and improvement activities for the Proponent's Proposed Project include the Tularcitos Route, the OCRD Bridge, and the Plunge Pool access road. Road improvements immediately upslope of the river, or where vegetation may be removed to accommodate road widening or new road construction could cause temporary to long-term localized changes in drainage patterns. These in turn could initiate slope instability, accelerate erosion, and introduce excess sediments to the stream channel. Road construction and improvements along the steep hillslopes and banks adjacent to the river could affect water quality by increasing turbidity.

MITIGATION

Potential water quality impacts would be mitigated to a less than significant level with implementation of the standard erosion control methods, BMPs, and associated water quality monitoring measures developed and included in the Storm Water Pollution Prevention Plan (SWPPP) (Appendix K) to ensure adequate protection of surface water quality in the Project Area. The SWPPP includes the project activities that will require the submittal of and implementation of BMPs, the associated monitoring of the BMPs, and provisions to halt construction/deconstruction activities if the BMPs are not effective, corrective measures should there be any problems with the BMPs, and provisions to re-initiate the construction/deconstruction activities. Compliance with measures identified in the SWPPP will ensure compliance with regulatory policies to minimize the potential for water quality impacts from construction activities. Specific BMPs may include construction of sediment barriers, straw bales, silt fences, sandbags and waterbars to control sediment from entering any water course. See Section 3 of the SWPPP (Appendix K).

The SWPPP may be modified during consultation with the CCRWQCB and other permitting agencies to include additional provisions to prevent impacts due to erosion and sediment input to project streams from construction/deconstruction activities. CAW has incorporated some of these mitigation measures as part of the Proponent's Proposed Project (Specifications Section 01560 Environmental Protection and Special Controls, Sections 1.02 and 1.06, [Woodward Clyde, December 9, 1998]). The specifications will be amended to require the contractor to submit BMPs that meet the measures specified in the SWPPP (Appendix K).

Issue WQ-2: Instream, Streambank, and/or Stream Margin Construction Activities

Disturbance of streambeds, increased turbidity
Determination: ***less than significant with mitigation, short-term***

IMPACT

The Proponent's Proposed Project would involve construction activities that require the use of machinery, equipment and workers in the streambed or vicinity of a stream and/or the removal of vegetation in the vicinity of a stream. These activities include installation of the Tularcitos Creek Bridge, improvement of the OCRD Bridge, modification of the OCRD, project staging in the plunge pool at the base of San Clemente Dam, dam foundation and face preparation, replacement of the San Clemente Dam fish ladder, and installation of sheetpile barriers in the Carmel River.

Instream and near-stream construction activities and/or vegetation removal may cause disturbance of streambed substrate, erosion of the streambank and soils of the stream margins, and/or the deposition of rock debris in and near the stream, resulting in increased stream turbidity at and downstream of the construction site.

MITIGATION

Potential water quality impacts would be mitigated to a less than significant level through implementation of measures identified in the SWPPP (Appendix K).

The SWPPP may be modified during consultation with the CCRWQCB and other permitting agencies to include additional provisions to prevent impacts due to erosion and sediment input to project streams from construction/deconstruction activities. CAW has incorporated some of these mitigation measures as part of the Proponent's Proposed Project (Specifications Section 01560 Environmental Protection and Special Controls, Sections 1.02 and 1.06, Woodward Clyde, December 9, 1998. The specifications will be amended to require the contractor to submit BMPs that meet the measures specified in the SWPPP and the BMPs will also include requirements of CDFG's 1601 and 1602 permits. The measures identified by the applicant will include, as a minimum, the following erosion control methods and procedures:

Erosion control measures such as small catch basins, filter fabrics, tarps, or straw bale barriers that prevent sediment from entering the Carmel River or Tularcitos Creek are installed, monitored for effectiveness, and maintained throughout the construction operations period. The detailed measures are described in Section 3, of the SWPPP (Appendix K),

Issue WQ-3: Accidental Leaks and Spills of Toxic Substances

Discharge of toxic substances
Determination: ***less than significant with mitigation, short-term***

IMPACT

Accidental leaks and spills of chemicals or fluids (including petroleum-based products) from equipment and machinery, wet concrete, concrete leachate or particulates, or demolition debris in the construction area could release potentially toxic substances

directly to surface water, or to soil areas within the margins of the active channel. This would potentially violate water quality standards or impact aquatic resources.

MITIGATION

Potential water quality impacts would be mitigated to a less than significant level through implementation of BMPs identified in the SWPPP (Appendix K) and the SPCC Plan (Appendix R).

The SWPPP may be modified during consultation with the CCRWQCB and other permitting agencies to comply with additional regulatory requirements. The SWPPP requires contractors to submit a Spill Prevention, Containment, and Countermeasure (SPCC) Plan. The preliminary SPCC Plan (Appendix R) includes, at minimum, the following measures to protect water quality:

- Refueling of construction equipment and vehicles in the staging area would only occur within a designated, paved, and bermed area where possible spills can be contained. Fuel storage would be in double contained areas, capable of holding 125 percent of the volume of fuel being stored.

- Truck and cement equipment wash-down would not occur in the ordinary high water area of the channel.

- Equipment and vehicles operated within the ordinary high water would be checked and maintained daily to prevent leaks of fuels, lubricants, or other fluids to the stream.

- Litter and construction debris would be removed from below the ordinary high water line daily and disposed of at an appropriate site. All litter, debris, and unused materials, equipment or supplies would be removed from the construction staging areas above ordinary high water at the end of the construction season.

- At the end of each workday, all construction equipment will be moved to the staging area to protect against accidental spills.

- All vehicles carrying over 150 gallons of fuel will have a fuel spill prevention plan and all materials required to clean up a spill if it were to occur in transit. In some cases, a vehicle following the fuel truck would carry the clean-up equipment.

Issue WQ-4: Stream Diversions, Sheetpile Cutoff Walls, and Cofferdams

Increased suspended sediment and turbidity
Determination: ***less than significant, no mitigation required***

IMPACT

To implement the Proponent's Proposed Project, stream diversions would be required the following areas: Tularcitos Creek, partial stream diversion at the OCRD (Old Carmel

River Dam) Bridge for construction, the Carmel River at the plunge pool, and the Carmel River above the reservoir. Stream diversions would be constructed by installing either coffer dams or sheetpile barriers in the stream, directing water around the construction area and downstream through a pipeline, and discharging water into the stream below the work area.

Installation of a sheetpile cutoff wall or coffer dam in the stream would cause increased suspended sediment near and immediately downstream. This could result in a temporary turbidity increase that would likely extend less than one mile downstream and persist for less than one day.

MITIGATION

The duration and extent of turbidity caused by installation of sheetpiles or check dams would not cause significant water quality effects. No mitigation would be required. A water quality monitoring program will be finalized and implemented as part of the SWPPP (Appendix K) to ensure no adverse effects to water quality will occur due to the construction activities. The monitoring program will be reviewed and approved by the CCRWQCB and other appropriate permitting agencies.

Issue WQ-5: Stream Diversions Ponded Areas

Increased turbidity and temperature, decreased dissolved oxygen
Determination: ***less than significant with mitigation, short-term***

IMPACT

Installation of sheetpile barriers or a check dam would create a ponded area with an increase of water temperature and turbidity. As water flows through the diversion pipeline, water temperature could undergo further increases, with associated decreases of dissolved oxygen concentration. Water discharged downstream of the construction area could have increased temperature and turbidity and decreased dissolved oxygen levels.

MITIGATION

Potential water quality impacts would be mitigated to a less than significant level with implementation of the following measures contained in the SWPPP. The SWPPP will be reviewed and finalized during consultation with the CCRWQCB and other appropriate permitting agencies.

- The bypass pipeline would be appropriately sized and designed to minimize heating and provide rapid transport of water around the construction site, to the release point downstream of the construction site. CAW would use white or reflective color for the pipeline to reduce solar heating.

Stream temperatures, dissolved oxygen and turbidity downstream of the Dam would be monitored during the construction period. CAW would establish criteria for maximum water temperatures, minimum dissolved oxygen, and maximum turbidity based on

steelhead requirements and approved by CDFG and NMFS. Guidelines for these requirements have been established in the Biological Opinion provided by NMFS for the interim dam drawdown project (NMFS 2007). As part of the onsite biological monitoring, bypass water temperatures, dissolved oxygen, and turbidity would be monitored daily. If water temperatures exceed the criteria, the bypass flow would be mixed with cooler water from the upstream well point field to reduce temperatures in the Carmel River to an acceptable level.

Issue WQ-6: Stream Diversions Return of Bypassed Flows

Localized scour, sedimentation and turbidity
Determination: ***less than significant with mitigation, short-term***

IMPACT

Bypassed stream flows would be discharged back into the stream below the active construction area and could cause localized scour, sedimentation and turbidity effects.

MITIGATION

The project includes the installation of energy dissipation structures in the areas where bypassed project waters would be discharged. This would mitigate potential scouring, sedimentation and turbidity effects to a less than significant level. No further mitigation measures are needed.

Issue WQ-7: Rewatering After Stream Diversions

Fine sediment and toxins in return flow
Determination: ***less than significant with mitigation, short-term***

IMPACT

Following completion of construction activities, streamflow would be returned to the previously dewatered area. Water quality standards could be violated if fine sediments and/or toxic materials settled in the dewatered area during construction.

MITIGATION

Potential water quality impacts would be mitigated to a less than significant level through implementation of appropriate BMPs identified in the SWPPP (Appendix K). During permit consultation, the SWPPP may be further revised by the CCRWQCB and other appropriate agencies to comply with regulatory conditions.

Appropriate BMPs that could mitigate these impacts include use of a filter cloth or other fabric barrier placed on the ground surface of the active construction area to catch fine sediments, cement dust or other materials that are used or spilled during construction activities. All sand-size and finer construction fill and any angular crushed rock would be removed from the construction area and disposed of at an appropriate off-site location.

Issue WQ-8: Discharge from Settling Basins

Increased temperature and turbidity, decreased dissolved oxygen
Determination: ***less than significant with mitigation, short-term***

IMPACT

Temporary settling basins would be constructed below the plunge pool, at the OCRD Bridge, and in the reservoir near the 494-foot elevation intake. Water that is ponded in settling basins would experience increased temperature, decreased dissolved oxygen concentration and increased turbidity. This water may be discharged or leak around the bottom or edges of the settling basin into downstream waters, resulting in degradation of water quality.

MITIGATION

Potential water quality impacts would be mitigated to a less than significant level through implementation of BMPs identified in the SWPPP (Appendix K). The SWPPP and BMPs may be further revised during permit consultation with the CCRWQCB and other appropriate regulatory agencies. The BMPs selected to mitigate these impacts will include the following:

- Water would be pumped from the temporary settling basins to a sedimentation tank/holding facility located above the ordinary high water zone that allows only clear water to be returned to the stream. Settled solids would be disposed of at an appropriate off-site location.

- Routine monitoring and reporting of the discharge water and the receiving water conditions would be conducted. If effluent water quality does not meet water quality criteria, discharge would be discontinued until acceptable conditions are met. If necessary, additional water filtration would be implemented.

Issue WQ-9: Reservoir Drawdown

Increased turbidity, decreased dissolved oxygen
Determination: ***significant, unavoidable, short-term***

IMPACT

The lowering of water levels in the reservoir would cause increased turbidity and decreased dissolved oxygen levels. Although reservoir water temperatures naturally increase during the summer season, temperature stratification is unlikely and water temperature increases at depth in the reservoir could be greater than normal due to the shallow reservoir water level. Installation of a sheetpile barrier in the reservoir and removal of sediments near the intake gate would cause additional turbidity increases.

In addition to fine suspended solids, the release of stream channel porewater from the Carmel River and San Clemente Creek into the reservoir would cause iron oxidation to occur, further increasing turbidity and decreasing dissolved oxygen levels. During and following drawdown, movement of sediments previously deposited near the mouths of

the Carmel River and San Clemente Creek could slump and shift into the reservoir. This sediment movement could cause further release of anaerobic porewater, resulting in lowered dissolved oxygen.

Because water quality degradation could not be mitigated to a less-than-significant level in the reservoir, this would be a short-term, significant and unavoidable impact.

MITIGATION

Water quality degradation resulting from drawdown of reservoir water level would not be mitigable to a less than significant level. The reservoir water level would be drawn down at a relatively slow rate (about 0.5 feet or less per day), similar to that currently being used for the annual drawdown (an interim dam safety measure). However, this measure would be employed to minimize impacts to the extent possible.

Issue WQ-10: Reservoir Sediment Excavation

Increased turbidity
Determination: ***less than significant with mitigation, short-term***

IMPACT

Some sediment would be excavated from the area around the 494-foot elevation intake in the reservoir. A temporary settling basin would be constructed around the intake gate. Installation of the settling basin and sediment excavation could result in elevated turbidity within the reservoir and in waters being discharged downstream.

MITIGATION

The excavation and construction work in the reservoir to clear sediment from behind the 494-foot intake gate would cause temporary increases in turbidity. Potential water quality effects would be mitigated to less than significant by implementing the BMPs identified in the SWPPP (Appendix K). The SWPPP and BMPs may be modified during permit consultation with the CCRWQCB and other appropriate regulatory agencies.

Erosion control measures such as use of small catch basins, filter fabrics, tarps, or straw bale barriers that prevent sediment from entering the Carmel River would be installed, monitored for effectiveness, and maintained throughout the duration of construction operations. Detailed measures are described in the SWPPP (Appendix K).

Issue WQ-11: SCD Fish Ladder

Increased turbidity, release of toxic substances
Determination: ***less than significant with mitigation, short-term***

IMPACT

Replacement of the San Clemente Dam fish ladder would involve the removal of hillslope vegetation, displacement of soil on the hillslope, destruction and removal of the current concrete fish ladder, and construction of the new fish ladder. The activities

associated with removal and replacement of the San Clemente Dam fish ladder could cause hillslope erosion and delivery of fine sediments or concrete debris to the Carmel River, resulting in increased turbidity or release of toxic materials. These effects could potentially violate water quality standards or impact aquatic resources.

MITIGATION

Potential water quality effects associated with hillslope construction activities during replacement of the San Clemente Dam fish ladder would be mitigated to a less than significant level through implementation of BMPs identified in the project SWPPP and the SPCC Plan (Appendices K and R). These plans may be further modified during permit consultation with the CCRWQCB and other appropriate regulatory agencies. All applicable components of mitigation measures for Issues WQ-1 (Road Construction and Improvement Activities), WQ-2 (Instream, Streambank and/or Stream Margin Construction Activities), WQ-3 (Accidental Leaks and Spills of Toxic Substances) and WQ-7 (Rewatering after Stream Diversions) described above would be implemented.

Issue WQ-12: OCRD Notching

Increased turbidity, release of toxic substances
Determination: ***less than significant with mitigation, short-term***

IMPACT

Modification of the OCRD would involve notching one side of the concrete dam about 9-feet deep and 19-feet wide. Notching the OCRD would require cutting and removal of concrete within the streambed and stream margins. The release or deposition of concrete particles in surface waters could violate water quality standards or impact aquatic resources. This would be a potentially significant, mitigable effect.

MITIGATION

Potential water quality impacts would be mitigated to a less than significant level with implementation of appropriate BMPs and associated water quality monitoring identified as part of the project SWPPP (Appendix K). Mitigation measures for Issues WQ-2 (Instream, Streambank and/or Stream Margin Construction Activities), WQ-3 (Accidental Leaks and Spills of Toxic Substances) and WQ-7 (Rewatering After Stream Diversions) described above would be implemented.

Issue WQ-13: Sluice Gates

Increased turbidity
*Determination****: significant, unavoidable, long-term***

IMPACT

Installation and operation of sluice gates in the Dam would cause suspended sediment increases in the reservoir and in the Carmel River downstream of the Dam, resulting in elevated turbidity levels. Operation of sluice gates would likely occur once or twice a year over the life of the Dam. During the sluicing operation, as much as 2.4 acre-feet of

sediment could be discharged downstream of the Dam over a 2-hour time period. Since this would occur on the rising limb of the hydrograph when flows are expected to continue increasing, a large proportion of the sediment would be carried downstream as suspended sediment. This would cause increased turbidity levels that would likely extend more than one mile downstream. The duration of elevated turbidity would depend on the actual length of time that sluicing was conducted as well as the actual flows that occurred. It is estimated that elevated turbidity would last from 12 to 36 hours.

MITIGATION

Operation of the sluice gates would occur during periods of high runoff, a time when natural high turbidity flows typically go over the spillway of San Clemente Dam. To initiate operation of the sluice gate, flows would be at a minimum of 300 cfs, occurring during a flow regime when any increase in turbidity would result in the least impact compared to baseline conditions. The detailed sluice plan is included in Sediment Management and Operations Plan (SOMP, Appendix J). While the turbidity increase is a small increase over the baseline occurring only for a short duration, it is not possible to conclude that water quality degradation resulting from sediment sluicing will be less than significant.. However, any potential impacts will be minimized to the extent possible by cooperating with the CCRWQCB, NMFS, CDFG and the USACE to establish appropriate turbidity standards and zones of dilution. In consultation with the regulatory agencies and Project Engineer, appropriate BMPs and water quality monitoring would be implemented to ensure adequate protection of aquatic resources during sluice gate operation. Measures to reduce construction-related turbidity impacts are identified in the SWPPP (Appendix K).

Issue WQ-14: Dam-Related Construction or Demolition

Increased turbidity, release of toxic substances and fine-grained sediment
Determination: ***less than significant with mitigation, short-term***

IMPACT

Storage of stockpiled raw materials, transfer of materials to concrete mixer trucks, transport of concrete in mixer trucks, and equipment storage presents the risk of particulate materials or chemicals washing onto the ground surface or accidentally spilling. Preparation activities on the Dam surface and adjacent bedrock surfaces present the risk of releasing fine-grained particles in the Carmel River channel. The application of wet concrete during dam thickening presents the risk of wet or dry concrete being released into the Carmel River channel. These materials could drain into surface or groundwater sources, resulting in unsafe levels of toxic substances and/or elevated turbidity.

MITIGATION

Potential water quality impacts would be mitigated to a less than significant level with implementation of the following measures that are included as part of the project SWPPP and SPCC Plan (Appendices K and R). Appropriate BMPs such as

containment features would be identified and utilized for storage of stockpiled raw materials. The SPCC Plan identifies preventative measures to avoid spills of raw materials or wet concrete and includes a spill response and clean-up plan in the case of accidental spills.

Potential water quality impacts related to dam surface preparation and concrete application would be mitigated to a less than significant level by placing a fabric barrier on the ground surface below and near the work area to catch sediment and cement particles. These materials would be disposed of at an appropriate off-site location. A water quality monitoring program will be implemented as specified in the SWPPP to ensure the effectiveness of the installed BMPs.

The SWPPP and SPCC Plan will be reviewed and finalized during consultation with the CCRWQCB and other appropriate permitting agencies

Issue WQ-15: Operations/Post-Project Conditions

Improved post-project water quality in reservoir and restored streams
Determination: ***beneficial***

IMPACT

Under the Proponent's Proposed Project, upon project completion, annual drawdown of the reservoir will be discontinued. Consequently, water quality conditions that normally degrade due to the current annual drawdowns would be expected to return to normal summer conditions that existed without drawdown. This is a beneficial impact.

MITIGATION

No mitigation would be required.

Alternative 1 (Dam Notching)

Water Quality impacts and mitigation for Issue WQ-1 would be the same as described for the Proponent's Proposed Project, including the same road improvement activities, with the addition of road improvement activities for the Cachagua Route, but not for the Tularcitos Route. Water Quality impacts and mitigation for Issue WQ-2 (Instream, Streambank, and/or Stream Margin Construction Activities) would be the same as the Proponent's Proposed Project but the impacted area would be greater at 7.7 acres. Water Quality impacts and mitigation for Issues WQ-3 (Accidental Leaks and Spills of Toxic Substances), WQ-4 (Stream Diversion Sheetpile Cutoff Walls and Check dams), WQ-5 (Stream Diversions Ponded Areas), WQ-6 (Stream Diversions Return of Bypassed Flows), WQ-7 (Rewatering after Stream Diversions), WQ-8 (Discharge from Settling Basins), WQ-11 (SCD Fish Ladder), WQ-12 (OCRD Notching), and WQ-15 (Operations/Post-Project Conditions) would be the same as those described for the Proponent's Proposed Project except that Tularcitos Creek would not be affected. An additional construction stream diversion would occur on San Clemente Creek, which would require the same mitigation measures as described for other construction

diversions. WQ-13 (Sluice Gates) would be the same as the Proponent's Proposed Project although the impact would be greater with more sediment moving downstream but the mitigation would be the same.

Issue WQ-17 (Construction of Diversion Channel and Diversion Dike) is specific to Alternative 3 (Carmel River Reroute and Dam Removal), and does not apply.

Issue WQ-9: Reservoir Drawdown

Increased turbidity, decreased dissolved oxygen
Determination: ***significant, unavoidable, short-term***

Impacts and mitigation would be similar to that described for the Proponent's Proposed Project (significant and unavoidable impact). However, the extent of the impact would likely be greater due to the need to conduct a faster drawdown to reduce the reservoir level below previous drawdown levels. Drawdown impacts would occur over three construction seasons.

Issue WQ-10: Reservoir Sediment Excavation

Increased turbidity, decreased dissolved oxygen
Determination: ***significant, unavoidable, short-term***

IMPACT

About 1.5 million cubic yards of sediment would be excavated using self-loading scrapers and transported to a central stockpile area within the reservoir area, where the material would be allowed to drain further. The stockpile area would be located at the mouth of the ravine where the sediment disposal site 4R is located.The reservoir level would be drawn down and a settling basin would be adjacent to the Dam. Fresh water inflow would be minimal due to the diversion of the Carmel River and San Clemente Creek around the reservoir. These activities would occur over a period of two summer seasons. Excavation of sediments above the reservoir could cause further turbidity increases and dissolved oxygen decreases within the reservoir through disturbance of sediments and subsurface flows. Very fine suspended sediments and iron oxides would be expected to remain in suspension in the reservoir, resulting in elevated turbidity and decreased dissolved oxygen levels during the two periods of excavation activity and for about two months following excavation.

MITIGATION

The effects of sediment excavation on turbidity and dissolved oxygen in the reservoir would be significant and unavoidable. No mitigation measures would reduce the impact to less than significant.

Issue WQ-14: Dam-related Construction or Demolition

Increased turbidity, release of toxic substances and fine-grained sediments
Determination: ***less than significant with mitigation, short-term***

IMPACT

Dam notching would involve the removal of about 700 cubic yards of concrete from the Dam by saw-cutting the concrete and reducing the size of concrete blocks using light blasting or hydraulic hammers. The release or deposition of concrete particles in surface waters could violate water quality standards or impact aquatic resources.

MITIGATION

Mitigation for Issues WQ-2 (Instream, Streambank and/or Stream Margin Construction Activities), WQ-3 (Accidental Leaks and Spills of Toxic Substances) and WQ-7 (Rewatering after Stream Diversions) as described for the Proponent's Proposed Project would be implemented.

Potential water quality impacts related to demolition activities would be mitigated to a less than significant level by implementing appropriate BMPs identified in the project SWPPP (Appendix K). Appropriate BMPs include placing blasting mats over the concrete blocks to prevent flying concrete debris. In addition, a fabric barrier would be placed on the ground surface in the active construction/demolition area to catch sediment and cement debris. A water quality monitoring program would be implemented as specified in the SWPPP, with oversight by the CCRWQCB, to ensure the effectiveness of the BMPs.

Issue WQ-16: Sediment Disposal

Stormwater sediment discharge at sediment disposal site
Determination: ***less than significant with mitigation, long term***

IMPACT

Sediment disposal would cover about 16 acres at the sediment disposal site 4R. Although erosion protection measures have been incorporated into Alternative 1 (described in Section 4.1.3, Alternative 1, Issue GS-4), sediment could potentially be entrained in the sediment disposal area during large and/or prolonged stormwater runoff events and discharged to the Carmel River, where it could cause sedimentation and increase turbidity. This would be a long-term, potentially significant and mitigable impact.

MITIGATION

Potential water quality impacts would be mitigated to a less than significant level by implementing appropriate BMPs identified in the SWPPP (Appendix K). The BMPs will be adopted in consultation with the CCRWQCB and will be adopted by the contractor and submitted to the Project Engineer for approval. The BMPs will include the following:

- The sloping sediment surface and other disturbed areas will be stabilized by sediment barriers, straw mulch, and silt fences.

- Provide sediment collection features such as silt bales and sandbags.

- Provide sediment traps along the toe of the pile and other disturbed areas.

- Monitor erosion control methods for effectiveness and maintain these methods throughout the duration of construction operations.

- Place two-foot-layer of organic soil on the sediment slope at the end of construction and seed

The effectiveness of erosion protection measures at Site 4R (as described in Section 4.1.3) would be monitored annually, as described in the SWPPP, for a period of 10 years at the end of each rainy season with additional monitoring conducted periodically during the rainy season to identify any imminent erosion problems from stormwater runoff providing an opportunity for the erosion to be mitigated with the incorporation of additional appropriate BMPs. Any observed erosion problems would be repaired or improved prior to the following rainy season. These adaptive measures may include further reinforcement of the sediment pile with rock and/or additional revegetation with native plants and trees.

Alternative 2 (Dam Removal)

Water Quality impacts and mitigation for Issue WQ-1 (Road Construction and Improvement Activities) would be the same as described for the Proponent's Proposed Project plus road improvement activities for the Cachagua Route, but not for the Tularcitos Route. Water Quality impacts and mitigation measures for Issues WQ-3 (Accidental Leaks and Spills of Toxic Substances), WQ-4 (Stream Diversion Sheetpile Cutoff Walls and Check dams), WQ-5 (Stream Diversions Ponded Areas), WQ-6 (Stream Diversions Return of Bypassed Flows), WQ-7 (Rewatering after Stream Diversions), WQ-8 (Discharge from Settling Basins), and WQ-12 (OCRD Notching) would be the same as described for the Proponent's Proposed Project, except that Tularcitos Creek would not be affected. There would be an additional construction stream diversion on San Clemente Creek which would require the same mitigation measures as described for other construction diversions. The sediment management methods for reservoir excavation would be the same as in Alternative 1. Therefore the impacts and mitigation for WQ-10 (Reservoir Sediment Excavation) are the same in kind as described in Alternative 1, but greater in scope because 2.5 million cubic yards of sediment would be excavated.

The San Clemente Dam fish ladder would be removed and Issue WQ-11 (SCD Fish Ladder) also would not apply. Since the Dam would be removed, Issue WQ-13 (Sluice Gates) would not apply.

Issue WQ-17 (Construction of Diversion Channel and Diversion Dike) is specific to Alternative 3, and does not apply.

Issue WQ-2: Instream, Streambank, and/or Stream Margin Construction Activities

Disturbance of streambeds, increased turbidity
Determination: ***less than significant with mitigation, short-term***

IMPACT

Impacts would be the same as described for the Proponent's Proposed Project, except that Tularcitos Creek would not be affected and San Clemente Dam would be completely removed under Alternative 2. The removal of San Clemente Dam would affect a larger area (approximately 8.9 acres) of instream, streambank and stream margin habitat.

MITIGATION

Mitigation measures would be the same as described for the Proponent's Proposed Project, except that the extent of required mitigation would be greater.

Issue WQ-9: Reservoir Drawdown

Increased turbidity, decreased dissolved oxygen
Determination: ***significant, unavoidable, short-term***

Under Alternative 2, the reservoir would be completely dewatered during project implementation. Therefore the drawdown of the reservoir would occur once during this Alternative. The impacts would be similar to the Proponents Proposed Project.

MITIGATION

Mitigation measures would be the same as described for the Proponent's Proposed Project.

Issue WQ-14: Dam-Related Construction or Demolition

Increased turbidity, release of toxic substances and fine-grained sediment
Determination: ***less than significant with mitigation, short-term***

IMPACT

Dam removal would involve the removal of about 7,000–8,000 cubic yards of concrete from the Dam by explosives or saw-cutting the concrete and reducing the size of concrete blocks using light blasting or hydraulic hammers. The release or deposition of concrete particles in surface waters could violate water quality standards or impact aquatic resources.

MITIGATION

Potential water quality impacts related to demolition activities would be mitigated to a less than significant level by implementing appropriate BMPs incorporated in the SWPPP (Appendix K). BMPs to mitigate these impacts include placing blasting mats over the Dam and concrete blocks to prevent flying concrete debris and placement of a

fabric barrier on the ground surface in the active construction/demolition area to catch sediment and cement debris.

Issue WQ-15: Operations / Post-Project Conditions

Improved post-project water quality in reservoir and restored streams
*Determination**: beneficial***

IMPACT

Under Alternative 2, water quality conditions would not be affected by the presence of the reservoir and would be expected to be similar to conditions that currently exist upstream of the reservoir. This is would be a beneficial impact.

MITIGATION

No mitigation would be required.

Issue WQ-16: Sediment Disposal

Stormwater sediment discharge

*Determination: **less than significant with mitigation, long-term***

IMPACT

Impacts would be similar to those described for Alternative 1. Sediment disposal would cover about 23 acres at the sediment disposal site. Although erosion protection measures have been incorporated into Alternative 2 (described in Section 4.1.3, Alternative 1, Issue GS-4), sediment could be entrained in the sediment disposal area during large and/or prolonged stormwater runoff events and discharged to the Carmel River, where it could cause sedimentation and increase turbidity. This would be a long-term, potentially significant and mitigable impact.

MITIGATION

Mitigation would be the same as Alternative 1 WQ-16 (Sediment Disposal).

Alternative 3 (Carmel River Reroute and Dam Removal)

Water Quality impacts and mitigation for Issue WQ-1 (Road Construction and Improvement Activities) would be the same as described for the Proponent's Proposed Project, plus road improvement activities for the Cachagua route, but excluding the Tularcitos route. Impacts and mitigation for Water Quality Issues WQ-3 (Accidental Leaks and Spills of Toxic Substances), WQ-4 (Stream Diversion Sheetpile Cutoff Walls and Check dams), WQ-5 (Stream Diversions Ponded Areas), WQ-6 (Stream Diversions Return of Bypassed Flows), WQ-7 (Rewatering after Stream Diversions), WQ-8 (Discharge from Settling Basins), and WQ-12 (OCRD Notching) also would be the same as described for the Proponent's Proposed Project, except that Tularcitos Creek would not be affected. There would be an additional construction diversion on San Clemente Creek which would require the same mitigation measures as described for other construction diversions.

Water Quality Impacts and mitigation for Issues WQ-9 (Reservoir Drawdown) and WQ-15 (Operations/Post-Project Conditions) would be the same as described for Alternative 2.

The sediment management methods for reservoir excavation would be the same as in Alternative 1. Therefore the impacts and mitigation for WQ-10 (Reservoir Sediment Excavation) are the similar to those described in Alternative 1 but would be less because less than 500,000 cubic yards of sediment would be excavated.

The San Clemente Dam fish ladder would be removed and Issue WQ-11 (SCD Fish Ladder) also would not apply. Since the Dam would be removed, Issue WQ-13 (Sluice Gates) would not apply.

Issue WQ-2: Instream, Streambank, and/or Stream Margin Construction Activities

Disturbance of streambeds, increased turbidity
Determination: ***less than significant with mitigation, short-term***

IMPACT

Impacts would be the same as described for the Proponent's Proposed Project, except that Tularcitos Creek would not be affected and San Clemente Dam would be completely removed under Alternative 3. The removal of San Clemente Dam would affect a larger area (approximately 8.6 acres) of instream, streambank and stream margin habitat.

MITIGATION

Mitigation measures would be the same as described for the Proponent's Proposed Project, except that the extent of mitigations applied would be greater.

Issue WQ-14: Dam-Related Construction or Demolition

Increased turbidity, release of toxic substances
Determination: ***less than significant with mitigation, short-term***

Water Quality Impacts and mitigation for Issue WQ-14 (Dam-Related Construction or Demolition) would be similar to that described for Alternative 2.

MITIGATION

Potential water quality impacts related to demolition activities would be mitigated to a less than significant level by implementing appropriate BMPs incorporated in the SWPPP (Appendix K). BMPs to mitigate these impacts include placing blasting mats over the Dam and concrete blocks to prevent flying concrete debris and placement of a fabric barrier on the ground surface in the active construction/demolition area to catch sediment and cement debris.

Issue WQ-16: Sediment Disposal

Stormwater sediment discharge
Determination: ***less than significant with mitigation, long-term***

IMPACT

Impacts would be similar to those described for Alternative 1 except that sediment disposal would cover about 13 acres in the bypassed arm of the Carmel River. Although erosion protection measures have been incorporated into Alternative 3 (Section 3.5.4 and Section 4.1.3, Alternative 1, Issue GS-4), sediment could be entrained in the sediment disposal area during large and/or prolonged stormwater runoff events and discharged to the Carmel River, where it could cause sedimentation and increase turbidity. This would be a long-term, potentially significant and mitigable impact.

MITIGATION

Potential water quality impacts would be mitigated to a less than significant level by implementing the measure described below. Appropriate BMPs incorporated in the SWPPP (Appendix K) will be implemented by contractor with approval by the Project Engineer and the RWQCB and other appropriate regulatory agencies. The BMPs will include the following:

- The sloping sediment surface and other disturbed areas will be stabilized by sediment barriers, straw mulch, and silt fences.
- Provide sediment collection features such as silt bales and sandbags.
- Provide sediment traps along the toe of the pile and other disturbed areas.
- Monitor erosion control methods for effectiveness and maintain these methods throughout the duration of construction operations.
- Place two-foot-layer of organic soil on the sediment slope at the end of construction and seed.

The effectiveness of erosion protection measures in the bypassed arm of the Carmel River (described in Sections 3.5.4 and 4.1.3) would be monitored annually by CAW for a period of 10 years at the end of each rainy season. Any observed erosion problems would be repaired or improved prior to the following rainy season. These adaptive measures may include further reinforcement of the sediment pile with rock and/or additional revegetation with native plants and trees.

Issue WQ-17: Construction of Diversion Channel and Diversion Dike

Increased turbidity
Determination: ***less than significant mitigation, short-term***

IMPACT

Diversion channel construction would involve blasting and removal of about 234,000 cubic yards of rock between the two reservoir arms, reducing the rock into 1-foot or smaller pieces using hoe rams, and relocating the rock to build a diversion dike. Channel excavation activities would include construction of bankfull and thalweg channels in the diversion channel. These activities could cause the discharge of rock debris and the mobilization of fine sediments into San Clemente Creek and the Carmel River, resulting in elevated turbidity levels. Impacts related to construction activities would be short-term, whereas impacts related to erosion of the diversion channel or diversion dike following the project would be long-term.

MITIGATION

Potential water quality impacts would be mitigated to a less than significant level through implementation of BMPs incorporated in the SWPPP (Appendix K). Mitigation applying to Issues WQ-2 (Instream, Streambank and/or Stream Margin Construction Activities), WQ-3 (Accidental Leaks and Spills of Toxic Substances) and WQ-7 (Rewatering after Stream Diversions) described for the Proponent's Proposed Project would be implemented. In addition, a blasting mat would be used to catch and direct flying rock debris to an area where it can be readily removed. This material would be disposed of at an appropriate on-site location in the Carmel arm of the reservoir.

Alternative 4 (No Project)

Impacts and mitigation for Water Quality Issues WQ-1 (Road Construction and Improvement Activities), WQ-2 (Instream, Streambank, and/or Stream Margin Construction Activities) and WQ-3 (Accidental Leaks and Spills of Toxic Substances), applied to improvement activities at the OCRD Bridge and ongoing reservoir and dam maintenance, WQ-4 (Stream Diversions Sheetpile Cutoff Walls and Check dams), WQ-5 (Stream Diversions Ponded Areas), WQ-6 (Stream Diversions Return of Bypassed Flows), WQ-7 (Rewatering After Stream Diversions), and WQ-8 (Discharge from Settling Basins), WQ-10: (Reservoir Sediment Excavation), WQ-11 (SCD Fish Ladder), WQ-12 (OCRD Notching), and WQ-13 (Sluice Gates) WQ-14 (Dam-Related Construction or Demolition), WQ-16 (Sediment Disposal), and WQ-17 (Construction of Diversion Channel and Diversion Dike) address activities that would not be undertaken under the No Project Alternative, and would not apply.

Issue WQ-9: Reservoir Drawdown

Increased turbidity, decreased dissolved oxygen
*Determination**: significant, unavoidable, long-term***

IMPACT

Annual reservoir drawdowns would continue under the No Project Alternative until sediment has reduced the reservoir capacity to less than 50 AF (6 to 10 years). The lowering of water level in the reservoir would cause increased turbidity and decreased DO levels. Although reservoir water temperatures naturally increase during the summer

season, water temperature increases at depth in the reservoir could be greater than normal due to the shallow reservoir water level.

In addition to fine suspended solids, the release of stream channel porewater from the Carmel River and San Clemente Creek into the reservoir would cause iron oxidation to occur, further increasing turbidity and decreasing DO levels. During and following drawdown, movement of sediments previously deposited near the mouths of the Carmel River and San Clemente Creek could slump and shift into the reservoir. This sediment movement could cause further release of anaerobic porewater, resulting in lowered DO.

MITIGATION

Mitigation for impacts from Issue WQ-9 would not occur under the No Project Alternative.

Issue WQ-15: Operations / Post-Project Conditions

Increased turbidity, decreased dissolved oxygen
Determination: ***significant, unavoidable, long-term***

IMPACT

Existing operations would continue under the No Project Alternative. Potential impacts are the same as described for Issues WQ-9 (Reservoir Drawdown).

MITIGATION

Mitigation for impacts from Issue WQ-15 would not occur under the No Project Alternative.

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4.4 FISHERIES

This section describes existing conditions for aquatic habitat and fishery resources in the Carmel River and the Project Vicinity. It also provides an assessment of potential environmental impacts that would occur as a result of the implementation of the Proponent's Proposed Project or project alternatives. Fisheries and aquatic habitat information was taken from the 2000 RDEIR (Denise Duffy & Associates 2000), which is incorporated here by reference. Materials also reviewed included the Carmel River Dam and Reservoir Project Draft Supplemental EIR (MPWMD 1998), the Carmel Valley Watershed Conservancy assessments and the 2003, 2004 and 2005 to 2007 Biological Assessments for the San Clemente Dam Drawdown, the 2003, 2004 and 2005 Drawdown Reports, the Monterey Peninsula Water Supply Project EIR (MPWMD 1994) and information available on the web from MPWMD, the Carmel Valley Watershed Conservancy and the Carmel River Steelhead Association. Additional materials that were used in the completion of this section are referenced in the following text and included in the reference section. Expanded sediment transport modeling has been incorporated in the revised Sections 4.2 and 4.4 as a response to comments on the Draft EIR/EIS. In addition, some of the fisheries impacts were modified based on comments received on the Draft EIR/EIS.

4.4.1 ENVIRONMENTAL SETTING

The Carmel River currently supports native populations of Pacific lamprey *(Lampetra tridentata),* river lamprey *(Lampetra ayresi),* Sacramento hitch *(Lavinia exilicauda),* Sacramento blackfish (*Orthodon microlepidotus*), steelhead *(Oncorhynchus mykiss),* threespine stickleback *(Gasterosteus aculeatus),* prickly sculpin *(Cottus asper) and* coast range sculpin *(Cottus aleuticus).* Starry flounder *(Platichthys stellatus),* shiner perch *(Cymatogaster aggregata)* and Pacific staghorn sculpin *(Lepotocottus armatus)* can be found in the Carmel River lagoon (MPWMD 1994). Introduced fishes found in the Carmel River include goldfish *(Carassius auratus)*, carp *(Cyprinus carpio),* black bullhead *(Ictalurus melas),* brown trout *(Salmo trutta),* mosquitofish *(Gambusia affinis),* green sunfish *(Lepomis cyanellus),* and bluegill *(L. macrochirus)* (MPWMD 1994). Hitch, blackfish, steelhead, brown trout, threespine stickleback, mosquitofish and green sunfish are known to occur in the Project Area (ENTRIX 2003, 2004c, and 2005a).

There are two non-native crayfish found in the Carmel River, the signal crayfish (*Pacifasticus leniusculus*) and red swamp crayfish (*Procambarus clarkii*). The signal crayfish is commonly found in all habitats in the Carmel River mainstem. The red swamp crayfish is found in the river infrequently.

Of the fish species present in the river, steelhead are considered the most important management species. Most fisheries work in the river has been undertaken to add to knowledge of steelhead, their habitats and their use of that habitat. The Carmel River historically supported what the CDFG described in a 1983 report as the State's largest self-sustaining steelhead run (and the second largest fishery for this species) south of

San Francisco Bay (Snider 1983). Most of the habitat needs of other native fish species in the river would be met by maintaining steelhead habitat.

4.4.1.1 Steelhead Terminology

Steelhead is the anadromous form of coastal rainbow trout or *O. mykiss*, although steelhead may also exhibit a life history type that spends its entire lifecycle in freshwater. Anadromy is a life history pattern in which growth and maturity occur in saltwater, but spawning, incubation and a portion of the juvenile rearing occur in freshwater.

Steelhead spawn in locations in the streambed that have good intergravel flow through a gravel substrate to a small cobble substrate. These locations are often at the top of riffle or the very downstream end of a pool, also called a pool tail. The female steelhead will excavate a depression in the streambed by pumping her tail over the stream bottom. Eggs are released into the depression and fertilized by one or more males. This activity is repeated when the female moves upstream. The zygotes (fertilized eggs) are then covered in gravel as the female continues spawning. Spawning continues until the spawning fish have moved out of suitable spawning habitat or the female runs out of eggs. The area where steelhead have spawned is called a redd and may consist of a single or several nests of fertilized eggs covered with gravel.

Embryos incubate in the gravel for three to eight weeks (longer incubations are associated with lower temperatures). Alevins (also called sac fry or yolk-sac fry) are young steelhead that have recently hatched and remain in the gravel for another two to three weeks while they absorb their yolk sacks. When the yolk-sac has been absorbed, the fish emerge from the gravel and enter the water column as fry at a length of about an inch. These fish are called fry until they reach a size of about two and half inches. Larger steelhead are generally referred to as juveniles (two and a half inches to 8 inches or larger). Steelhead that are in their first year of life are called young-of-the-year (YOY) and are referenced as 0+ or YOY in this document. YOY includes fish that range from one-inch up to four to six inches in size by the end of their first year. Steelhead in their second year of life are called yearlings and are referenced as 1+ or yearlings in this document. These fish range in size from four to six inches early in the year to up to eight inches or larger in the fall. Growth rates vary depending on stream conditions, particularly temperature and food availability.

The Carmel River supports at least two year-classes of juvenile steelhead (0+ and 1+) in an ongoing cycle of spawning, growth and outmigration. As Age 1+ fish grow, become smolts and migrate to the ocean, a new crop of YOY steelhead populate the river from spawning that occurred during the previous winter and spring. Last year's YOY fish develop into yearlings.

When steelhead reach about eight inches long, most will become smolts. Smolting is a physiological change that prepares steelhead for life in the ocean. The physiological

change is accompanied by changes in appearance and behavior. Smolts actively move downstream toward the ocean as their residency time in freshwater comes to an end.

Unlike salmon, adult steelhead do not always die after spawning. Spawned out steelhead, called kelts, can migrate back to ocean and return as repeat spawners in a subsequent year (Barnhart 1986).

4.4.1.2 Carmel River Habitat

In this section, fish habitat is discussed in the context of its suitability for steelhead trout and includes spawning, incubation, rearing and migration habitats which are described below.

Spawning and incubation habitat is typically gravel-cobble substrate at the downstream end of pools or upstream end of riffles. Good quality spawning habitat includes sufficient depth of flow and water velocity over suitable substrate.

Rearing habitat supports the growth and development of juvenile steelhead from fry to Age 2+ juvenile. Good quality juvenile rearing habitat is characterized by sufficient streamflow, water quality (cool, clear, oxygenated water), sufficient water depth, and cover. Cover can be provided by rocky substrates, closely overhanging branches from trees or other riparian vegetation, instream woody debris, surface turbulence, depth greater than 3 feet, or other cover elements. Good quality rearing habitat also has sufficient aquatic and terrestrial invertebrates, key food resources used by developing steelhead. Fry grow rapidly through the spring, and as they grow they move from shallow (< 2 inches) river edge habitats, where water velocities are low, into deeper water in riffles, runs, and pools. Age 1+ steelhead use deeper habitats; some of the juveniles move downstream and use the lagoon as rearing habitat.

Rearing habitat has been assessed, modeled and compared for reaches upstream, downstream and between the two dams on the Carmel River because the dams are sites where migration may be impaired. To place the locations of the dams in context for the reader, San Clemente Dam (SCD) is located at River Mile (RM) 19.1 and Los Padres Dam (LPD) is located at RM 25.3 (Table 4.4-1). There are about five river miles between LPD and the historic inundation zone of SCD. There are ten river miles of mainstem Carmel River habitat upstream of Los Padres Reservoir.

Migration habitat is the access corridor through the river — the route used by upstream migrating adults and downstream migrating kelts and smolts. Upstream migration can be impaired or blocked at the mouth of the river, at shallow riffles, road crossings, dams or waterfalls. Downstream passage can be impaired by passage down or over spillways. Minimum depth of flow for upstream adult salmonid passage through culverts is one foot (NMFS 2002) and in an open channel is eight-tenths of a foot of water over a contiguous twenty five percent of the channel width (Thompson 1976). The depth of flow criteria for passage for juvenile steelhead is six-tenths of foot of water.

Table 4.4-1: Comparison of Fishery and Geomorphic Reaches

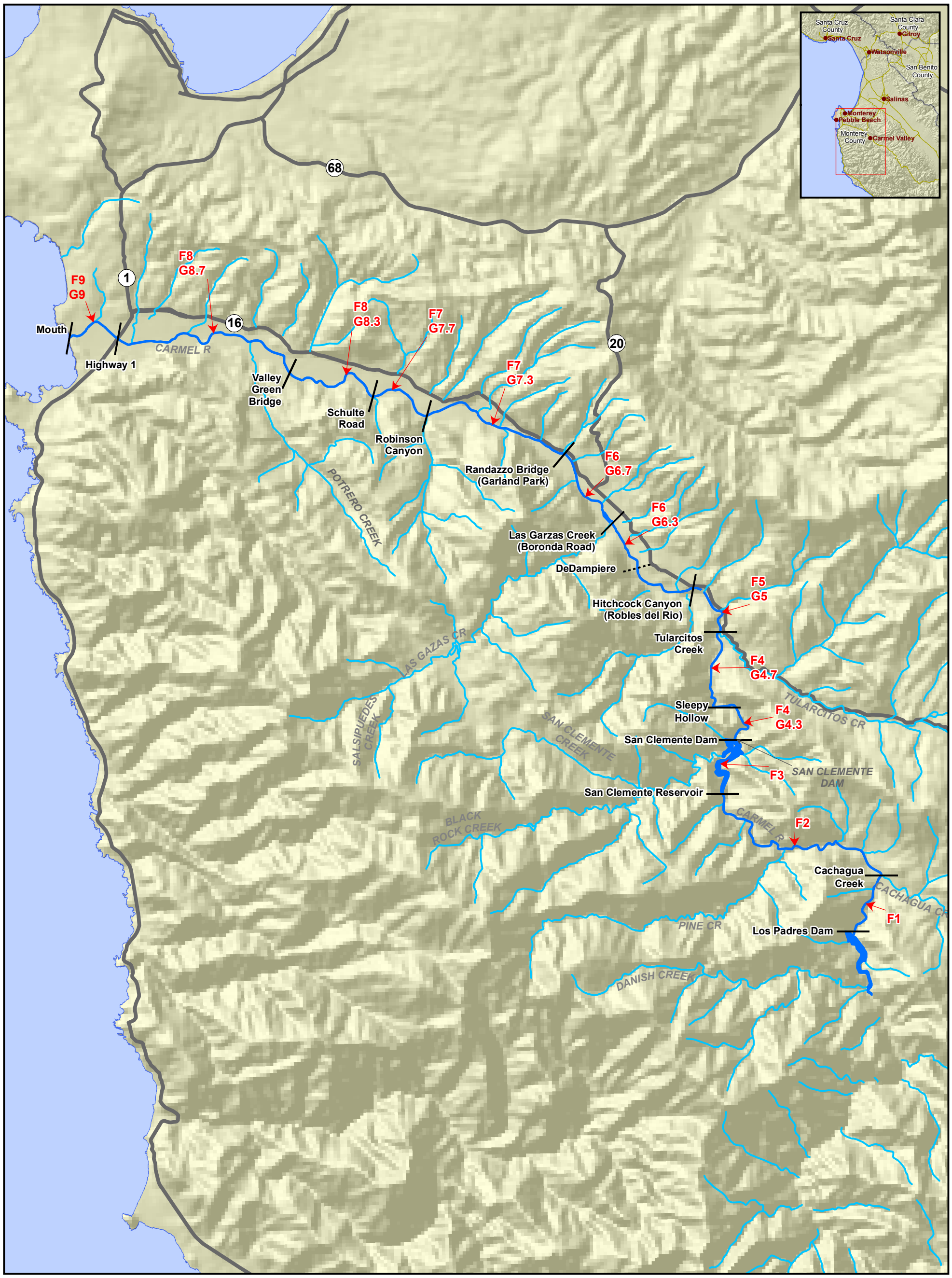
Geomorphology reach no.	Length (mi)	Fisheries reach no.	Length (mi)	Reach description**	Upstream station (River Mile)	Downstream station (River Mile)
		1	1.3	Los Padres Dam to Cachagua Creek	25.3	24
		2	4	Cachagua Creek to San Clemente Dam	24	20
		3	0.9	San Clemente Dam	20	19.1
4.3	1.7	4	3	San Clemente Dam to Sleepy Hollow	19.1	17.4
4.7	1.3			Sleepy Hollow to Tularcitos Creek	17.4	16.1
5	1.3	5	1.3	Tularcitios Creek to Hitchcock Canyon	16.1	14.8
6.3	2.2	6a, b, c*	4.6	Hitchcock Canyon** to Las Garzas Creek	14.8	12.6
6.7	2.4			Las Garzas Creek to Randazzo Bridge	12.6	10.2
7.3	2.1	7	3.5	Randazzo Bridge to Robinson Canyon	10.2	8.1
7.7	1.4			Robinson Canyon to Schulte Road	8.1	6.7
8.3	1.9	8	5.6	Schulte Road to Valley Green Bridge	6.7	4.8
8.7	3.7			Valley Green Bridge to Highway 1	4.8	1.1
9	1.1	9	1.1	Highway 1 to mouth	1.1	0
Total length	**19.1**	**Total length**	**25.3**			

NOTES:
*Fisheries reach no. 6 consists of three subreaches:
6a 1.5 Robles del Rio** to DeDampiere
6b 1.5 DeDampiere to Borondo Road
6c 1.6 Borondo Road to Garland Park

As is the case in most Central and South-Central Coast rivers, the Carmel River mouth is closed by a sandbar during the dry season (late spring through the first rains of the following winter). During dry years, all migration can be blocked at the mouth of river if the sand bar does not open, which happened in 1976 and 1977 and 1988 to 1990. When the sand bar is open and flows are less than about 45 to 60 cfs, upstream passage in the river can be impaired by shallow, wide riffles between the mouth and the Robles del Rio gage site. Several riffles have been identified in the Carmel Valley that in some years can become critical impediments to migration at low flows. These “critical riffles” change from one year to the next so they may not always present a passage problem, depending on the bed form and river flows.

Habitat Reaches

Fishery Habitat Reaches for the Carmel River are shown in Figure 4.4-1. Fishery Habitat Reaches are slightly different than geomorphic reaches. Fishery reaches extend to upstream of SCD, whereas Geomorphic Reaches are identified in the river downstream of SCD. Geomorphic reaches are divided into shorter sub-reaches in Reaches 4, 7, and 8 compared to the fish reaches. Reach 6 is divided into three subreaches for fish (6a, 6b, and 6c) and two for geomorphic assessment (6.3 and 6.7). Both reach types are shown on Figure 4.4-1 in plan view, a comparison of the two reach types in profile is provided in Figure 4.4-2 and a crosswalk table is provided in Table 4.4-1. Reach lengths are provided in Table 4.4-1.



Legend

- Carmel River Reach*
- Stream
- Highway
- Reach Break

* F9, F8, etc. = Fisheries Reaches
G9, G8.7, etc. = Geomorphology Reaches

Projection: California State Plane, Zone IV
Datum: NAD 83 Units: Feet

San Clemente Dam EIS/EIR

Figure 4.4-1

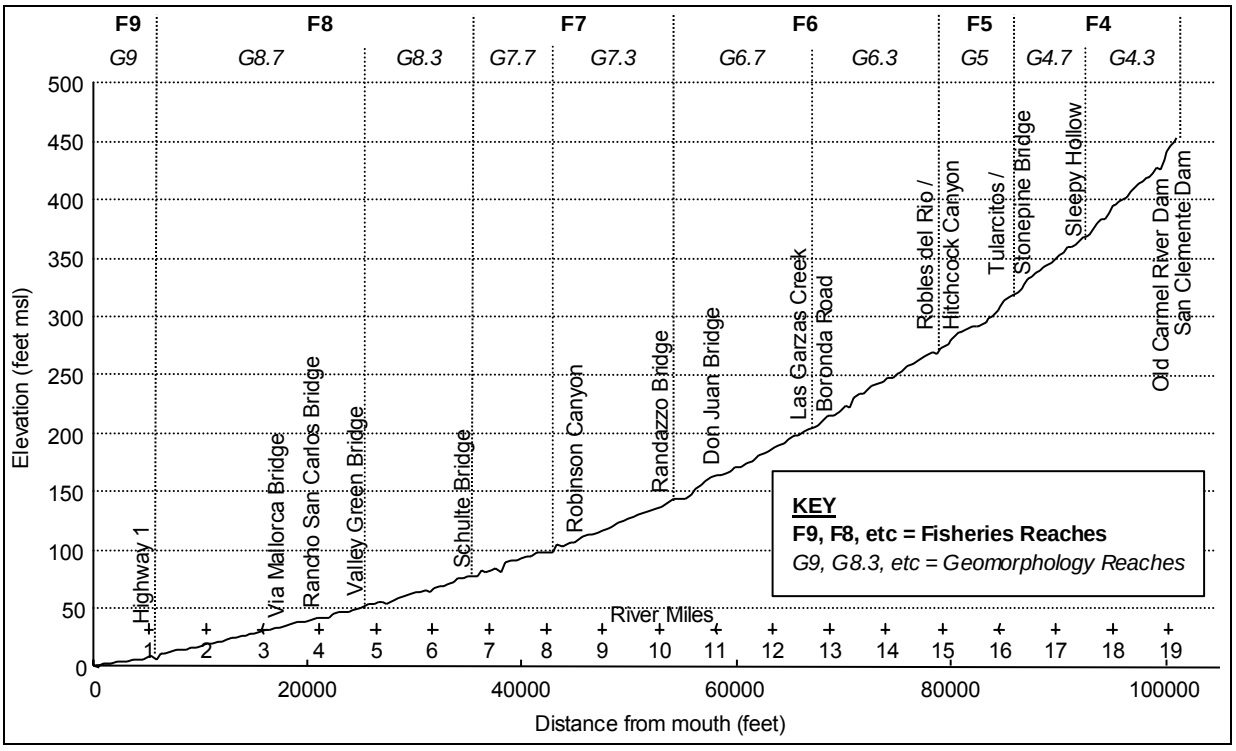
Carmel River Reach Designations

0 1 2 4 Miles

N

D:\GIS\Entrix\3018605\map\SC_ReachBreaks_17i11i_01.mxd 12/22/2005 2:30:37 PM Mukhtyar

Figure 4.4-2: Stream Profile Showing Fishery and Geomorphic Reaches



The 10 fish habitat reaches identified in the Carmel River extend from upstream of LPD to the mouth of the river. The reaches are numbered from 0 to 9 from upstream to downstream and are discussed below.

REACH 0

Reach 0 encompasses the Carmel River above LPD. Steelhead access this reach via two ladders at LPD that lead to fish traps and a truck operation that takes steelhead from the traps and transports them over the top of the Dam where they are released into the reservoir. Downstream passage occurs through the spillway. Upstream of the reservoir there are approximately ten miles of mainstem habitat above the reservoir and a total of 14.4 miles of accessible habitat in the Carmel River and its tributaries.

Habitat upstream of the reservoir provides spawning, incubation and rearing habitat. All channels are located within the Ventana Wilderness area and flows are unregulated. Deep pools, separated by short, shallow glides typify the habitat, and include long, cobble/boulder riffles and runs. Habitat modeling studies (Dettman and Kelley 1986, Dettman 1990) of Rearing Habitat (RH) were done for three sections of the river; upstream of Los Padres Reservoir (Reach 0), between LPD and the back of San Clemente Reservoir (Reaches 1 and 2) and downstream of LPD (Reaches 4, 5, 6 and 7). This study did not include Reach 3 or any of the reaches downstream of Reach 7. Based on the RH assessment, approximately 39 percent of Age 0+ and 23 percent of

Age 1+ rearing habitat for the Carmel River mainstem is located upstream of Los Padres Reservoir. The reservoir also provides some rearing habitat.

REACH 1

Reach 1 encompasses the 1.3 miles of the Carmel River from LPD to the Cachagua Creek confluence. The Carmel River in this reach is controlled by bedrock outcrops and large boulders. The reach provides a limited amount of gravel for spawning and incubation but does contain good rearing habitat. Minimum summer streamflow released from Los Padres Reservoir benefits rearing within this reach. Cachagua Creek contains about 8 miles of spawning and rearing habitat, but because of limited summer flows, only about 4 miles of seasonal rearing habitat is available during normal to wet years. Reach 1 has no barriers to migration downstream of LPD.

REACH 2

Reach 2 encompasses the four-mile stretch of river from the Cachagua Creek to the upper end of the historic extent of San Clemente Reservoir, which includes access to the Pine Creek tributary.

The Carmel River has good spawning, incubation and rearing habitat in this reach. Minimum summer streamflow released from Los Padres Reservoir benefits rearing within this reach. About 33 percent of Age 0+ and twenty percent of Age 1+ rearing habitat in the Carmel River occurs between SCD and LPD (Reaches 1 and 2). Reach 2 has no barriers to migration.

REACH 3

Reach 3 is the area that was originally inundated by San Clemente Reservoir. The reservoir now is filled with sediment through which the Carmel River has reestablished about 0.9 mile of channel. Good quality habitat has developed in the channel along its flood plain to within about 1,400 feet of the Dam. This part of the river supports steelhead spawning, incubation, rearing and migration. The lower 1,200 feet of channel is mostly a sand bed channel and supports some rearing habitat. The small reservoir that remains supports some rearing. Upstream migration occurs via a fish ladder at SCD. The fish ladder rises about 68 feet through a series of 28 pools and weirs. Downstream migration occurs over the spillway or via the ladder when the reservoir is spilling, but only via the ladder when the reservoir is not spilling. During the Annual Drawdown for Interim Seismic Safety Measures, downstream migration can occur through a fish bypass system into the ladder and upstream migration is not possible. The ladder is not operable at any time the reservoir is near or below the invert elevation of the fish ladder (524.5 feet). San Clemente Creek, flows into the reservoir and provides access to about 5 miles of tributary channels that provides spawning, incubation and rearing habitat.

Existing stream channels within the former inundation area of the reservoir will continue to evolve as sediments are deposited and reworked by fluvial processes and riparian

vegetation becomes established and develops. Carmel River aquatic habitat conditions are good along the upper 3,200 feet of this reach and poor along the lower 1,200 feet. In 2005, open water habitat in the reservoir covered about 100 to 200 feet of the former Carmel River channel and about 850 feet of the former San Clemente Creek channel.

REACH 4

Reach 4 encompasses a three mile stretch of river from SCD to the confluence of Tularcitos Creek. The river has no tributaries in this reach and is confined in a rocky, steep-sided canyon. The river is bordered by a thin strip of riparian vegetation, primarily comprised of alders with an occasional large sycamore, willow, or cottonwood tree. From SCD downstream to Tularcitos Creek, the river is armored with cobble and boulder-sized materials. This reach supports rearing and migration but is nearly devoid of any spawning habitat because of sediment storage behind SCD. Two partial passage barriers occur in Reach 4 downstream of SCD. The OCRD is located about 0.34 mile downstream of SCD in Reach 4. Migration occurs past OCRD through a gate that has been permanently opened on the east side of the Dam. Flow from the gate can be obscured during moderate flows of about 800 to 900 cfs when spill over the entire crest of OCRD occurs. Migration may be delayed when fish attempt to jump the Dam instead of swim through the gate. Adult steelhead that successfully jump the Dam enter a very high velocity flow at the Dam crest and can be swept back downstream. At a few hundred cfs, another partial passage barrier can develop in the culverts and over the road crossing at the Sleepy Hollow Ford. During flows in this range velocities in the culverts can be too high to support upstream passage and flows over the roadway can to be too fast and shallow for easy upstream passage. The Sleepy Hollow Ford is located about 0.9 mile downstream of SCD. The Sleepy Hollow Steelhead Rearing Facility (SHSRF) is located just downstream of the Sleepy Hollow Ford within Reach 4. The SHSRF is used to rear juvenile steelhead rescued from the lower Carmel River and tributaries. Rescues are required when surface flow declines or ceases during the dry season and strands juvenile fish in isolated pools or stream sections. Rescues are required in most years.

REACH 5

Reach 5 encompasses the 1.4-mile section from the Tularcitos Creek confluence down to Robles del Rio and includes two tributaries; Tularcitos and Hitchcock creeks. Tularcitos Creek supports some spawning and rearing. Hitchcock Creek is a seasonal tributary and supports some spawning, incubation and early fry rearing in wet years. The river is still confined in a rocky canyon, but it is wider and less confined than Reach 4. The substrate is primarily cobble, gravel, and sand. Residential encroachment has affected bank conditions and associated habitat along this reach from about Camp Stephani downstream to Robles del Rio. This reach supports spawning, incubation, rearing and migration.

REACH 6

Reach 6 encompasses 4.4 miles of the Carmel River from Robles del Rio down to the Scarlett Narrows. Downstream of Robles del Rio the Carmel River is an alluvial river flowing between terraces and in an active floodplain. This reach has a wide channel bordered by riparian vegetation. Numerous houses exist along the banks of the river and on the terraces. This reach supports spawning, incubation, rearing and migration. During dry years, a short section at the downstream end of Subreach 6a can go dry. A potential barrier to fish passage exists within Subreach 6b upstream of Boronda Road where a critical riffle occurs. The tributary of Las Garzas Creek joins the Carmel River at RM 8.7 and supports about two to three miles of spawning and incubation habitat but provides only limited rearing habitat because of the seasonal nature of streamflow in this tributary.

About 28 percent of Age 0+ and 23 percent of Age 1+ rearing habitat in the Carmel River occurs downstream of SCD in reaches 4, 5, and 6 (Dettman and Kelley 1986, Dettman 1990). About 41 percent of the spawning habitat in the mainstem Carmel River occurs downstream of SCD (Dettman 1990).

REACH 7

Reach 7 encompasses the 3.4-mile stretch from the Narrows down to the Schulte Road Bridge. Robinson Creek is the main tributary in this reach. The Carmel River in this reach is an alluvial river with a bed comprised of cobble, gravel, and sand. The channel is bordered for the most part with healthy stands of riparian vegetation. This reach supports spawning, incubation, rearing and migration habitat. In years with limited rainfall, this reach can dry back as far upstream as the confluence with Robinson Canyon Creek. Only about a mile of Robinson Canyon Creek supports steelhead spawning, incubation and some rearing.

REACH 8

Reach 8 extends for 2.4 miles from the Schulte Road Bridge to Highway 1. Potrero Creek is the main tributary to this reach. The river valley in this reach is wide, the channel is incised in old terraces, and banks are often lined with rip-rap. Houses, golf courses, and agriculture border the channel. The streambed is comprised primarily of sand and provides very limited spawning and incubation habitat. Some rearing can occur in the upper portion of this reach throughout the summer months during wet years. During dry water years, this reach can completely dry up. The reach does support migration during the winter period. Potrero Creek has limited habitat for spawning, incubation and rearing habitat that is limited to a maximum of about 1.5 miles of channel upstream from the golf course.

REACH 9

Reach 9 is the 1.1-mile section of stream channel and lagoon downstream of State Highway 1 and extending to the mouth of the Carmel River. There are no tributaries in

this reach. This reach is bordered on both sides by levees, contains a sand bed and does not support spawning or incubation. Recent work along the Carmel River for restoration of the lagoon and wetland has removed some of the levees along the south bank downstream of Highway 1. Rearing habitat is limited by available surface water in the flowing channel. Most rearing is confined to the lagoon except in very wet years when flows persist through the summer. Rearing within the lagoon occurs in all years, primarily for 1+ and older juveniles. In some years the lagoon can provide very important rearing habitat for the Carmel River watershed. The primary importance of this reach is the critical role of lagoon habitat for juveniles and smolts.

Adult access into the river is determined by the status of the river mouth during the migration season (January through May). Typically, the first storms of the year will open the sandbar at the mouth of the river by mid-December, and continuing storms or subsequent streamflow will keep the mouth open into May or June. The mouth closes when average daily flows fall below about 20 cfs.

4.4.1.3 Status of Carmel River Steelhead

Concern over the ongoing decline in steelhead numbers has lead to protective measures directed at controlling the harvest of adults, providing suitable spawning grounds, and maintaining rearing habitat for juvenile steelhead. The CDFG has expressed concern for many years that the steelhead population in the Carmel River is threatened with becoming a remnant run due to the development of water resources, drought, and watershed, land use, and environmental problems (CDFG 1986, Snider 1983). CDFG's policy and goal for managing the steelhead resource is to "maintain it as a self-sustaining resource and to restore it as much as possible to its historic level of productivity" (McEwan and Jackson 1996).

NMFS 1996 status review of west coast steelhead populations (Busby et al. 1996) and NMFS final rule under the federal ESA (August, 1997) identified 15 population units of steelhead, called Evolutionarily Significant Units (ESUs)[1]. The Carmel River is within the South-Central California Coast (SCCC) ESU, which is designated as threatened. This DPS includes all naturally spawned fish (and their progeny) in streams below impassable barriers, from the Pajaro River (inclusive) in Santa Cruz County to (but not including) the Santa Maria River in southern San Luis Obispo County. The designated Critical Habitat for steelhead in the Carmel River (Federal Register September 2, 2005) includes all accessible reaches of the river including areas upstream of LPD where a trap and truck operation has occurred since 1949.

The Carmel River supports the largest run of about 27 anadromous streams within the SCCC DPS. Many of the streams in the SCCC DPS are short and occupy smaller watersheds compared to the Carmel River. The Carmel River is the only river within the DPS that has long-term data on adult returns and juvenile abundance. Run sizes in

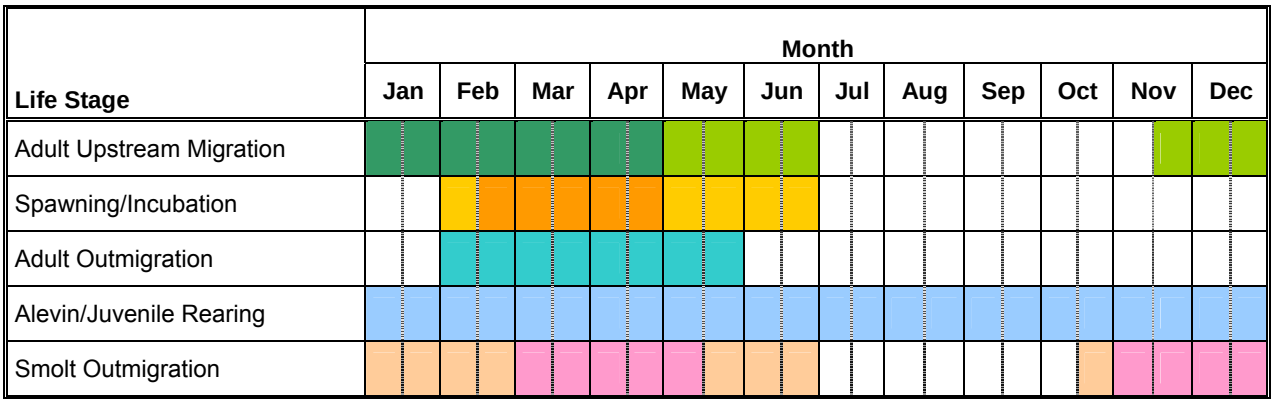
[1] ESUs for west coast steelhead are currently referenced as Distinct Population Segments (DPS). DPS is utilized for the remainder of this EIR/EIS while discussing steelhead populations.

most of the other creeks in this DPS are undocumented but estimated to be in the low hundreds or less compared to counts at SCD that range from the low to high hundreds. The fish counts at SCD do not include steelhead that spawn in the lower Carmel River or its tributaries. Consequently, the Carmel River supports an important population component of the SCCC DPS.

4.4.1.4 Steelhead Life Cycle in the Carmel River

Steelhead are anadromous fish; adults living in the ocean migrate to freshwater for spawning (Barnhart, 1986). Key elements of the steelhead life cycle are tied to the wet and dry seasons and are presented in Figure 4.4-3.

Figure 4.4-3: Occurrence of Steelhead Life Stages in the Carmel River



Darker colors in a single row indicates high activity periods

Spawning and Incubation

In the Carmel River Basin, adults have been observed spawning from February through March, but they probably spawn from mid-January to late April (Dettman and Kelley 1986). The embryos incubate three to eight weeks (longer incubations are associated with lower temperatures) and hatch as alevins in late winter or spring (February through May). The newly hatched alevins reside in the gravel up to two weeks, then emerge as fry and disperse into low velocity areas along stream margins.

Rearing

Steelhead fry grow rapidly through the spring and early summer. Most juvenile steelhead in the Carmel River remain in freshwater for two years before migrating to sea as 8 to 10-inch sized fish. A few individuals may have a freshwater residency of three or four years, as indicated by observations of larger juvenile steelhead in the lower Carmel (Dettman and Kelley 1986) and in nearby Waddell Creek (Shapovalov and Taft 1954). Some steelhead may never go to sea and will mature and spawn in freshwater.

Smolts

Juveniles generally become smolts after they reach about 8 inches in size usually near the end of their second year in freshwater. Smolts migrate downstream during peak periods coincident with large flow events in winter and spring and during the March to May smolt out-migration period. Some smolts may move downstream in all months of year but smolts that don't reach salt water will revert back to their freshwater form as juveniles (called residualized steelhead). These fish may smolt again at some future time when migration conditions to the lagoon or ocean improve. Once in the ocean, smolts will develop into mature adults and return to the river to reproduce one to three years after entering the ocean.

Kelts

Kelts can migrate back downstream and reenter the ocean from February through mid-April. Kelts can also hold over in the river or lagoon until the mouth reopens the following winter. An estimated 15 to 20 percent of adults sampled at the Los Padres fish trap or from anglers were adults that had spawned previously based on a scale analysis collected during the early to mid 1980's (unpublished data, D. Dettman, MPWMD pers. comm. as cited in RDEIR 2000 (Denise Duffy & Associates 2000). The percent of repeat spawners in the Carmel River is relatively consistent with nearby Waddell Creek which had an average of 17.2 percent repeat spawners (15 percent second-time spawners, 2.1 percent third-time and 0.1 percent fourth-time) over a ten-year period (Shapovalov and Taft 1954).

4.4.1.5 Steelhead Trends in the Carmel River

Trends in Adult Abundance

Adult steelhead have been counted in the SCD fish ladder from 1962 to 2005. Adult fish that spawn in the mainstem or tributaries downstream of SCD are not counted. From 1962 to about 1993 ladder counts were made by turning down the flow in the ladder and having an employee of CAW walk along the edge of the ladder and count the fish in the pools. This was done once in the morning and once in the evening and the two counts were added for the daily ladder count. A mechanical counter was used in 1974, 1975, and 1984. An electromechanical counter has been in use since 1994. No evaluation comparing the different counting methods was ever conducted. However, review of data collected by the electromechanical counter suggests that most steelhead move upstream through the ladder during daylight hours and the time it takes to move up the ladder is about 4 to 8 hours, suggesting that the summed twice daily visual counts may be good approximation of the electromechanical counts.

Visual counts could underestimate actual abundance when water is turbid during runoff events or during inclement weather when walking the ladder is particularly dangerous, or if counts were not made on weekends and holidays that were coincident with migration peaks. Visual counts should not be compared directly to total counts tallied by the electromechanical counter.

No counts were made in 1978 to 1983 and 1985 to 1987. Counts of anadromous steelhead for 1976, 1977, and 1988 to 1990 are assumed to be zero since the mouth of the river was not open to the ocean during these winters. During severe or extended droughts, winter flows are absent or inadequate to open the sandbar that closes the mouth between the river and the ocean. During these years, resident trout can move upstream through the ladder.

Adult steelhead runs (as indexed by visual ladder counts at SCD), have ranged from about 300 to 1,400 adults from 1962 to the mid-1970's. Since 1994, total counts at the SCD ladder have ranged from about 300 to 800 adults (Figure 4.4-4). Indices of the runs since the 1976 to 1977 drought have been 30 to 50 percent lower compared to indices made between 1962 and 1975. These reduced numbers are consistent with dramatic physical changes to habitat conditions in the Carmel River through Carmel Valley that occurred during the 1978 floods on the heels of the 1976 to 1977 drought (Kondolf and Curry 1984).

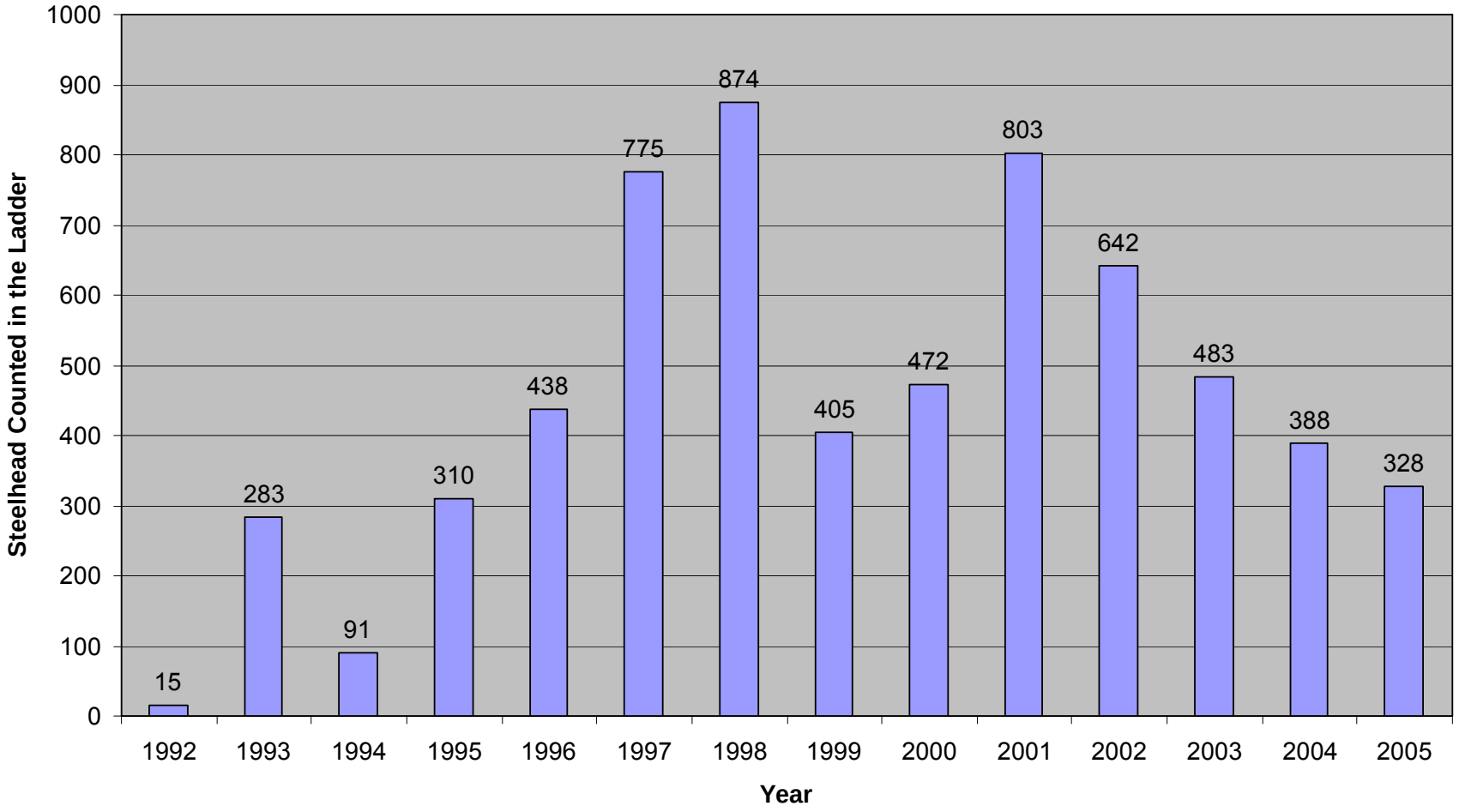
Since the end of the most recent drought in 1991, the run has varied from between 15 to 874 adults. Runs from 1992 to 1994 were recovering following river mouth closure from 1988 to 1990 and very low flow conditions and low juvenile abundance in 1992 and 1994 (Figure 4.4-5). The run increased through 1998, declined to 400 to 500 fish in 1999 and 2000, increased to over 800 fish in 2001 and then declined to about 384 fish in 2005 (Figure 4.4-4).

All adult counts have occurred at SCD located at RM 19.1. The number and proportion of adult steelhead that spawn in the lower river is unknown. A single study estimated that 55 percent of the total run migrated past SCD, but this estimate did not account for potential harvest (at the time) or nondetection of tagged fish between the lower river and the upper river recovery sites (Dettman and Kellog 1986). Data from the LPD trap and truck counts suggest year-to-year high variation in the proportion of the run that passed SCD. Counts at the LPD averaged about 30 percent of the counts at SCD with a range of 10 to 50 percent between 1992 and 2005.

ADULT RUN TIMING

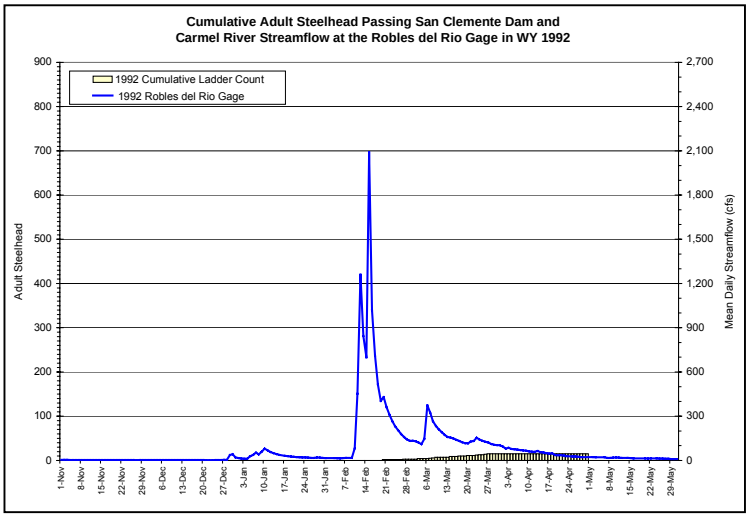
The timing and duration of the run depends on several factors, including the timing and intensity of storms, the type of water year, and the number of fish running in any given migration year. In low flow years with small runs, such as 1992 and 1994, adults entered the river from February through late March. More typically, the majority of adults enter the river from early January through mid-April. In years when storms are early, adults may begin their upstream migration in late November. The first storms of the season and the first opening of the mouth of the river control the initial upstream migration. The end of the migration period depends more on the size of the run, with larger runs extending into May or June.

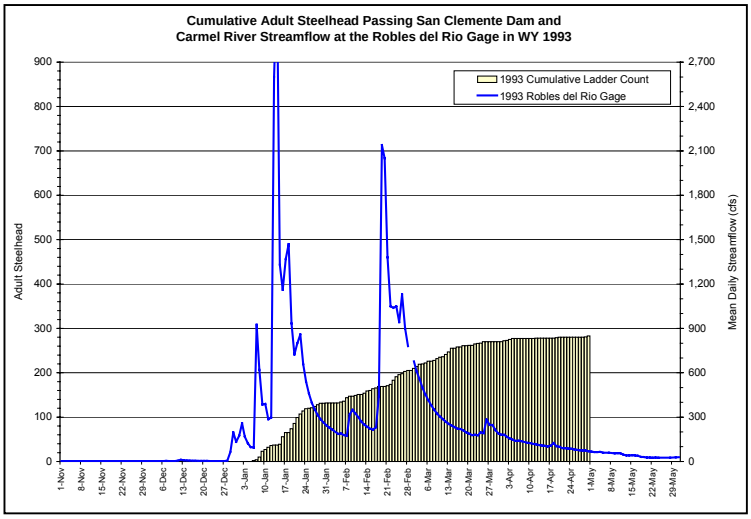
Figure 4.4-4: Total Adult Steelhead Counts at San Clemente Dam 1992-2005



Source: MPWMD 1998 upstated with from MPWMD wewbsite accessed 18, 2005)

Figure 4.4.5: Timing of Migrations and River Flows (1992 — 2005)





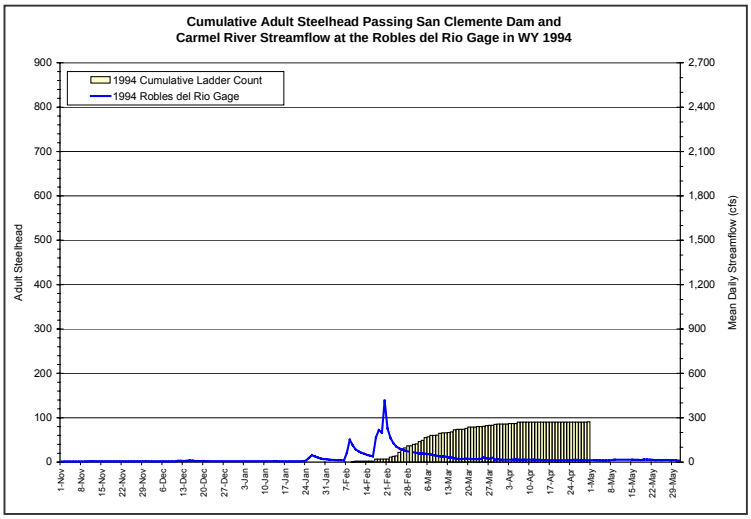
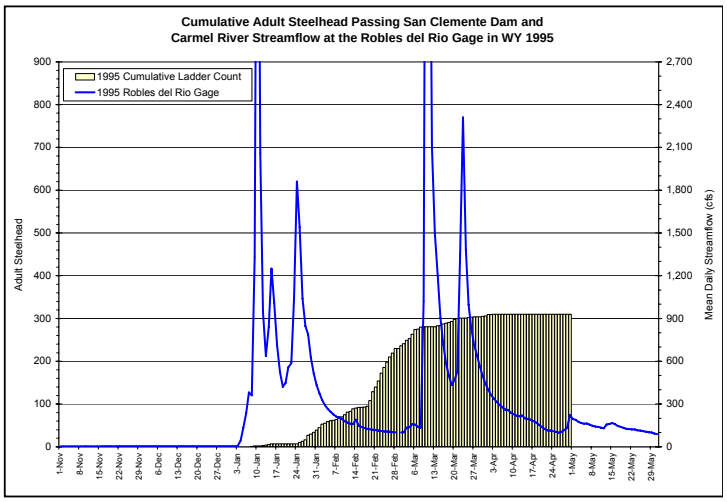
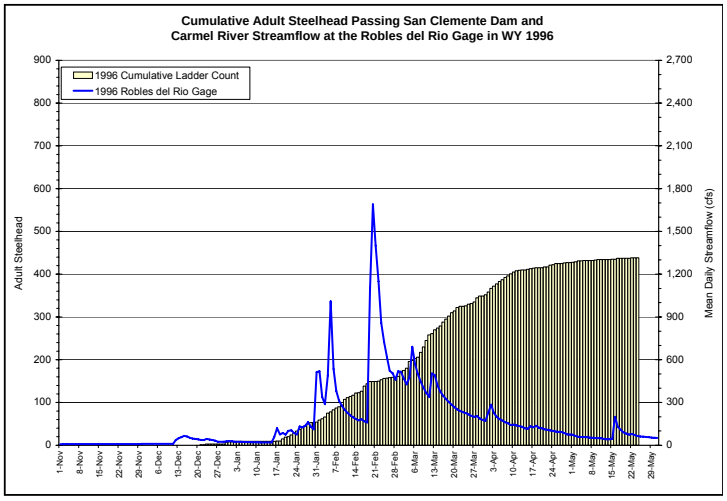


Figure 4.4-5: Timing of Migrations and River Flows (1992 — 2005) continued





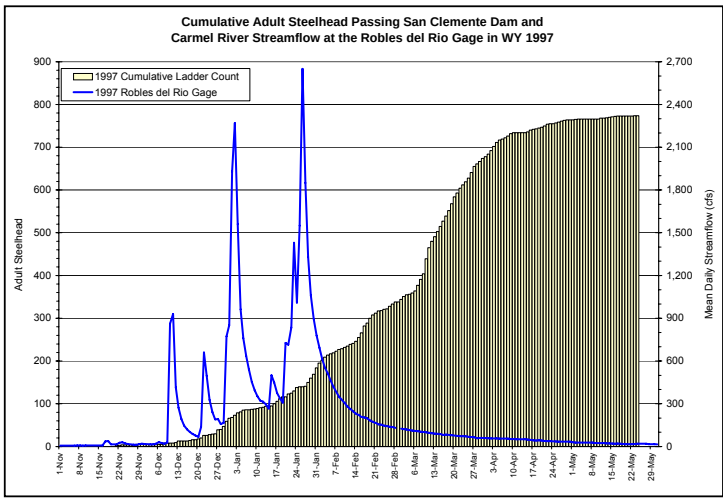
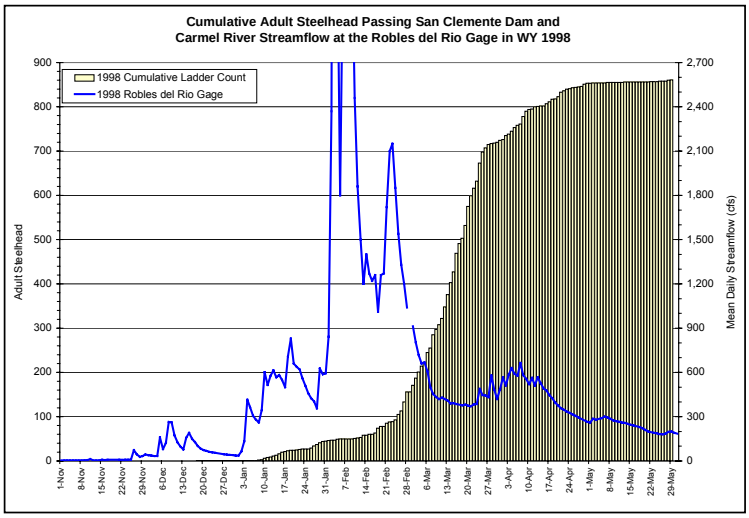
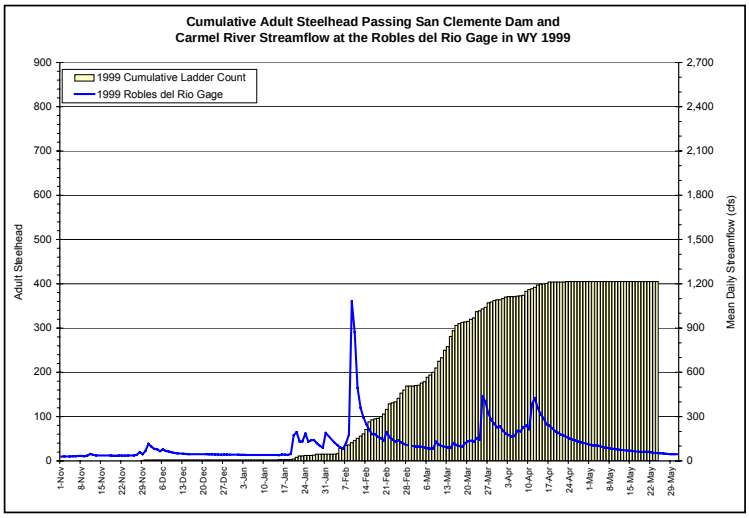


Figure 4.4-5: Timing of Migrations and River Flows (1992 — 2005) continued





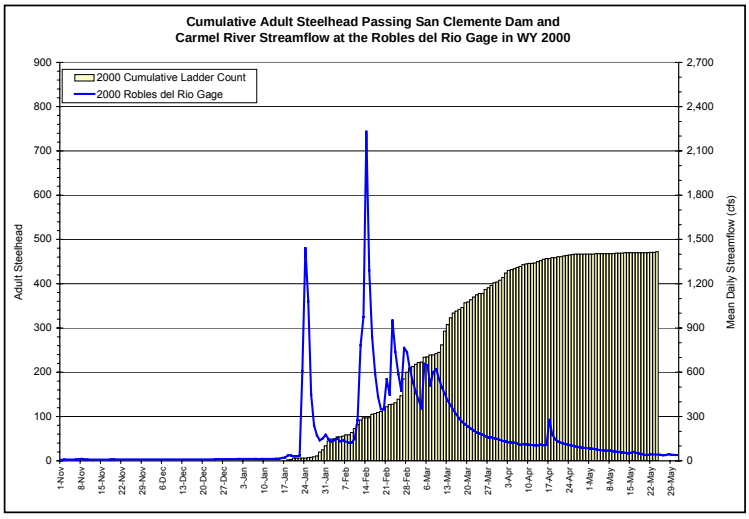
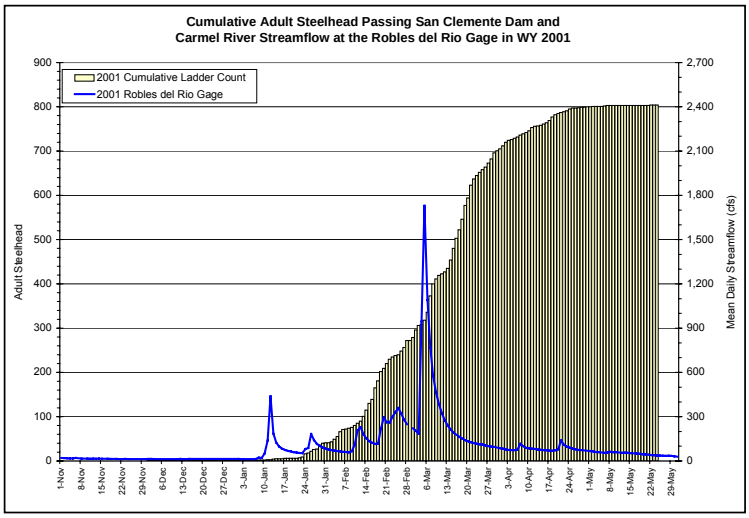
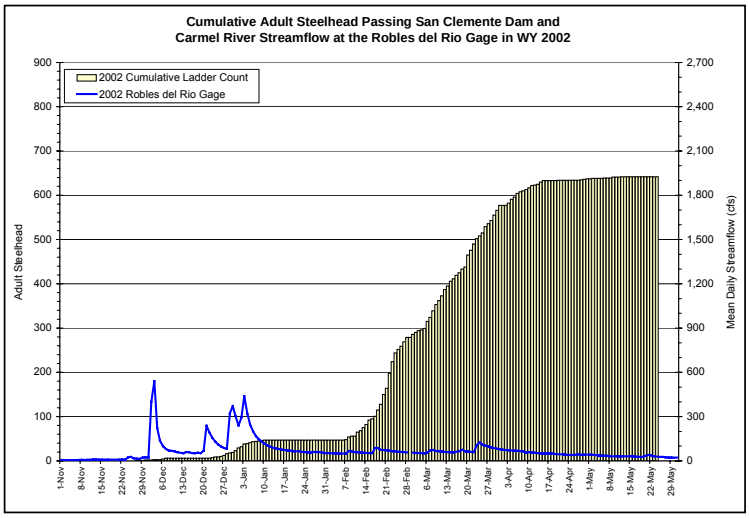


Figure 4.4-5: Timing of Migrations and River Flows (1992 — 2005) continued





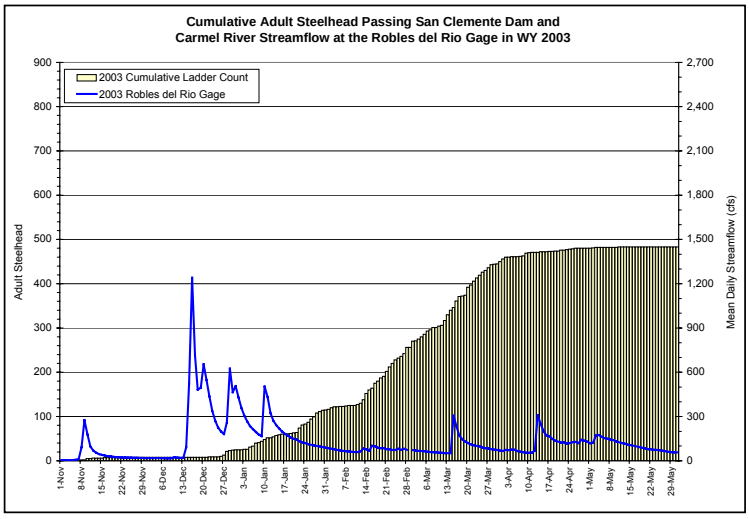


Figure 4.4-5: Timing of Migrations and River Flows (1992 — 2005) continued

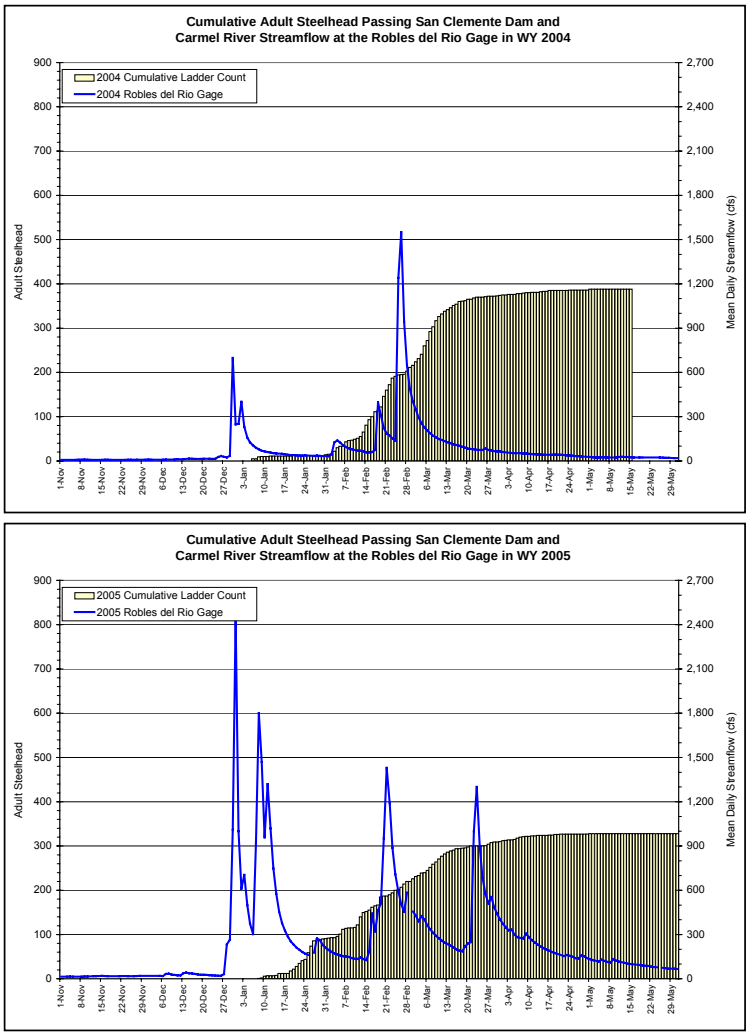


Table 4.4-2 shows biweekly fish counts and percent of the counted run at SCD for 1992 to 2005. Approximately 98 percent of the run as counted at the ladder had occurred between January 1 and April 30 for the 14 years of record. However, operation of the MPWMD fish counter was terminated on April 30 in all years before 1996 at the time flashboards were installed in SCD and the ladder was closed. This was standard operation prior to 1996. The counter has usually been closed down by May 30 most years and a few fish may move upstream after counter operation is suspended in some of the years. The migration appears to mostly over by the end of May and this is supported by a long-term study on a Central California Coastal DPS stream. Shapovalov and Taft (1954) trapped 96 percent of upstream moving adults between December 3 and May 5 for nine years in Waddell Creek, Santa Cruz County and in only one year were adult steelhead counted after May.

At SCD for the 1992 to 2005 counts, note that in most years a few fish probably ran before the counter was activated or after it was shut down and would not have been counted. Therefore the total count is biased slightly low for fish passing SCD. The "percent of the run" in Table 4.4-2 is relative to the number of fish counted at SCD and does not include the few fish that may have moved past the Dam before or after the counter was operating. The "percent of the run" also ignores any of the steelhead that spawn in about 12 miles of the lower river or its tributaries. The timing of the 1992 to 2005 migrations is graphically represented along with river flows in Figure 4.4-5. The same considerations that apply to Table 4.4-2 should be applied to the interpretation of Figure 4.4-5. This document defines the migration season in the Carmel River as January 1 through May 31 (January through May) acknowledging that an early onset of winter storms can advance the start of the migration in some years into late December, and that wet years with large runs can extend the migration season in some years into June.

Trends in Juvenile Abundance

Juvenile steelhead are found throughout the river system year-round including the mainstem river and tributaries that contain year-round surface water. Seasonal tributary streams can support spawning, incubation and early fry rearing into the spring or early summer, but young fish then must move to permanent water.

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Table 4.4-2: Summary of Adult Run Timing for Water Years 1992-2005 Based on Steelhead Counted at San Clemente Dam

	Lagoon Opened		Nov-1 to Nov-15	Nov-16 to Nov-30	Dec-1 to Dec-15	Dec-16 to Dec-31	Jan 1 to Jan 15	Jan-16 to Jan-31	Feb-1 to Feb-14	Feb-15 to Feb-28(29)	Mar-1 to Mar-15	Mar-16 to Mar-31	Apr-1 to Apr-15	Apr-16 to Apr-30	May-1 to May-15	May-16 to May-31	Jun-1 to Jun-15	Jun-15 to Jun-30	TOTAL
WY 1992	11-Feb	Fish	*Fish Counter Started 1/1*				0	0	0	3	6	6	0	0	*Ladder Closed 4/30*				15
		% Run					0.0%	0.0%	0.0%	20.0%	40.0%	40.0%	0.0%	0.0%					
WY 1993	3-Jan	Fish	*Fish Counter Started 1/1*				39	93	27	46	50	15	8	5	*Ladder Closed 4/30*				283
		% Run					13.8%	32.9%	9.5%	16.3%	17.7%	5.3%	2.8%	1.8%					
WY 1994	17-Feb	Fish	*Fish Counter Started 2/1*						2	35	36	13	4	1	*Ladder Closed 4/30*				91
		% Run							2.2%	38.5%	39.6%	14.3%	4.4%	1.1%					
WY 1995	9-Jan	Fish	*Fish Counter Started 1/3*				7	32	52	139	54	22	4	0	*Ladder Closed 4/30*				310
		% Run					2.3%	10.3%	16.8%	44.8%	17.4%	7.1%	1.3%	0.0%					
WY 1996	13-Dec	Fish	*Fish Counter Started 11/27*		0	8	1	45	68	39	118	73	59	16	8	3	*Counter Stopped 5/24*		438
		% Run			0.0%	1.8%	0.2%	10.3%	15.5%	8.9%	26.9%	16.7%	13.5%	3.7%	1.8%	0.7%			
WY 1997	6-Dec	Fish	*Started 11/14*	5	8	53	29	89	62	92	177	163	58	28	7	4	*Counter Stopped 5/24*		775
		% Run		0.6%	1.0%	6.8%	3.7%	11.5%	8.0%	11.9%	22.8%	21.0%	7.5%	3.6%	0.9%	0.5%			
WY 1998	3-Jan	Fish	*Fish Counter Started 12/2*		0	1	15	29	13	98	271	297	78	51	3	5	5	8	874
		% Run			0.0%	0.1%	1.7%	3.3%	1.5%	11.2%	31.0%	34.0%	8.9%	5.8%	0.3%	0.6%	0.6%	0.9%	
WY 1999	3-Nov	Fish	*Started 11/28*	2	0	0	1	12	56	98	125	70	36	5	0	0	*Counter Stopped 5/24*		405
		% Run		0.5%	0.0%	0.0%	0.2%	3.0%	13.8%	24.2%	30.9%	17.3%	8.9%	1.2%	0.0%	0.0%			
WY 2000	23-Jan	Fish	*Fish Counter Started 12/8*		0	0	0	34	63	113	124	74	47	12	3	2	*Counter Stopped 5/24*		472
		% Run			0.0%	0.0%	0.0%	7.2%	13.3%	23.9%	26.3%	15.7%	10.0%	2.5%	0.6%	0.4%			
WY 2001	11-Jan	Fish	*Started 11/28*	0	2	0	3	36	74	157	208	225	56	39	3	1	*Counter Stopped 5/24*		804
		% Run		0.0%	0.2%	0.0%	0.4%	4.5%	9.2%	19.5%	25.9%	28.0%	7.0%	4.9%	0.4%	0.1%			
WY 2002	3-Dec	Fish	*Started 11/1*	2	4	17	24	0	35	197	132	166	56	4	5	0	*Counter Stopped 5/24*		642
		% Run		0.3%	0.6%	2.6%	3.7%	0.0%	5.5%	30.7%	20.6%	25.9%	8.7%	0.6%	0.8%	0.0%			
WY 2003	15-Dec	Fish	6	2	0	17	34	56	37	104	90	104	22	8	3	0	*Counter Stopped 5/31*		483
		% Run	1.2%	0.4%	0.0%	3.5%	7.0%	11.6%	7.7%	21.5%	18.6%	21.5%	4.6%	1.7%	0.6%	0.0%			
WY 2004	30-Dec	Fish	*Fish Counter Started 1/1*				11	3	67	130	140	23	9	3	2	*Counter Stopped 5/5*			388
		% Run					2.8%	0.8%	17.3%	33.5%	36.1%	5.9%	2.3%	0.8%	0.5%				
WY 2005	30-Dec	Fish	*Fish Counter Started 1/1*				12	79	61	68	71	19	14	3	1	0	*Counter Stopped 5/31*		328
		% Run					3.7%	24.1%	18.6%	20.7%	21.6%	5.8%	4.3%	0.9%	0.3%	0.0%			
AVERAGE		Fish	0.4	0.8	1.0	6.9	12.6	36.3	44.1	94.2	114.4	90.7	32.2	12.5	2.5	1.1	0.4	0.6	450.6
		% Run	0.1%	0.1%	0.1%	1.1%	2.8%	8.5%	9.9%	23.3%	26.8%	18.5%	6.0%	2.0%	0.5%	0.2%	0.0%	0.1%	

Juvenile population data were collected sporadically in the Carmel River system prior to 1990. In 1973 and 1974 juvenile abundance data primarily was collected upstream of SCD because limited surface flows in the lower river provided only about 10 percent of the available rearing habitat for the entire river. A few efforts to collect juvenile abundance data occurred during the 1980s. Since 1990, MPWMD has been collecting annual juvenile abundance data in the Carmel River, eventually establishing eight stations in the 15 miles between Robinson Canyon Road Bridge and LPD. In 2002, two sampling sites were added in Reach 3 upstream of SCD. Table 4.4-3 displays juvenile steelhead densities (in number of steelhead per foot of channel) for each reach. The table shows average densities (in number of fish per foot of channel and fish per mile) for each year from 1994 to 2004 in the right two columns and by reach in the lower two rows.

Estimates of juvenile steelhead abundance in the mainstem Carmel River downstream of LPD is estimated by multiplying the steelhead reach density by the length of the reach (in feet) and summing the reaches. Reach 9 goes dry in most years and does not support any rearing, except for the lagoon, which can support thousands of steelhead but is not included in the comparison because there are no long-term data. Reach 8 dries back in most years and abundance estimates are based on its minimum estimated flowing length for each year (refer to Figures 4.4-1 and 4.4-2 and Table 4.4-1 for Reach locations and descriptions). The same approach is used in years when dry back extends into Reach 7 (in years when Reach 8 goes completely dry it supports no fish and abundance for Reach 7 would be based on its minimum flowing length).

Juvenile abundance by reach and year for the mainstem Carmel River downstream of LPD is shown in Figure 4.4-6, these data show the relatively low abundance during the end of the drought from 1990 to 1992 then a relatively consistent level of abundance between 1993 and 1999 and in 2001, 2002 and, 2004 ranging from about 50,000 to 100,000 juveniles. Juvenile abundance increased in 2000 to over 170,000 juveniles and in 2003 to over 120,000 juveniles. No consistent sampling has occurred upstream of LPD.

Table 4.4-4 shows average densities of juvenile steelhead collected during late summer or fall from sites in the Carmel River for the years 1973 to1974, 1983, 1985 to 1987, and from 1990 to 2004. Data obtained before 1983 includes mainstem and tributary sites as well as sites in the Carmel River upstream of Los Padres Reservoir. Data since 1990 has been collected from the mainstem Carmel River from LPD downstream. These data sets show that average fish densities for years when sites were sampled upstream of LPD in 1973 and 1974 in the Carmel River and from only lower river sites in 1983 and 1985 to 1987 are comparable to the lower river sites for the years 1990 to 2004 compared to the much lower densities that occurred during the 1987 to 1992 drought.

Table 4.4-3: Carmel River Juvenile Steelhead Density 1990-2004 by River Reach[1]

Lineal Population Density at Survey Stations (numbers per foot of stream) [3, 4]												**Overall Annual Average**		**Average [2] 1994-on Comparison**	
	Lower River Sites	Scarlett Narrows	Garland Park	Boronda	DeDamp. Park	Stonepine Resort	Sleepy Hollow	SCR Delta Lower Station	SCR Delta Upper Station	Los Compadres	Cachagua				
YEAR	RM 5.8	RM 8.7	RM 10.8	RM 12.7	RM 13.7	RM 15.8	RM 17.5	RM 19.0	RM 19.6	RM 20.7	RM 24.7	**(nos./ft)**	**(nos./mi)**	**(nos./ft)**	**(nos./mi)**
1990	0	0	0	0	0	0.50	0.27			0.26	0.22	**0.14**	**733**	--	--
1991	0	0	ND	0.12	0	0.74	0.39			0.09	0.62	**0.25**	**1,294**	--	--
1992	ND	ND	0.67	0.36	ND	0.96	0.30			0.40	0.83	**0.59**	**3,098**	--	--
1993	ND	0.62	0.91	0.92	0.82	0.84	0.52			1.22	1.84	**0.96**	**5,075**	**0.96**	**5,075**
1994	ND	0.44	0.23	0.43	0	0.50	0.29			1.51	0.71	**0.51**	**2,713**	**0.51**	**2,713**
1995	0.49	0.65	1.01	1.61	ND	1.42	0.69			0.50	1.63	**1.00**	**5,281**	**1.07**	**5,666**
1996	0.24	1.52	0.82	1.05	2.03	1.22	0.29			0.95	1.92	**1.12**	**5,890**	**1.23**	**6,468**
1997	0.02	0.22	1.02	1.74	1.15	0.5	0.22			1.15	1.41	**0.83**	**4,359**	**0.93**	**4,891**
1998	0.19	0.30	0.67	0.34	1.50	0.27	0.60			0.54	2.24	**0.74**	**3,901**	**0.81**	**4,264**
1999	0.17	0.26	0.50	0.32	0.62	1.67	0.45			0.46	1.35	**0.64**	**3,403**	**0.70**	**3,716**
2000	0.91	1.03	0.64	1.38	5.66	1.71	1.46			1.41	2.3	**1.83**	**9,680**	**1.95**	**10,289**
2001	ND	0.48	0.35	0.63	0.68	1.08	0.32			0.47	1.62	**0.70**	**3,716**	**0.70**	**3,716**
2002	ND	0.68	0.85	1.67	0.83	1.07	0.5	0.33	0.68	1.52	2.73	**1.09**	**5,734**	**1.09**	**5,734**
2003	1.53	0.82	2.16	1.86	1.45	1.55	1.23	0.58	1.09	1.69	2.16	**1.47**	**7,738**	**1.46**	**7,704**
2004	0.25	0.46	0.78	1.21	0.43	1.24	0.55	0.58	0.41	0.45	0.89	**0.66**	**3,480**	**0.70**	**3,696**
Station Ave (no./ft)	**0.38**	**0.53**	**0.76**	**0.91**	**1.17**	**1.02**	**0.54**	**0.50**	**0.73**	**0.84**	**1.50**	**0.83**	**4,406**	**1.01**	**5,328**
Station Ave (no./mile)	**2,006**	**2,822**	**4,001**	**4,801**	**6,161**	**5,375**	**2,844**	**2,622**	**3,837**	**4,442**	**7,909**				
Overall Station Averages:												**0.81**	**4,257**		

Notes:

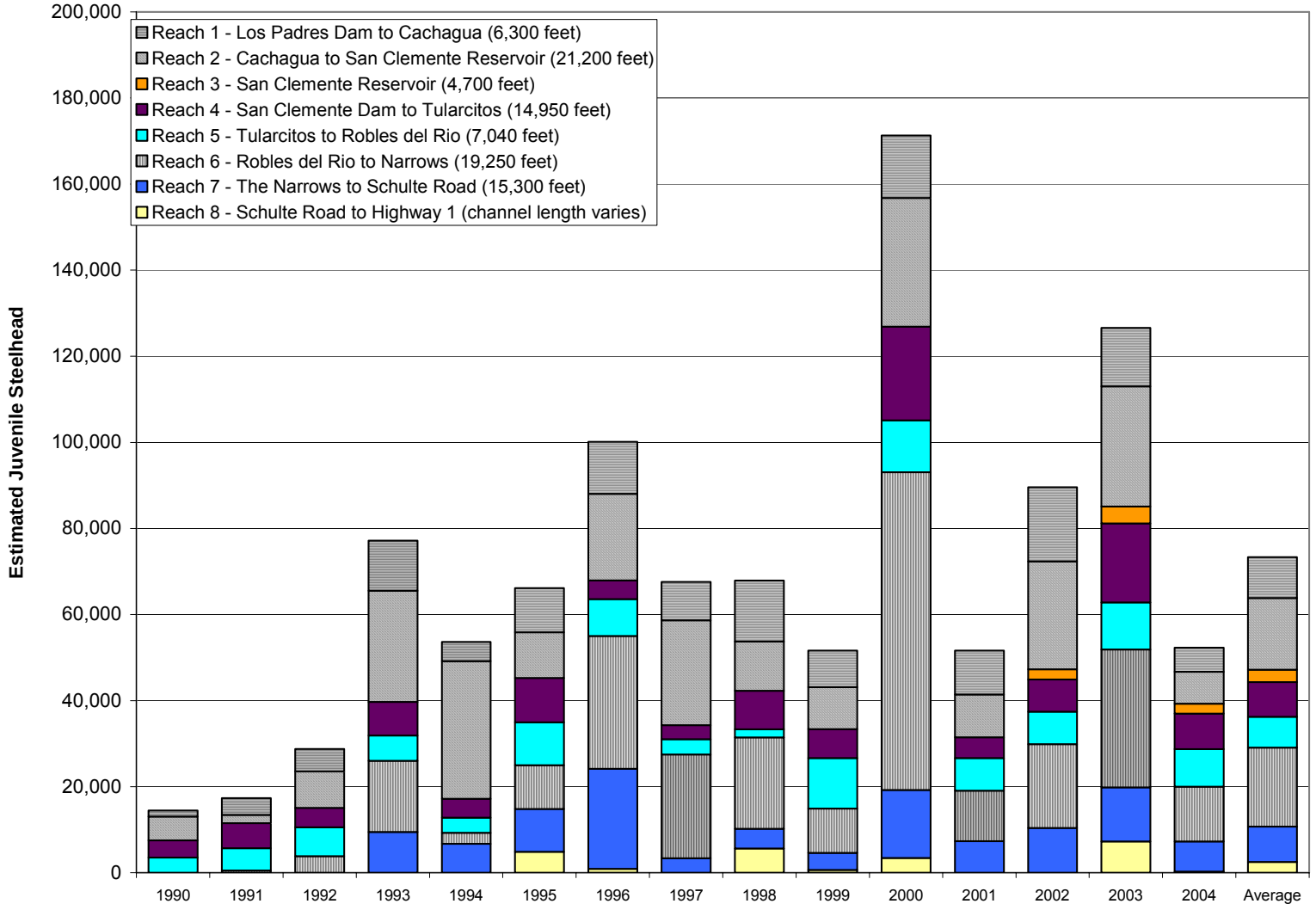
[1] Surveys completed in October and results based on repetitive 3-pass removal method using an electrofisher.
[2] Average 1994-on comparison does not include data for lowest river sites at Meadows Road (1995); Schulte Area (1996), and Red Rock Area (1997-2003).
[3] RM; indicates site location in miles from river mouth.
[4] ND means No Data was collected, A "0" indicates stream was dry at sampling station, no entry means that the site was not part of the sampling program..

Table 4.4-4: Carmel River Juvenile Steelhead Population Density 1973-2004

Year	No./foot	No./mile
1973	1.16	6,121
1974	0.69	3,648
1983	1.16	6,116
1984		
1985	0.94	4,966
1986	1.77	9,307
1987	0.97	5,107
1988		
1989	0.00	22
1990	0.14	733
1991	0.25	1,294
1992	0.59	3,098
1993	0.96	5,075
1994	0.51	2,713
1995	1.00	5,281
1996	1.12	5,890
1997	0.83	4,359
1998	0.74	3,901
1999	0.64	3,403
2000	1.83	9,680
2001	0.70	3,716
2002	1.09	5,734
2003	1.47	7,738
2004	0.66	3,480
Averages		
1973,74,83,85-87	1.12	5,878
1989-1991	0.13	683
1992-2004	0.93	4,928

Source: Snider 1983 (1973-1974), CDFG (83, 85-87), MPWMD (1990-2004)

Figure 4.4-6: Carmel River Juvenile Steelhead Density in the Carmel River Downstream of Los Padres Dam (LPD) from 1990-2003



4.4.1.6 Distribution of Habitat

Spawning

In most years an estimated 61.5 miles of channel (mainstem and tributaries) provide spawning habitat in the Carmel River system, including approximately 40.5 miles upstream of SCD and 21.0 miles downstream. Spawning habitat distribution in the mainstem Carmel River is presented in Table 4.4-5. According to Dettman (1990) slightly more than half of the potential spawning habitat occurs upstream of SCD. Total area of spawning habitat in the 25.3 miles of the mainstem is estimated at 120,000 square feet. Of that total, the estimated amount of spawning habitat upstream of SCD in the mainstem is 70,800 square feet (59 percent) compared to 49,200 square feet downstream of SCD (41 percent).

Table 4.4-5: Spawning Habitat Distribution Estimated within the Carmel River Mainstem Upstream and Downstream of San Clemente Dam

	Upstream	Downstream	Total
Square Feet	70,800	49,200	120,000
Percent	59%	41%	-

Rearing Habitat

Summer rearing habitat for juveniles is believed to be the most critical limiting factor for juvenile steelhead production in the Carmel River Basin. Almost three-quarters of the potential summer rearing habitat occurs upstream of SCD (Table 4.4-6), and varies depending upon the type of water year. Each dry season, depending on the amount of winter rainfall and pumping volume from the Carmel Valley Aquifer, the river downstream of Robles del Rio can dry back from one mile upstream of the mouth up to 5 to 8 miles, causing a loss of rearing habitat. During times when the river begins drying back, juvenile steelhead are rescued from the drying reaches and tributaries by the MPWMD and volunteers from the Carmel River Steelhead Association. Rescued fish are taken to the Sleepy Hollow Steelhead Rearing Facility (SHSRF) or released into permanently flowing sections of the Carmel River.

Table 4.4-6: Rearing Habitat Index for the Carmel River Watershed*

		Young-of-the Year (0+)		1 + and Older Fish	
Portion of the Watershed	**Reaches**	**Total Rearing Index Units****	**Percent Watershed Rearing**	**Total Rearing Index Units****	**Percent Watershed Rearing**
Upper	0	3.8 million	39%	2.5 million	57%
Middle	1,2	3.2 million	33%	0.8 million	20%
Lower	4,5,6	2.7 million	28%	1.0 million	23%
Total		9.7 million		4.4 million	

Notes:

Watershed delineation as noted by MPWMD 1998. Reaches 3, 7, 8, & 9 not sampled by MPWMD nor included in analysis. San Clemente Dam divides the middle and lower watersheds

10* Total rearing index units are a measure of rearing index per foot multiplied by the length of the section

*Based on a rearing index presented in (Dettman 1990)

During most water years (aside from critically dry and dry years) approximately 49 miles of channel support habitat for juvenile rearing, including 36 miles upstream of the SCD and 13 miles downstream (Table 4.4-6). A "Rearing Habitat Index" (RHI) model was developed for the mainstem Carmel River (Dettman and Kelley 1986, Dettman 1990) as a method to assess the quality and quantity of rearing habitat available in the river. Dettman divided the river into upper, middle, and lower sections and evaluated rearing habitat for 0+ and 1+ steelhead. The RHI model shows about 72 percent of Age 0+ and 77 percent of Age 1+ and older rearing habitat is located in the mainstem Carmel River upstream of SCD (Table 4.4-6). About 33 percent of Age 0+ and 20 percent of Age 1+ and older rearing habitat is located between SCD and LPD. About 28 percent of Age 0+ and 23 percent of Age 1+ and older rearing habitat is located downstream of SCD (Table 4.4-6).

4.4.1.7 Sleepy Hollow Steelhead Rearing Facility

The Carmel River does not maintain surface flows through most summers in a nine-mile reach downstream of the Scarlett Narrows and in some years, a 1.8-mile reach upstream of the Narrows. As part of the steelhead mitigation program, the MPWMD has rescued juvenile steelhead from drying reaches since 1991. Following the 1987 to 1992 drought, steelhead production has increased in the Carmel River drainage and less rearing habitat is available in the lower river for rescued fish. The Sleepy Hollow Steelhead Rearing Facility (SHSRF) accommodates any rescued fish that are not transplanted and reared in the river.

The SHSRF was constructed one mile downstream of SCD as mitigation for project operations on the Carmel River in order to meet the increased demand of summer rescues for rearing juvenile steelhead through the dry season.

In early 1997 the District completed construction of the SHSRF, which includes a diversion and pump station, three large circular tanks, an 800-foot long rearing channel, electrical, water, pressurized air and drainage systems, a combination office-shop-lab building and miscellaneous equipment. The water diversion facility includes a screened intake, located in a large pool adjacent to the facility. Approximately 250 feet of 6-inch-diameter PVC pipe delivers up to 1 cfs of river water to the holding tanks and supplemental rearing channel. The channel and tanks are sized to hold and rear a maximum of 64,000 wild Ages 0+ and 1+ steelhead. The fish are allowed to emigrate out of the rearing facility during the fall and winter period when flows increase available habitat in the river (Hanna and Dettman 1993).

Two alternative sources of water serve as a backup supply for the river diversion. A 4-inch pipeline connects to CAW's 24-inch diversion pipeline that supplies the Carmel Valley Filter Plant (CVFP) and is used as back up in case of a power failure. This would occur if the main intake is damaged or needs servicing or if flow in the river is too high during the fall/winter period. A second backup system with a five horsepower pump can draw water directly from the river in case of other emergencies (Hanna and Dettman 1993).

The survival rate for juvenile fish at SHSRF after construction was lower than expected (less than 15 percent) due to warm river water temperatures and the resulting infectious diseases caused by *Ichthyothirius* and *Flexibacter columnari* outbreaks and mortalities. In October 2000, a new cooling tower, new pumps, an emergency generator, and electrical panels were installed to reduce water temperatures and disease problems and decrease the mortality rate. Water temperature goals at the SHSRF are:

- Maximum daily water temperature should be 70 °F; and
- Mean daily water temperature should not exceed 65 °F.

An automated alarm system was installed in June 2001 and upgraded in 2002 to monitor power supply, pumps, water depth, water flow, temperature, and pressure. The system automatically calls MPMWD staff when problems occur to the water or power supply.

SHSRF was out of service during the 2002 rescue season because of damage to the two river pumps. Sand and fine silt abrasion in the pump housing damaged the seals and impellers in the pumps. One pump was overhauled while the other was replaced. A sand and silt separator was installed to prevent damage to river pumps. In anticipation of additional sediment problems during the DSOD-required Interim Seismic Safety Measures spring/summer SCD drawdowns, MPWMD retrofitted the SHSRF intake structure. The intake pumps were upgraded and an additional backup pump and portable pump was purchased prior to the 2003 fish rescue season.

Juvenile steelhead survival rates for SHSRF were greater than 40 percent for the 2003 and 2004 rescue seasons and were estimated to be near 50 percent for the 2005 rescue season. The number of fish released from SHSRF included up to 12,500 juvenile steelhead for the 2003 and 2005 rescue seasons (MPWMD 2003b and 2006).

4.4.1.8 Fish Passage at SCD

Steelhead passage at SCD is predicated by a series of events that happen in sequence each year. Similar to many other coastal streams from the Navarro River in the north to the Ventura River or Malibu Creek in the south with bar-built lagoons, the Carmel River is only seasonally connected with the ocean. Before adult steelhead can enter the river for spawning, the mouth of the river has to connect with the ocean. The hydrologic connection is initiated by runoff from winter storms.

In the Carmel River, flows into the lagoon must increase to about 200 cfs to fill the lagoon and breach the bar to open the mouth. Opening of the barrier beach at the mouth is managed by the Monterey County Water Resources Agency under a BO issued by NMFS to avoid flooding low lying homes. The protocols require certain conditions to be met prior to artificially opening the lagoon instead of allowing it to overtop the barrier beach without intervention. These protocols combine the use of river

flow at the Near Carmel Gage with lagoon water levels to determine when or whether to artificially breach the bar.

In order for the river to establish surface flow at the Near Carmel Gage however, the following sequence of events must occur after rainfall begins in the watershed: 1) Los Padres Reservoir must first fill and spill, providing flows from the upper watershed; 2) San Clemente Reservoir must fill and spill; 3) the aquifers in the Carmel Valley that are pumped for water supply during the summer and are depleted by fall must recharge before surface flow is restored through the Carmel Valley and connects with the lagoon; and 4) a storm event that generates about a 200 cfs flow into the lagoon must occur.

Access from the ocean to the Carmel River is normally established by mid February (Table 4.4-7). Along with a hydrologic connection of the river and the ocean, there is a seasonal component to the steelhead migration. Steelhead generally migrate from December to May and sometimes June in the Carmel River. A summary of the 1992 to 2006 steelhead migration and river opening timing is provided in Table 4.4-7. For three years prior to 1992 the river mouth remained closed during the drought years of 1988 through 1990 and it opened only briefly in 1991. Records on the timing of the river mouth openings prior to 1988 are incomplete and this period was not included in the table. The mouth must remain open for migration into the river to be sustained. The mouth may close if flows drop to less than 20 cfs at the Near Carmel gage. For adult steelhead to successfully move upstream though the Carmel Valley, flows of between 45 to 75 cfs must be sustained for fish to pass the most shallow (critical) riffles.

If the above conditions are met and sustained during the migration season, steelhead would enter the river and begin arriving at the base of SCD.

Adult Migration

In some years the upstream adult migration begins as early as mid-December (Table 4.4-7). The steelhead migration can extend through April into May or even June in some years. A consistent period of high activity occurred during a six-week period from late February through March for the 15 years of record, when about 66 percent of the steelhead passed through the ladder. For the 15 years of record, steelhead have migrated upstream as early as late November (in one year out of 15) when the mouth opened early, and as late as June (1 year out of 15) when the ladder was still operating. The late migration occurred in 1998 following a very wet winter and spring that coincided with a relatively large adult run (over 800 fish). In most years of record, the ladder was closed or the counter removed by the end of May so there may have been other years when fish movement occurred in June but was not documented. Local climate conditions during these years played a key role in the timing of the early and late upstream migrations. Early migration can occur when storms open the river mouth earlier than usual. Late migrations have occurred in years when late spring or early summer flows are still very high. During this 15-year period, early and late migrations have not occurred within the same year.

Table 4.4-7: Fifteen Year Summary of Adult Steelhead Counted in Semi-monthly Periods at San Clemente Dam Showing Timing of River Mouth Opening and Migration in the Carmel River 1992-2006

Semi-monthly Period	1992-2006 Total No. of Steelhead* Counted for Period	Percent of Total Steelhead Migration for Period	No. of Years Steelhead Counted in Ladder for Period	No. of Years Mouth First Opened ** in this Period	No. of Years Counting Stopped or Ladder Closed in this Period
Nov-1 to Nov-15	0	0.0%	0	1	
Nov-16 to Nov-30	2	0.0%	1	0	
Dec-1 to Dec-15	12	0.2%	1	5	
Dec-16 to Dec-31	99	1.5%	5	3	
Jan 1 to Jan 15	198	3.0%	9	3	
Jan-16 to Jan-31	546	8.2%	11	1	
Feb-1 to Feb-14	653	9.8%	13	1	
Feb-15 to Feb-28/29	1,348	20.3%	15	1	
Mar-1 to Mar-15	1,717	25.8%	15		
Mar-16 to Mar-31	1,335	20.1%	15		
Apr-1 to Apr-15	486	7.3%	13		
Apr-16 to Apr-30	186	2.8%	9		4
May-1 to May-15	36	0.5%	6		1
May-16 to May-31	15	0.2%	4		9
Jun-1 to Jun-15	5	0.1%	1		
Jun-15 to Jun-30	8	0.1%	1		1
Total	6,646			15	15

Fish counted in the SCD ladder prior to the lagoon opening were removed from the total

* Migration Year is fall/winter period of Year-1 and winter/spring period of Migration Year (MY). (Example MY 1992 is from Nov 1991 to Jun 1992)

* * Mouth of River opened one year out of 15 in Nov 1-15 Period, Mouth was open the same year for Nov 16-30 period. For this set of years, mouth was always open by Late February.

In summary, the seasonal hydrology is an important factor that greatly influences the beginning and end of the migration season. However, in spite of the hydrology, in most years the peak migration occurs between mid February and the end of March, during which about two-thirds of the run is counted at SCD with about more than 90 percent of the run counted at SCD between mid January and the end of April (Table 4.4-7). When flows are not capable of sustaining passage, or when there are no more steelhead waiting in the ocean to enter the river, the migration for that year is essentially over, even if the migration season has not ended. Conditions to support migration end when

the river flow through the valley falls below 45 cfs and access to the lagoon is no longer possible when the bar closes which normally happens when flow at the Near Carmel River gage falls below 20 cfs. In some years conditions suitable for upstream migration continue to persist long after the last fish has been counted in the ladder.

Juvenile Migration

Juvenile steelhead can move downstream year-round but peak periods of movement occur during the initial runoff of the wet season and then again in March through May (Shapovalov and Taft 1954). Adults that have spawned in the upper watershed can return to the ocean and become repeat spawners in future years. Adult and juvenile downstream passage is not as constrained as upstream passage by depth of flow, but the mouth must be open for adults (and smolts) to move into the ocean. If the mouth is not open, smolts and adults may reside in the lagoon during the summer and complete their migration the following fall or winter when the mouth does open. Smolts feed on the abundant invertebrate fauna in the lagoon and can grow rapidly as long as dissolved oxygen levels remain suitable and lagoon depth is not compromised. Lagoon habitat is dependent upon inflow. During dry years when inflow is low, water levels drop and fish are exposed to poor water quality conditions (warm temperatures and low DO levels). Poor water quality can force fish toward the surface where oxygen levels are better but in the process expose fish to predation by gulls and other birds. Lagoon residency is not a good option for adults since they do not feed while in freshwater and water quality conditions in the lagoon can be poor during the summer and fall.

Description of the Existing Fish Ladder

Passage of fish from the lower river to upstream of the Dam is currently accomplished with a pool and weir fish ladder with an entrance at the plunge pool below the Dam and exit at the upper end of the ladder into the reservoir on the San Clemente Creek (west) side of the Dam. The existing ladder has 28 pools and rises some 68 feet from the river to the reservoir. While the average step between pools is a little more than 2 feet, some steps in the ladder range up to about three feet. Passage into the reservoir is through the Dam via an 18-inch high by 24-inch tunnel with a floor elevation of 524.5 feet (or 0.5-foot lower than the present spillway elevation of 525 feet above MSL). The ladder has three resting pools and can operate at flows of between 10 and 2 cfs. Flow is regulated by adjusting the slide gate on the upstream side of the Dam. Ladder walls are not high enough above the water level in the ladder to prevent fish from jumping out of the ladder. Metal screen fencing has been installed along the upper walls to contain jumping fish and keep them from leaping out of the ladder.

Prior to 1997, flashboards were installed in SCD at the end of April to surcharge the reservoir and increase storage. At the time flashboards were installed, the fish ladder was closed. Surcharging the reservoir stopped after the 1996 season because much of the inundated area was so shallow it increased summer water temperatures, thereby increasing water temperatures in the river downstream of the Dam and creating disease problems in the temporary fish rearing tanks at Sleepy Hollow.

The existing ladder does not meet current standards for fish passage conditions promulgated by either NMFS or CDFG. The new ladder would have a maximum of one foot steps between pools, greater freeboard, adequate pool volume, greater attraction flows and will provide for upstream fish to swim from one pool to the next instead of jumping as in the present ladder.

After exiting the fish ladder into San Clemente Reservoir, steelhead swim through the reservoir into the Carmel River or San Clemente Creek and continue upstream migration.

4.4.1.9 2030 Baseline Conditions

San Clemente Reservoir, San Clemente Creek, and the Carmel River would continue to change through time and so an extended environmental baseline setting through the year 2030 is used in this analysis. The 2030 Baseline incorporates the changes that are expected to occur over the 25 years from initiation of the EIR/EIS to provide a more comprehensive analysis and evaluate trends and changes that may occur to existing conditions.

One of the major changes that could affect aquatic resources is the prediction that San Clemente Reservoir will fill with sediment within 6 to 10 years. As a result of this filling, the Annual Drawdown would only continue until the reservoir storage capacity is less than 50-acre feet. In the absence of new sediment management action, sediment would begin to move into or block the fish ladder, interfering with successful steelhead migration up the existing ladder.

Aquatic habitat conditions upstream of SCD in the Camel River and in San Clemente Creek would generally continue to improve as riparian vegetation would become established and continue to develop along the channel. This, in turn, would cause the banks to become more defined. All of the riparian vegetation along San Clemente Creek and most of riparian vegetation along 4,800 feet of the Carmel River upstream of SCD has developed since 1996 after the practice of raising the reservoir water level by 12 feet each spring was discontinued. The raised water level previously prevented vegetative growth in the inundated area below elevation 537 feet.

4.4.2 ENVIRONMENTAL RESOURCE IMPACT STANDARDS AND METHODS

4.4.2.1 Standards of Significance

The significance criteria for evaluating project effects for this EIR/EIS are similar to the criteria and standards of significance used in the CRDRP (as modified and updated from the 1994 Final EIR/EIS for the New Los Padres Project) (MPWMD 1998). In accordance with these criteria, as well as CEQA Guidelines and agency and professional standards, a project impact would be significant if the project would:

- Have a substantial adverse effect, either directly or indirectly through habitat modifications, on any species identified as a threatened or endangered, candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG, NMFS, or USFWS;

- Prevents or interferes substantially with the movement of any native resident or migratory fish species;

- Conflicts with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan.

4.4.2.2 Impact Assessment Methodology

Impacts to Carmel River steelhead and aquatic habitat conditions are evaluated for the 2030 Baseline Condition (reservoir filled with sediment) and compared to Existing Conditions and to the Proponent's Proposed Project and each of the alternatives. The effects of the Proposed Project and each alternative are evaluated with respect to aquatic habitat conditions and fishery resources within each of the 6 fishery reaches or 10 geomorphic reaches in the Carmel River downstream of SCD and in the inundation area of the reservoir upstream of the Dam. Issues related to fish passage are also considered. Assessing the effects of sediment movement to downstream habitat is an important component of the analysis. Sediment will begin moving downstream when the reservoir fills with sediment (the No Project Alternative, Proponent's Proposed Project, and Alternative1), additionally with the operation of a sluice gate under the Proponent's Proposed Project or Alternative 1 and with dam removal under Alternatives 2 and 3.

Sediment, Aquatic Habitat Conditions and Effects on Steelhead

There are two general categories of sediment that are evaluated in this document relative to aquatic habitat conditions and steelhead populations: deposited sediment and suspended sediment.

Deposited sediment is the sediment that makes up the channel bed and banks and is carried in the river as bedload along the bottom of the channel primarily during storm events. Changes to the nature of the channel bed and floodplain can alter the physical habitat conditions in and along the river. Generally, finer sediment, such as sand, is more deleterious to biological resources than coarse sediment like gravel or cobble. Large volumes of sediment would generally cause negative changes to habitat conditions, regardless of the particle size of the sediment. Even moderate volumes of fine sediment can have deleterious effects on spawning habitat and on life stages ranging from zygotes to alevins buried in the gravel. Deposited fine sediments can reduce or cut off water flow through the gravel and suffocate zygotes. Deposition of coarse sand does not necessarily cut off inter-gravel flow, but can entomb alevins in the redd by creating a physical barrier between the redd and the river that young fish are not capable of escaping.

Large sediment volume can fill pools, obliterate channel features and turn single thread channels into multi-thread channels. Sediment flux (the change in sediment volume from year to year) can have varying effects on riparian vegetation. Moderate amounts of sediment deposited on the floodplain can provide a substrate for riparian vegetation to become established and grow. In contrast, large volumes of sediment can cover and kill established vegetation. Aquatic habitat conditions from deposited sediment are evaluated by looking at the change in reach-averaged bed elevation, change in substrate volume and change in volume of gravel at the end of the hydrologic simulation period.

The analysis of deposited sediment evaluates reach conditions to support adult upstream migration, spawning and incubation habitat for zygotes and alevins, and rearing habitat to support juvenile steelhead. Adult migration could be impaired if large volumes of sediment are deposited in the channel possibly creating critical passage conditions. Spawning and incubation habitat would be improved by an increase in the volume of gravel, or degraded by an increase in fines. Rearing habitat would be improved by an increase in cobble and gravel or degraded by an increase in fines.

Suspended sediment is fine sediment (mostly clays and fine sands) that is carried as suspended load in the water column greater than 0.5 foot above the bed of the channel. Some of the bedload in a river is moved along the bed by bouncing along the bottom, hence, the near bed water column contains both sediment that is carried in suspension and the coarser bedload. The water column above 0.5 feet over the bed primarily contains only suspended sediment. It is the suspended sediment that causes the muddy appearance of the Carmel River and other streams during storm flows. High suspended sediment levels normally occur in the Carmel River during winter runoff events when migrating adults, incubating zygotes, juvenile steelhead, and smolts can be present in the river. Any effects from the project that would alter winter turbidity conditions could affect these life stages.

During low flow periods which occur during the summer, water in the river is typically clear so an increase in turbidity or suspended sediment from project activities would have a detrimental effect on juvenile steelhead rearing in the river. Conditions could become adverse depending on the concentration of suspended sediment and the duration of exposure.

Analyses that evaluate effects on the various life stages of steelhead in the Carmel River depend on available information on steelhead population. Juvenile steelhead data is available from 1990 to 2004 (Table 4.4-3) and adult counts are available for 1992-2006 (Table 4.4-7). There is limited information on spawning use in the river and virtually no data on incubation. Most of the data available provides for an analysis on life stages from young-of-the-year to two year olds and adults. There is limited information available on the number or distribution of redds in the Carmel River and on the smolt life stage in the Carmel River. Life stages between smolts and adults occur in the ocean and would not be directly affected by the Proponent's Proposed Project. Therefore,

analysis of effects to steelhead is focused on the juvenile data that includes young-of-the-year, yearling and two-year old fish and on the adults based on counts at SCD. Analyses of project effects on steelhead redds containing the incubation life stage and on the smolt life stage are based on information from the literature and inferences drawn from knowledge of the Carmel River steelhead biology.

DEPOSITED SEDIMENT

The effect of deposited sediment varies depending on the starting channel bed conditions and on the volume and sediment particle size of the deposited sediment. The habitat change for a gravel-cobble bed channel that is covered by fine sediment such as silt and fine to coarse sand would be negative as the fine sediment would fill in the interstitial spaces in the substrate and eliminate habitat for invertebrates and cover for fish. However, gravel substrate deposited on a stream bed that is composed primarily of boulder and cobbles could improve conditions for spawning, invertebrate production and juvenile rearing. An increase in streambed elevation could be positive for habitat if it improves pool and riffle sequences in the channel but this would depend on the degree of increase in elevation, the particle size, and the starting conditions of the bed.

Fishery and invertebrate effects were attributed to changes in bed elevation, change in volume of sediment and change in volume of gravel with the assumption that a change in reach-averaged bed elevation has to be greater than 0.5 foot to be meaningful because the average bed elevation includes both the wetted channel and flood plain. If the change in the model output meets that criteria, then aquatic habitat conditions are evaluated under the following guidelines: 1) an increase of 2 feet or more of channel bed elevation (aggradation) and/or an increase in sediment volume would tend to fill habitat features like pools and runs and create a braided channel or critical riffles that could create fish passage problems, 2) a decrease of 2 feet or more of channel bed elevation (degradation) and/or a decrease in sediment volume would tend to scour channel features such as riffles or bordering vegetation and act to simplify habitat. 3) An increase in gravel volume would generate a positive biological response by improving spawning habitat and invertebrate production, 4) a decrease in gravel volume could have a negative effect by degrading spawning habitat and invertebrate production if the gravel would be replaced by sand; 5) if gravel would be replaced by cobble, the effect would be neutral to positive.

As an example, in SR 4.3, aggradation and an increase in gravel volume could have a beneficial effect because the present armored condition of this reach provides for almost no gravel in this reach. However, in SR 9, in the lagoon, aggradation and an increase in sediment volume could have a negative effect on fisheries habitat because valuable deep water habitat for summer and fall growth could be reduced; conversely, degradation and a reduction in sediment volume in the lagoon would have a beneficial effect.

Changes in habitat quality related to substrate quality are evaluated through use of a sediment transport model (MEI 2003). The sediment transport model evaluated and compared Existing Conditions, the 2030 Baseline and Alternatives 1, 2 and 3. The 2030 Baseline model run represents conditions consistent with the Proponent's Proposed Project and Alternative 4 (reservoir full of sediment with a small remnant pool) and is similar to the modified baseline (reservoir full of sediment without a small remnant pool that was used to represent the worst case scenario for modeling the effects of sluicing) as presented in Hydrology Section 4.2. The sediment transport model predicts a change in sediment particle size and bed elevation in yearly time steps based on historical hydrology on a reach-averaged basis (Mussetter 2003). The effects of sediment particle size and change in bed elevation are evaluated as being "better," "worse," or "about the same" relative to Proponent's Proposed Project. Additional reports were prepared to address the specific effects of some alternatives on sediment transport (MEI 2005, 2006b). Appendix M provides additional information on the sediment model.

The model output sums the amount of sediment that each flow event moves past the Dam site and how much of that amount is deposited in the lower river at the end of the 41-year modeling period (Appendix N). Parameters from the model include change in bed elevation, change in sediment volume and change in volume of gravel for each subreach.

SUSPENDED SEDIMENT

The effects of suspended sediment were assessed using an index developed by Newcombe and Jensen (1996). Their work evaluated potential adverse effects on fish from suspended sediment through the development of an empirical model based on numerous laboratory studies that examined responses of fish to the length of exposure to various suspended sediment concentrations. Suspended sediment has been documented to affect steelhead in several ways.

At low levels suspended sediment can reduce visibility disrupting social interactions, and interfering with feeding behavior at low levels and causing habitat degradation and causing physical stress and harm at high levels of suspended sediment. The concentration and duration of exposure to suspended sediment are nearly equally important factors in assessing impacts to fish and aquatic habitat. Higher levels of suspended sediment and longer exposure times generally create a greater, more deleterious effect on fish. Even persistent low levels of suspended sediment can cause stress that reduces feeding, slows growth, impairs reproductive abilities, reduces population size, and causes mortality. At low concentrations, suspended sediment can cause avoidance behavior, reduced feeding, respiratory impairment, or reduced tolerance to disease and toxicants (Waters 1995). Suspended sediment can also affect fish ecologically by increasing invertebrate drift and reducing light penetration in the water column, thereby reducing primary productivity (ENTRIX 2005a).

Newcombe and Jensen (1996) developed the empirical model to estimate the effects of various levels of exposure to suspended sediment on fish. The equation for the empirical model is:

$$Z = a + b\ (ln[\text{exposure time}]) + c\ (ln[\text{concentration}])$$

Where:

Z is the Severity of Ill Effects Score (SEV); *a*, *b*, and *c* are factors adjusted according to fish species (or group) and life history stage; and *ln* is the natural log,

Newcombe and Jensen (1996) based their model on a large body of peer reviewed and published literature on the effects of fish exposure to suspended sediment. Data from many studies, most of them laboratory studies, were used to develop multiple regressions to generate the model equation. Although the model is useful in making broad estimations of suspended sediment effects, it has a wide range of error, and therefore needs to be applied with caution to average daily suspended sediment concentrations from the MEI model. Newcombe and Jensen's model helps to illustrate key points about the effects of suspended sediment on fish and on strength of the relationship between the SEV score and Level of Effect: 1) Duration of exposure is almost equal in importance to suspended sediment concentration in determining the overall effects of suspended sediment; 2) A wide range of suspended sediment concentration and duration of exposure can result in a similar SEV score (Figure 4.4-7, top and bottom); 3) There is an exponential difference between one Effects Level and the next, and 4) There is a large amount of overlap in the response of individual fish to suspended sediment concentration and duration (See Table 4.4-8).

EFFECTS LEVELS

Effects Levels are evaluated through the calculation of SEV scores and then the scores are used to group the effects into four different levels: No Effect (SEV=0), Behavioral Effects (SEV=1 to 4), Sublethal Effects (SEV=5 to 8), and Lethal and Paralethal Effects (SEV ≥ 9).

Behavioral effects (SEV Scores of 1 to 4) occur at relatively low levels of suspended sediment and can alter fish behavior. In some cases, fish initially will attempt to move away from turbid water into clearer water if it is available. Fish that remain in areas of elevated suspended sediment will experience reduced visibility. For visually oriented and territorial species such as steelhead trout, a reduction in visibility may result in a reduction in the efficacy of feeding as well as a breakdown of social structure in the stream.

Table 4.4-8: Effects and Severity Types of Ill Effects Scores (SEV) to Fish from Exposure to Suspended Sediments

No Effects (SEV=0)
Behavioral Effects (SEV=1-4)
Avoidance and distribution
Risk to predation
Reduced feeding
Sublethal Effects (SEV=5-8)
Impaired homing and migration
Respiratory impairment
Physiologic effects
Stress
Reduced growth
Reduced tolerance to disease and toxicants
Lethal and Paralethal Effects (SEV > 9)
Reduced growth rate
Reduced reproductive success
Reduced fish density
Moderate to severe habitat degradation
Direct mortality

Note: compiled from Newcombe and Jensen 1996 and Waters 1995

Sublethal effects (SEV Scores of 5 to 8) to fish health can occur from short- and long-term exposure to various levels of suspended sediment concentrations. High concentrations or long-term exposure to moderate levels of suspended sediment concentrations may cause respiratory irritation and impairment as well as a reduced tolerance to disease and toxicants. High suspended sediment concentrations may further disrupt sensory perception to the point of interfering with or preventing the homing behavior of migrating steelhead. All of these direct physiological impacts culminate in a general stress increase characterized by physiological symptoms such as elevated cortisol levels in the bloodstream.

Lethal and paralethal effects (SEV Scores of 9 to 14) may result from extremely high and/or prolonged exposure to suspended sediment concentrations. Harsh physiological effects may severely stress fish decreasing health or causing direct mortality. This level of effect would likely result in a measurable change in fish abundance and distribution and would be an adverse effect on the population. The youngest steelhead life stages

may be particularly susceptible to mortality from the smothering of eggs in the gravel and the entrapment of emerging sac fry if high suspended sediment concentrations also result in the deposition of fines on the bed.

Newcombe and Jensen organized these effects into a relative scale presented in Table 4.4-8. Figure 4.4-7 shows the effects of suspended sediment concentration and duration of exposure on the average SEV scores on adult and juvenile salmonids.

Figure 4.4-7: Empirically Derived Average of Severity of Ill Effects (SEV) Scores Table (calculated) Showing the Relationships for Juvenile and Adult Salmonids

Juvenile and Adult Salmonids

Duration of exposure to SS (log_e hours)

	0	1	2	3	4	5	6	7	8	9	10	

(B) Average severity-of-ill-effect scores (calculated)

Concentration (mg SS/L)												(log_e mg SS/L)
162755	10	11	11	12	12	13	14	14	-	-	-	12
59874	9	10	10	11	12	12	13	13	14	-	-	11
22026	8	9	10	10	11	11	12	13	13	14	-	10
8103	8	8	9	10	10	11	11	12	13	13	14	9
2981	7	8	8	9	9	10	11	11	12	12	13	8
1097	6	7	7	8	9	9	10	10	11	12	12	7
403	5	6	7	7	8	9	9	10	10	11	12	6
148	5	5	6	7	7	8	8	9	10	10	11	5
55	4	5	5	6	6	7	8	8	9	9	10	4
20	3	4	4	5	6	6	7	8	8	9	9	3
7	3	3	4	4	5	6	6	7	7	8	9	2
3	2	2	3	4	4	5	5	6	7	7	8	1
1	1	2	2	3	3	4	5	5	6	7	7	0
	1	3	7	1	2	6	2	7	4	11	30	
	Hours			Days			Weeks		Months			

Half-95% confidence intervals (±)
around calculated severity-of-ill-effect scores (above)

162755	0.9	0.8	0.8	0.8	0.7	0.7	0.8	0.8	-	-	-	12
59874	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.7	-	-	11
22026	0.7	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.7	0.7	-	10
8103	0.6	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8	9
2981	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	8
1097	0.6	0.5	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7	7
403	0.6	0.5	0.4	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.7	6
148	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.7	0.8	5
55	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.8	4
20	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.9	3
7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9	1.0	2
3	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1.0	1.0	1
1	1.0	1.0	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.1	1.1	0
	1	3	7	1	2	6	2	7	4	11	30	
	Hours			Days			Weeks		Months			

Source: Newcombe and Jensen (1996)

The analysis of impacts uses an empirical model of suspended sediment concentration effects on salmonids to estimate effect levels.

Using the sediment model, average daily suspended sediment concentrations (SSC) (in the water column greater than 0.5 feet above the river bed) were simulated for the 41 year period of record for Existing Conditions, the 2030 Baseline, and the project alternatives. These results were examined using a frequency analysis and time series graphs.

Average daily suspended sediment concentrations were simulated to compare potential effects of sediment management activities (sluicing) with the same dam configuration without sluicing for a wet year (1978) and dry year (1985) to represent conditions for the Proponent's Proposed Project and Alternative 1. Dam removal would occur under Alternatives 2 and 3; sluicing would not be a component of these two alternatives.

The representative suspended sediment analysis was run from the simulated sluice event date to the end of June because the model routed sediment down the fish ladder during the low-flow season. Sediment movement down the fish ladder during the low flow season would be precluded by other sediment management activities so the analysis of suspended sediment was restricted to the period from the modeled sluice event to June 30 and did not include the period from July 1 to the end of the calendar year. The details of sluicing events are discussed in Section 4.2 and Appendix J.

Using the SEV scores developed by Newcombe and Jensen (1996) described above, the number of consecutive days of average daily suspended sediment level for each geomorphic reach was accumulated for each day to equate to an SEV score for the simulated wet-year (to June 30) for the 2030 Baseline and compared to Existing Conditions, the Proponent's Proposed Project and each alternative. For the Proponent's Proposed Project and Alternative 1, a modeled sluicing event was added to the analysis for comparison purposes. The comparable SEV scores are summarized by Geomorphic subreach for Existing Conditions, 2030 Baseline (representing Alternative 4 or Future No Project conditions), the Proponent's Proposed Project and each Alternative (Table 4.4-9).

The simulated exposure times for modeled suspended sediment concentration data were not directly applied to the X and Y axes of the Newcombe and Jensen empirical model provided in Figure 4.4-7 (top graph) because the modeled suspended sediment concentration is based on average daily values whereas Newcombe and Jensen (1996) used a time step based on hours. In nature, suspended sediment is highly variable through time and space and reach-averaged daily values do not necessarily represent the range of concentrations of suspended sediment or exposure durations that fish in the river would experience. However, the analysis is a comparison of similarly structured modeled information and therefore can be used to make an informed comparison for the basis of this evaluation.

Table 4.4-9: Severity of Ill Effects Scores (SEV) for Suspended Sediment Concentrations

Subreach	Existing conditions	2030 Baseline	Proponent's Proposed Project	Alt 1	Alt 2	Alt 3
4.3	7	7	8	8	8	7
4.7	7	7	7	7	8	7
5	7	7	7	7	9	7
6.3	7	8	8	7	8	8
6.7	7	8	8	8	8	8
7.3	7	8	8	8	8	8
7.7	7	8	8	8	7	7
8.3	7	8	7	7	7	7
8.8	7	8	7	7	7	7
9	7	8	8	8	7	8

Note: Scores represent the number of consecutive days and Suspended Sediment Concentrations following a wet year sluice event for the existing conditions and 2030 Baseline compared to the Proponent's Proposed Project and alternatives by Subreach. The 2030 Baseline also represents the Future No Project Condition.

The suspended sediment model provides average daily values for suspended sediment concentration from post-processed simulations. Because of the modeling limitations, it is probably not valid to compare SEV scores between the Proponent's Proposed Project and the alternatives to evaluate differences in impacts. The error table (Figure 4.4-7, bottom graph) shows that the error in the SEV scores is relatively large. In consideration of the error inherent in the Figure 4.4-7 and the additional limitations imposed from the simulations, a more equitable assessment would be to compare effects levels (Table 4.4-8) instead of actual SEV scores (Table 4.4-9). The SEV scores are discussed and compared to support the effect levels determination.

Comparisons of the change in effect level are made between the 2030 Baseline condition, Existing Conditions, and Alternatives 1, 2, and 3. A difference in the SEV score within an effect level would not be either a significant or beneficial impact because of the factors described above. However, a change in effect level would be either significant or beneficial. SEV scores are presented in the following discussion to support the findings of the analysis. The effects levels in the Lethal and Paralethal range would be adverse for the population or habitat for the purposes of determining the level of significance of an action.

The SEV scores are shown in Table 4.4-9, and their corresponding effect level is shown in Table 4.4-8. The scores indicate that under existing conditions, storm events result in SEV scores of 7 in the 10 geomorphic subreaches downstream of SCD for the simulated hydrologic period. Under the 2030 Baseline, SEV scores increase from 7 to 8 in the downstream-most seven reaches (from 6.3 to 9) compared to the existing conditions because fine sediment would no longer be trapped in the reservoir after it has filled. For the Proponent's Proposed Project, SEV scores increase from 7 to 8 in six subreaches (4.3, 6.3, 6.7, 7.3, 7.7, and 9), compared to Existing Conditions and are similar to the 2030 Baseline. For Alternative 1, SEV scores increase from 7 to 8 in five subreaches (4.3, 6.7, 7.3, 7.7, and 9), compared to Existing Conditions, and are similar to the 2030 Baseline. For Alternative 3, SEV scores increase from 7 to 8 in four

subreaches (6.3, 6.7, 7.3, and 9), compared to Existing Conditions, and are similar to the 2030 Baseline. For the Proponent's Proposed Project, Alternatives 1 and 3 SEV scores do not result in significant changes compared to either Existing Conditions or 2030 Baseline because the SEV score remains within the Sublethal Effects Level. Additionally, the Proponent's Proposed Project, Alternative 1, and Alternative 3 each result in a change in SEV scores that are less than the SEV scores for the 2030 Baseline Condition.

For Alternative 2, the SEV scores increase from 7 to 8 in five subreaches (4.3, 4.7, 6.3, 6.7 and 7.3) and increase from 7 to 9 in one subreach (5) compared to Existing Conditions. The SEV scores increase from 7 to 8 and are similar to the 2030 Baseline, except in Subreach 5 that increases from an SEV of 7 to 9. This would be a significant impact because an increase from an SEV of 7 to SEV of 9 indicates the effect changes from the Sublethal Effect Level to the Lethal and Paralethal Effect Level.

Modeled suspended sediment concentrations were graphed to compare the suspended sediment effects of the Proponent's Proposed Project, and all alternatives (Appendix P, Figures P-1 through P-20).

Flow

The effects of the various alternatives on flows in the Carmel River were evaluated in 1998 for and presented in the 2000 RDEIR (Denise Duffy & Associates 2000) in Appendix D. Flow changes were found to be insignificant because the project is a dam safety project and would not change storage volume or operations. Flows are influenced by a change in storage behind a dam. This project would not result in an increase or decrease in storage but would maintain the status quo in regard to storage volume behind SCD. Short-term effects on flow from construction activities are addressed in the Impacts and Mitigation Section 4.4.3. Relocation of the point of diversion on the Carmel River upstream would affect flows in the section of river between the new diversion point and SCD where water is presently diverted. This effect is also addressed in the Impacts Section 4.4.3.

Construction and Operation Activities

This assessment evaluates effects of construction and operation on aquatic habitat in the Carmel River and on the steelhead population. The river channel in the vicinity of the Dam and downstream would be affected by the construction activities of the Proponent's Proposed Project and each alternative. Construction activities for road and bridge improvements to access the Dam or reservoir would occur during the first construction year primarily during the low flow season — June to October. Dam strengthening, notching or removal would occur in subsequent construction years and would only occur during the low flow season. The steelhead life stage that would be most affected by reservoir and stream dewatering and construction-related activities would be the juvenile rearing life stage. Fry and yearling steelhead would be rearing in the river. The adult and smolt migration is essentially complete and redds would no

longer hold alevins by June. Construction impacts, therefore, are evaluated in regard to the juvenile rearing life stage.

Operations following project implementation would affect all life stages of steelhead in the river downstream in all seasons. Conditions in the river downstream of SCD could be affected by sluicing to maintain fish passage through the reservoir during early winter storm events and by the transport of larger volumes of sediment passing the Dam for Alternatives 1, 2, and 3 compared to existing conditions. Under Alternative 4, No Project, sediment transport past the Dam would also increase relative to existing conditions because in six to ten years the Dam would be full of sediment.

Bed sediment transported past the Dam would affect aquatic habitat in the river downstream of SCD. These changes would affect all life history stages of steelhead including migrating adults, spawning habitat, incubation, rearing habitat and smolt outmigration.

Operations for the Proponent's Proposed Project and Alternative 1 include sediment sluicing to maintain fish passage through the remnant reservoir. Sediment sluicing is one method to manage sediment that accumulates behind the Dam for fish passage. Sluicing events would occur with the first storm event of the season and would affect fish in the river during the early winter period. Sluicing protocols require the sluice event to be staged as the river flow increases over 300 cfs. At flows above 300 cfs the channel segment immediately downstream of the Dam would have sufficient transport potential to mobilize all the sediment released during the following storm event. The analysis examines the levels of suspended sediment that steelhead in the river would be exposed to under the Proponent's Proposed Project and each alternative relative to existing and No Project conditions. Suspended sediment is primarily evaluated for its effect on rearing juvenile steelhead in the river, but the assessment is also applicable to adult steelhead.

Impacts are assessed on a river-wide basis using four components: 1) The amount and distribution of spawning habitat throughout the Carmel River system that has been assessed by Dettman (1990) and modeled in the mainstream Carmel River upstream and downstream of SCD by Alley & Associates (1992 and 1998) 2) The amount of juvenile steelhead rearing habitat available in the Carmel River summarized for the upper, middle and lower portions of the watershed and expressed as rearing habitat units. For this assessment, the upper portion of the Carmel River is defined as upstream of LPD, the middle portion is between San Clemente Reservoir and LPD and the lower portion is downstream of SCD (Dettman 1990). Only a gross estimate for steelhead abundance is available for the existing reservoirs. 3) The 1990 to 2004 average density of juvenile steelhead in the Carmel River fishery reaches and, 4) Adult steelhead counts in the SCD ladder. The two components of rearing habitat (distribution of juvenile rearing habitat and average juvenile density) are the best data available to make estimates of impacts. However, it should be noted that habitat conditions and juvenile steelhead density can change markedly from year to year, depending on habitat

changes resulting from the magnitude of winter flood events and the flow conditions in the lower river during the dry season.

In the presentation of the following impact mechanisms for fisheries, estimates are provided for the amount of channel affected by construction activities such as dewatering, or by project operations such as sluicing. The evaluation of impacts compares the amount of rearing habitat (length of channel) and an estimated number of steelhead affected by a project activity (Table 4.4-10). The estimated number of juvenile steelhead is based on the average juvenile density data collected by MPWMD. These data are compiled by river reach and expressed as the number of fish per linear foot of channel. The average annual reach density was multiplied by the length of the channel to estimate the juvenile abundance for Reaches 1 through 8. This represents an estimate of the total juvenile abundance for the mainstem Carmel River between LPD and State Highway 1. There is no consistent data to estimate juvenile steelhead abundance upstream of LPD, in the tributaries, or the lagoon in Reach 9. Therefore, the impacts to juvenile abundance based on this data would represent an over-estimate since it does not include all of the habitats supporting steelhead in the river and would represent a conservative estimate relative to the overall impact to juvenile steelhead in the Carmel River.

In regard to the distribution of spawning rearing habitat in the river, the amount of juvenile steelhead rearing habitat available downstream of SCD represents is about 28 percent of the 0+ and 23 percent of 1+ habitat in the watershed according to Dettman and Kelley (1986) (Table 4.4-6). These estimates do not include habitat in Fishery Reaches 3, 7, 8 or 9 (Dettman and Kelley 1986). About 30 percent of the potential spawning habitat in the watershed is available downstream of SCD (Dettman 1990). For the purposes of this analysis, we assumed that about a 30 percent of the spawning habitat in the river and 25 percent of the juvenile rearing habitat (0+ and 1+ combined) in the river occurs downstream of SCD. These percentages provide a point of comparison to assist in evaluating relative effects of the Proponent's Proposed Project to the Alternatives on a river-wide basis. Estimates of steelhead densities and abundance are provided in Table 4.4-10.

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Table 4.4-10: Amount of Habitat and Estimated Number of Rearing Juvenile Steelhead Affected by Construction and Operations for Each Alternative

		Estimated Length of Channel Dried and No. of Steelhead Rescued for each Construction Year or Length of channel affected by Diversion					Estimated SH[f] Affected by Suspended Sediment and Streambed Changes downstream of SCD from construction and operations				% SH Affected by Construction Activities	% of SH Habitat Affected by Construction Activities	% SH Affected by Sus. Sed. from Operations	% Rearing Habitat Affected by Operations
		Reach 3(L)[a]	*Reach 3(U)[a]*	*S.C. Creek[b]*	*Reach 4*	*Tularcitos[b]*	*Reach 4[C]*	*Reach 5[C]*	*Reach 6[C]*	*Reach 7[C]*				
Existing Conditions	Reach Length (ft)	2,200	4,300	1,350	14,950	100	14,950	7,040	19,250	15,300				
	Steelhead reach density (fish per ft)[d]	0.50	0.73	0.50	0.54	0.50	0.54	1.02	1.04	0.91			Total Average SH downstream of LPD =	79,843
	SH Population Estimate[e]	1,100	3,139	675	8,053	50	8,053	7,167	20,020	13,923			Total channel downstream of LPD (ft) =	133,584
Proponent's Proposed Project	Length (ft)	1,200	0	0	500	100	14,950	7,040	0	0				
Steelhead Rescued during Construction	Construction Year 1 (SH)	0	0	0	0	50	2,532	7,167	No Effect	No Effect	0.04	0.1	12.1	
	Construction Year 2 (SH)	600	0	0	269	0	8,053	7,167	No Effect	No Effect	1.0	2.0	19.1	
Steelhead Affected by Operations	Sluicing Operations (SH)	550	N/A	N/A	N/A	N/A	8,053	7,167	20,020	13,923			61.6	42.3
	Water Intake Diversion	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A				
Alternative 1	Length (ft)	2,200	4,300	1,850	500		14,950	7,040	0	0				
	)													
Steelhead Rescued during Construction	Construction Year 1 (SH)	N/A	N/A	N/A	269	N/A	2,532	7,167	No Effect	No Effect	0.2	0.0	12.1	
	Construction Year 2 (SH)	1,100	3,139	675	269	N/A	8,053	7,167	No Effect	No Effect	3.1	5.2	19.1	
	Construction Year 3 (SH)	1,100	3,139	675	269	N/A	8,053	7,167	No Effect	No Effect	3.1	5.2	19.1	
Steelhead Affected by Operations	Sluicing Operations (SH)	550	N/A	N/A	N/A	N/A	8,053	7,167	20,020	13,923			61.6	42.3
	Water Intake Diversion (SH)	3,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Alternative 2	Length (ft)	2,200	4,300	1,850	500		14,950	7,040	0	0				
Steelhead Rescued during Construction	Construction Year 1 (SH)	N/A	500	N/A	269	N/A	2,532	No Effect	No Effect	No Effect	0.6	0.6	3.2	
	Construction Year 2 (SH)	1,100	3,139	925	269	N/A	8,053	7,167	No Effect	No Effect	4.2	4.2	19.1	
	Construction Year 3 (SH)	1,100	3,139	925	269	N/A	8,053	7,167	No Effect	No Effect	4.2	4.2	19.1	
	Construction Year 4 (SH)	1,100	3,139	925	377	N/A	8,053	7,167	No Effect	No Effect	4.3	4.3	19.1	
Steelhead Affected by Operations	Operations (#SH)	N/A	N/A	N/A	N/A	N/A	8,053	7,167	20,020	13,923			**<u>61.6</u>**	**<u>42.3</u>**
	Water Intake Diversion	3,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Alternative 3	Length (ft)	2,200	1,000	1350	500		14,950	7,040	0	0				
Steelhead Rescued during Construction	Construction Year 1 (SH)	N/A	N/A	N/A	N/A	N/A	2,532	No Effect	No Effect	No Effect	0.00	0.0	3.2	
	Construction Year 2 (SH)	1,100	730	675	269	N/A	8,053	7,167	No Effect	No Effect	2.2	2.2	19.1	
	Construction Year 3 (SH)	1,100	730	675	377	N/A	8,053	7,167	No Effect	No Effect	2.3	2.3	19.1	
Steelhead Affected by Operations	Operations (#SH)	N/A	N/A	N/A	N/A	N/A	8,053	7,167	20,020	13,923			**<u>61.6</u>**	**<u>42.3</u>**
	Water Intake Diversion	1,700	N/A	N/A	N/A	N/A								
No Project	Diversion (ft)	0	0	0	0	0	0	0	0	0	0.0	0.0		
	Operations (#SH)	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0

Notes

a Reach 3 is divided in Lower (L) and Upper (U) subreach. For impacts that exceed total Reach 3 length (Alts 1 and 2), abundance is based on Upper Reach 3 density

b Rearing juvenile steelhead density estimated at 0.5 SH/foot of channel for San Clemente and Tularicitos creeks.

c Reach Distance is from Figure 4.4-6

d Average annual steelhead (SH) per linear foot of stream based on reach station during MPWMD fall surveys (Table 4.4-3)

e Abundance is based on long-term average estimate of juvenile standing crop by Fishery Reach downstream of LPD excluding Reach 9 (Lagoon) and tributaries

f Estimated SH is number of steelhead affected within each reach

g Underlined Bolded Text denotes long-term beneficial effects from restoration of sediment transport past the Dam

Impact Mechanisms and Timeframes

Direct impacts are defined as those caused by project activities that occur at the same time and place. Indirect or secondary impacts are defined as those caused by project activities that occur later in time, are one step removed, or removed by distance but are still reasonably foreseeable.

Direct impacts would be expected to occur in the reservoir or stream channels where dewatering occurs to support construction activities such as dam strengthening, demolition, bridge and road construction and sediment removal. Direct impacts would also arise from construction activities that occur outside of the stream channels, along the access roads, in the watershed at sediment disposal sites and downstream of in-channel construction sites. Direct impacts include temporary changes to flow volume, water temperature regimes and turbidity or sedimentation. These changes are evaluated based on the magnitude of change, amount of habitat affected and, duration of time and season(s) over which the event is expected to occur. These effects are evaluated by an analysis of the anticipated extent of changes to temperature, turbidity, suspended sediment, and sedimentation levels in downstream reaches.

Indirect impacts would result from effects that are one-step removed or physically distant from the location of the impact. For example, higher turbidity levels may reduce feeding rates, available food, or invertebrate production that would then affect growth rate in fish. The reduction in the shading provided by riparian vegetation would affect temperature regimes in the river that could affect habitat conditions for juvenile steelhead.

Project activities are identified as having a short-term or long-term impact. Short-term impacts are those that are typically construction related. Long-term impacts are those that endure beyond the construction period. Long-term time frames are defined as those that last from months to years, and also cover events that may occur periodically into the future but may not be continuous.

The following impact issues have been defined for Fisheries:

- FI-1 – Access Route Improvements (short-term alteration of aquatic habitat)
- FI-2 – Dewatering River Channels for Construction Purposes (short-term loss of aquatic habitat)
- FI-3 – Operation of a Trap and Truck Facility at OCRD (removed from analysis)
- FI-4 – Diversion of Carmel River and San Clemente Creek around San Clemente Reservoir for Construction Purposes (short-term loss of aquatic habitat)
- FI-5 – Reservoir Dewatering (short-term loss of aquatic habitat)
- FI-6 – Water Quality Effects on Fish (short-term loss of aquatic habitat)

- FI-7 – Fish Ladder Closure (short-term limiting fish movement past the Dam site)
- FI-8 – Upstream Fish Passage (long-term impact to fish migrating to upstream spawning and rearing habitat)
- FI-9a – Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream (long-term alteration of aquatic habitat)
- FI-9b – Impacts to Fish from Excavation or Dredging of Sediment for Fish Passage (potential juvenile fish entrainment and mortality)
- FI-10 – Relocate CAW Water Diversion Upstream (long-term reduction of flow in reaches of Carmel River between the new diversion point and dam)
- FI-11 – Fish Screen Installation (long-term elimination of entrainment or impingement at the diversion)
- FI-12 – Downstream Fish Passage over SCD (long-term improvement to fish passage over the Dam)
- FI-13 – Stream Sediment Removal, Storage, and Associated Restoration (long-term reduction of aquatic habitat, short-term alteration of aquatic habitat)
- FI-14 – Notching Old Carmel River Dam (OCRD) (short-term loss of rearing habitat, improvement of fish passage)
- FI-15 – Sleepy Hollow Steelhead Rearing Facility (loss or degradation of water supply)

4.4.3 IMPACTS AND MITIGATION

This Final EIR/EIS analysis describes the impacts or benefits associated with the Proponent's Proposed Project, and each alternative, relative to existing conditions. Mitigation actions are described to minimize or compensate for the effects of the project. The analysis evaluates impacts to steelhead through the impact mechanisms which describe the type and magnitude of impact. Any project would require permitting which could involve the adoption of conditions and mitigation measures beyond those identified in the Final EIR/EIS.

One of the requirements for the Proponent's Proposed Project as well as for Alternatives 1, 2, and 3 is the issuance by the USACE of a Clean Water Act Section 404 permit to dredge or fill waters of the U.S. The application for a Section 404 permit for the Proponent's Proposed Project has been filed with the USACE. Section 7 of the ESA requires the USACE to consult with USFWS and NMFS whenever listed species may be affected by the action to be permitted. In this case, the USFWS will be consulted concerning the California red-legged frog, and NMFS will be consulted concerning the California South Central Coast steelhead trout. During this process, the USACE will

prepare BAs for the relevant species and submit them to the respective agency. USFWS, in turn, will prepare a BO for the California red-legged frog and NMFS will prepare a BO for the steelhead. If the action is found not to jeopardize the continued existence of the species, each BO will provide for appropriate mitigation to meet conditions of the Section 404 permit. The USFWS and NMFS each will include an "incidental take" statement as part of the BO if it appears that some of the listed species will be lost as a result of the permitted action. (This ESA consultation process will proceed in parallel with NEPA review). Final Section 404 permit mitigation conditions could be the same as or in addition to any required NEPA/CEQA mitigation; ultimate jurisdiction over the selection, implementation and monitoring of mitigation measures lies with the appropriate federal agency.

Similarly, the Proponent's Proposed Project and Alternatives 1, 2, and 3 will require agreements with the CDFG. Such agreements may contain conditions requiring mitigation that could be the same as or in addition to the NEPA/CEQA mitigation outlined in this report. This section 4.4 addresses NEPA/CEQA mitigation for Fisheries. Vegetation and Terrestrial Species are covered in Section 4.5 and Wetlands in Section 4.6.

4.4.3.1 Proponent's Proposed Project (Dam Thickening)

Issue FI-1: Access Route Improvements

Short-term alteration of aquatic habitat
Determination: ***less than significant with mitigation, short-term, less than significant with mitigation, long-term***

IMPACT

Construction of the bridge across Tularcitos Creek would directly affect aquatic habitat through removal of riparian vegetation during construction year (CY) 3. Road approach and bridge construction would result in the loss of up to 50 feet of riparian vegetation shading along each bank of Tularcitos Creek during Phase 1.

Road improvements along the Carmel River between the Sleepy Hollow Ford and OCRD would affect aquatic habitat through removal of riparian vegetation reducing shading and food resources. Indirect and direct, short-term impacts may be caused by sedimentation and increased turbidity along about a mile of the Carmel River from OCRD downstream to the Sleepy Hollow Ford from road construction, including rock blasting, and widening in CY 3. The Carmel River would not be dewatered to upgrade the piers and bridge deck at the OCRD. Road widening activities along the Carmel River would potentially expose rearing juvenile steelhead along about a third of Reach 4 to short-term minor increases in suspended sediment.

Road construction and widening along the Carmel River between the Sleepy Hollow Ford and OCRD and road construction between the OCRD and SCD would directly and indirectly affect aquatic habitat by the removal of riparian vegetation along the east bank of the Carmel River during CY 3. Reduction of riparian habitat would reduce the amount

of shading along the river and reduce the source of terrestrial insects as a food resource for juvenile steelhead along Reach 4 of the Carmel River for about one mile, affecting about four percent of the habitat downstream of LPD and slightly less than four percent of the juvenile steelhead downstream of LPD (Table 4.4-10). This would be a significant impact.

MITIGATION

Riparian Vegetation

BMPs for riparian vegetation, identified in Appendix U (Botanical Resources Management Plan), would mitigate for some construction activities. Although these measures are typical of those applied to construction activities, they have not received formal approval by NMFS, CDFG, USFWS, CCRWCB, or DWR.

Tularcitos Creek

Water quality would be protected during construction (see Section 4.3 and Appendix K (Storm Water Pollution and Prevention Plan [SWPPP]) for mitigation measures to address sedimentation and turbidity), and the stream margins would be revegetated with native species when construction work is completed as described in Appendix U.

Carmel River

Measures would be taken to minimize effects of blasting for road widening activities (such as falling rock debris) in areas near the channel. Blasting mats and temporary walls would be used to prevent rock fall and blast debris from entering the river channel (see SWPPP, Appendix K) for mitigation measures to minimize sedimentation and turbidity). Tree removal would be limited to only those limbs or trees that require cutting to meet access requirements along the Carmel River between the Sleepy Hollow Ford and the OCRD. Construction of the road from OCRD to SCD would minimize tree removal to the extent practical by careful consideration of road alignment, equipment access routes and laydown areas. Road fill would be needed to raise the access road above frequent flood elevations. The fill would be placed on a fabric or rubber liner on the floodplain. Rip rap or boulders that are too large for the river to move during floods would be used to face the road fill to prevent mobilization of the fill. An erosion control and road drainage plan as described in Appendix K (SWPPP) would avoid or eliminate aquatic impacts due to sedimentation and turbidity. The boulder covering, road-fill and fabric or rubber liner would be removed after access to the base of the Dam was no longer necessary. Disturbed areas would be revegetated if necessary.

The use of blasting mats and temporary walls will substantially reduce the amount of rock material and dust directly entering the Carmel River. Shading and invertebrate habitat is provided by trees along on both sides of the river and by rushes growing on the banks and in the river. Shading is also provided by the steep canyon topography. Tree and limb removal will be minimized by removing only those trees or limbs of trees that are necessary to provide clearance along the access road. Limb removal would

primarily occur on the outside of the riparian zone along the road while river shading is primarily provided by trees or branches overhanging the river. Therefore, limb removal toward the outside of the riparian zone would have minimal effects on overall river shading. Invertebrate input from the canopy would be affected by limb removal since insects from most locations in the riparian zone fly or fall into the river from the canopy overhead. Selective tree and limb removal will minimize the amount of tree canopy removal along the Carmel River. The reduction in overall canopy to the river would be relatively minor because it would involve only a portion of the total canopy along the east side of the river. The canopy along the west side of the channel would not be altered. Afternoon summer shade along the western side of the river is more critical to temperature regulation. Given these mitigations, overall canopy is expected to relatively minor.

The Carmel River between SCD and the Sleepy Hollow Ford contains about four percent of the juvenile steelhead and four percent of the rearing habitat downstream of LPD. Impacts from construction activities to suspended sediment in the river would be confined to the upper sections of Reach 4 and minimized by the use of temporary walls and blast nets. Blasting and rock removal would affect about a mile of river channel downstream of SCD in the short-term. With mitigation this would be a less than significant, short-term impact.

Impacts from tree or limb removal would be occur at localized sites but collectively would affect shading and terrestrial invertebrate input to the Carmel River in Reach 4. The reduction in shade and terrestrial invertebrate input would extend beyond the construction period until the tree canopy recovers and by definition would be a long-term impact. Minimizing tree or limb removal would reduce the effect of shade loss and invertebrate input by reducing the amount of canopy removed during construction. This would be a less than significant, long-term impact.

Issue FI-2: Dewatering River Channels for Construction Purposes

Short-term loss of aquatic habitat
Determination: ***significant, unavoidable, short-term***

IMPACT

Approximately 100 feet of Tularcitos Channel would be dewatered during CY 3 construction for up to eight months for the construction of a new bridge over Tularcitos Creek. A small diversion weir would be constructed upstream of the dewatered reach to direct streamflow into a pipe that would convey through the construction site.

The plunge pool and about 400 feet of channel immediately downstream of SCD would be dewatered to facilitate dam thickening in CY 4. The plunge pool would be isolated from the river by the installation of two downstream cofferdams. A pump would be used to dewater the pool and any channel segments still holding water. The pool would be filled with crushed rock to support the base of a tower crane. The material used to fill the

pool would be removed and the pool restored to pre-disturbance condition once the Dam thickening is complete.

Juvenile steelhead rearing habitat would be lost for a single construction year during the time the channel segments are dewatered. The reach of Tularcitos Creek and the dewatered Carmel River reach both provide rearing habitat for juvenile steelhead that would be lost for one rearing season each. This would be a significant impact because rearing habitat could not be replaced during the construction phase.

Based upon the average juvenile steelhead density for Reach 4 of 0.54 fish per linear foot of channel, rearing habitat supporting about 270 juvenile steelhead would be lost in the plunge pool and 400 feet of channel and the rearing habitat would be lost for a single season. Steelhead present in the Carmel River are listed as a federally threatened species and loss of these fish would be a significant, short-term impact.

MITIGATION

Fish rescues would be undertaken to capture and relocate fish from the affected reaches and relocate them to sections of the Carmel River that would support their growth and development. Fish would be rescued primarily with the use of block nets, seines and dip nets. Backpack electrofishing units would be used if bottom topography makes the use of nets ineffective. Electrofishing would follow guidelines established by NMFS (2000).

Streamflow from the Carmel River upstream of SCD would be directed into appropriately-sized flex pipes and inflowing water would be diverted around the plunge pool and the section of the river to be dewatered. Once flow is diverted out of the channel, water levels would be reduced in the plunge pool and other sections of the river by pumping. Once water levels are lowered in a section of river, a fish rescue would begin and continue until all possible fish are removed from the dewatered reach.

The fish rescue would be completed prior to the complete dewatering of a reach. Field crews would continue to search for stranded fish during the final phases of dewatering. Some fish mortality may occur as a result of the rescue efforts. Capture and handling increases stress and presents a risk of injury.

Captured fish would be temporarily held in aerated coolers for transport to relocation sites. Rescued fish would be transported downstream and released into the Carmel River near the Carmel Valley Filter Plant or moved to the SHSRF if rearing capacity in the release site in the river is already at the maximum capacity. Water quality would be protected during construction (see Section 4.3 and Appendix K for BMPs addressing sedimentation and turbidity). The plunge pool would be restored to its original configuration after CY 4.

While it is difficult to determine whether the loss of fish that are not rescued or that are injured or die during the rescue and relocation operations is significant, the losses along

with the short-term loss of habitat for steelhead cannot be fully mitigated and would be significant.

Issue FI-3: Operation of a Trap and Truck Facility at OCRD

Short-term loss of access for adult steelhead to upstream reaches
Determination: ***Removed from the analysis***

The operation of a Trap and Truck facility has been eliminated from the fisheries impact issues. In the Draft EIR/EIS, operation of the Trap and Truck facility was proposed as mitigation for Fish Ladder Closure (Impact Issue FI-7) which was anticipated to occur in late April or May. Based on regulatory agency input, the earliest that instream construction-related actions could begin is on June 15. Construction activities requiring diversion of the river would begin on June 15 or the first day thereafter when the flow passing San Clemente Dam is 50 cfs or less. This timeframe has virtually eliminated the Fish Ladder Closure Issue. The fish ladder has only operated through June once since 1998.

Additionally, construction could not occur until all inflow to the reservoir can be diverted around the reservoir and released downstream. The planned bypass flow capacity is 50 cfs. The combined restriction of a June 15 (river diversion start date) and at a flow less than 50 cfs means that it is unlikely that the project would affect any upstream migrating adult steelhead. In 1998, the year when 13 adult fish moved upstream in June, flows dropped from approximately 200 cfs on June 1 to about 80 cfs by June 30.

With the calendar date and flow constraints there would be few, if any years when upstream migrating adults would be present in the ladder and there would be minimal, if any impairment to upstream migration. Consequently, a Trap and Truck operation would not be warranted. See Impact Issue FI-7, Ladder Closure, for a more comprehensive discussion of the adult migration issues.

Issue FI-4: Diversion of Carmel River and San Clemente Creek around San Clemente Reservoir for Construction Purposes

Short-term loss of aquatic habitat
Determination: ***significant, unavoidable, short-term***

IMPACT

The Carmel River and San Clemente Creek would be diverted around San Clemente reservoir and dam site. A sheet pile cutoff wall would be used to collect and divert water from the Carmel River and San Clemente Creek into pipes designed to carry up to 50 cfs for the Carmel River and up to 10 cfs for San Clemente Creek. The collected water would be conveyed by the pipes installed parallel to, or in the channels, along both streams to a location about 500 feet downstream of SCD, where flow would be returned to the Carmel River. The intakes of both pipes would be screened consistent with CDFG and NMFS criteria to prevent the entrainment of and to reduce the opportunity for impingement of fish, frogs, and other aquatic organisms.

The diversions would have direct, short-term impacts to rearing habitat upstream of the reservoir, in about 1,200 feet of the inflowing Carmel River, and in less than 100 feet of San Clemente Creek. The diversion intake location on San Clemente Creek would be located near the confluence of the creek with the reservoir. Diversion of water into bypass pipes would affect rearing habitat for up to approximately 600 juvenile steelhead in the Carmel River and a few fish in San Clemente Creek (Table 4.4-10). These impacts would occur during CY 4. This would be a significant, short-term impact.

MITIGATION

Mitigation for dewatering the Carmel River would be similar to mitigations described in FI-2. In addition to actions mentioned in FI-2, fish traps would be installed upstream of diversion points to capture downstream migrating fish so they could be transported around the diversion site and continue their downstream movement. Fish would be rescued from the area of the diversion sites prior to constructing the diversion structures. Once the sheet piles are installed and the diversion pipes connected, water would be diverted into the pipes. Flow in the river channel downstream of the diversion would be reduced and the reduction in flow would facilitate fish rescues. A fish rescue would occur in the Carmel River and San Clemente Creek channels between the diversion point and the reservoir. Block nets would be set near the mouth of each stream to prevent fish from moving upstream of the reservoir. Once all fish were rescued from the channels, all flow would be directed into the bypass pipes. Some fish mortality may occur as a result of the rescue efforts, capture and handling increases stress and presents a risk of injury. See Impact FI-2.

While it is difficult to determine whether the loss of fish that are not rescued or that are injured or die during the rescue and relocation operations is significant, the losses along with the short-term loss of rearing habitat for steelhead cannot be fully mitigated and would be significant.

Issue FI-5: Reservoir Dewatering

Short-term loss of aquatic habitat
Determination: ***significant, unavoidable, short-term***

IMPACT

The reservoir would be lowered from about 525 to 510 feet elevation and sheet piles would be installed in the reservoir around the inoperable mid-level intake gate located 31 feet below the spillway crest. The area between the Dam and the sheet piles would be excavated to expose the intake gate, and the intake gate would be repaired to operating condition.

Lowering the water level to 510 feet would initially create a shallow, warm pool of standing water behind the reservoir with an estimated maximum depth of about five feet. The water level would be lowered to the bottom of the reservoir (approximately 505 feet elevation) once the intake gate was repaired. Construction dewatering would cause

a loss of steelhead and a short-term loss of steelhead rearing habitat in the reservoir during the construction season in CY 4. This would be a significant, short-term impact.

MITIGATION

Nets would be installed across the channels leading into the reservoir to prevent fish from swimming upstream into the Carmel River and San Clemente Creek. A fish rescue would occur in the reservoir during drawdown. Fish would be captured using large and small seines and dip nets. Backpack electrofishing units may be used if needed. Electrofishing would follow guidelines established by NMFS (2000). Rescued fish would be relocated to other suitable habitat downstream of OCRD in the Carmel River. Some fish mortality may occur as a result of the rescue efforts. Capture and handling increases stress and presents a risk of injury. See mitigations under Issue FI-2. During dewatering, water quality in the river would be protected (see FI-6 Water Quality Effects on Fish) and impacts mitigated as described in Section 4.3.

While it is difficult to determine whether the loss of fish that are not rescued or that are injured or die during the rescue and relocation operations is significant, the losses along with the short-term loss of rearing habitat for steelhead cannot be fully mitigated and would be significant.

Issue FI-6: Water Quality Effects on Fish

Short-term alteration of aquatic habitat
Determination: ***less than significant with mitigation, short-term***

IMPACT

Construction activities, river diversions and reservoir dewatering would affect turbidity, DO levels, and temperature in the river downstream of SCD during the summer low flow period. These effects may extend downstream for up to several miles.

Increases in turbidity could occur during installation of seasonal stream diversions, from dewatering stream channels and the plunge pool, from dewatering the reservoir, and from dewatering the reservoir sediment. Increased turbidity would occur during the time of the year when flows are low and the river normally sustains low levels of turbidity.

Increases in temperature could occur as a result of channel dewatering and reservoir dewatering. Reservoir dewatering would result in a shallow, warm pool of water in the bottom of the reservoir for a period before the reservoir is completely empty. Dewatering would occur in the early summer when air temperatures can already be warm.

Decreases in DO levels could occur as a result of dewatering channels and from reservoir dewatering. DO levels would be rapidly moderated by aeration at the release point and when aerated at downstream riffles.

During dewatering of the reservoir, turbidity levels would increase in the reservoir water from the mobilization of fine particulate organic matter and sediment on the reservoir

bed. During dewatering, iron-rich pore water would surface and bring dissolved iron into contact with oxygen in the surface water. The iron would precipitate out in the water column, creating turbidity, and in the process consume oxygen in the water. These factors would increase turbidity in the reservoir water and in water being released into the Carmel River.

Experience from the Interim Dam Safety Measures (annual drawdowns) indicate that turbidity levels are generally less than 10 NTUs (for weeks or months) with short spikes (for hours to days) up to higher levels. The annual drawdowns lowered the reservoir level by 10 feet to elevation 515 and held the reservoir at that level for the remainder of the dry season by discharging inflow via the reservoir through the drawdown ports. The Proponent's Proposed Project would completely dewater the reservoir and divert the inflowing streams around the reservoir via bypass pipes. Once the reservoir is dewatered, there should be no reservoir water source of turbidity.

Turbidity levels in the reservoir are expected to be in the Behavioral or Sublethal Effects range for days to weeks. These effects could impair visual cues affect behavioral interactions and possibly disrupt feeding in the short-term. Turbidity during dewatering could affect Reaches 4, 5, and 6. Turbidity levels would attenuate in a downstream direction with the most pronounced effects in Reach 4 attenuating to minor or undetectable effects in Reach 6. Collectively these three reaches support about 40 percent of the total steelhead in the river and about 30 percent of the rearing habitat in the Carmel River downstream of LPD for days to weeks (Table 4.4-10). This would be a significant, short-term impact.

MITIGATION

Control of turbidity from construction activities on adjacent roads, stream crossings, and bridges is addressed in Section 4.1 and 4.3. Moderating the rate at which the reservoir is dewatered could mitigate turbidity from dewatering. During the annual drawdown, all inflow was allowed to flow through the reservoir and turbidity control was not practical or possible, except by moderating the rate of drawdown. During construction dewatering, the inflow would be piped around the reservoir and released into the downstream channel. The reservoir would be dewatered to 510 feet by pumps then lowered further by reopening the lower level valve. Dewatering would also occur, using well points once surface water is depleted. Releases from the reservoir into the river can be regulated to minimize the effect on downstream turbidity. If reservoir water is highly turbid, it would be treated by running it through a mobile filter plant prior to release to the river. Turbidity effects from the dewatering would be short-term and localized in the river downstream of SCD. Turbidity may affect Reach 4 and some of 5, but the ability to regulate and treat the release of highly turbid water from behind SCD would mitigate the effects to the river. Aerating the water prior to release into the river would mitigate decreased DO levels. Cooling the water prior to release into the river would mitigate increased temperatures.

Turbidity caused by dewatering the plunge pool would be regulated by the rate at which the plunge pool is pumped down. Typically, the highest turbidity occurs near the end of the dewatering process. It would also be possible to treat this water prior to release into the river in the same manner that the water in the reservoir would be treated.

Water temperature increases would be mitigated by dewatering the reservoir as much as possible during cool periods or during the early part of the day. As the water level is lowered and surface water temperatures rise during the day, dewatering would switch from a surface release to a release from well points. Surface water releases would be restricted to cooler periods at night or early in the day. River temperatures downstream of the Dam should not increase by more than 1 to 2 ºC over water temperature levels upstream of the sheet-pile diversion.

Reducing thermal loading in diversion pipes around the reservoir would be accomplished by placing the pipeline in locations that are shaded, burying the pipe beneath a shallow layer of sand or covering the pipe with shade cloth or burlap. The pipe would be painted white where it is not possible to shade or bury it.

DO levels would be mitigated through aerating the water either as it leaves the diversion pipes or with a mechanical aerator prior to releasing pumped or treated water into the river. Low DO levels in the reservoir would quickly moderate from water falling over the Dam. During bypass operations for the river, the design shall incorporate a feature that would aerate the water as it descends from the Dam to the river. The reservoir dewatering would make use of the surface release to aerate water. Water that is pumped from the reservoir or from well points would be discharged in a similar manner to fully aerate low DO water prior to discharge into the river.

While a substantial number of fish could be exposed to increased turbidity and water temperatures and reduced DO levels, the actions proposed would fully mitigate for the impacts. The level of impacts is mitigable to less than significant and any residual impact would be a short-term effect on the fish. Therefore the impact is less than significant with mitigation.

Issue FI-7: Fish Ladder Closure

Short-term limiting fish movement past the Dam site
Determination: ***less than significant, short-term***

IMPACT

Dewatering the reservoir during CY 4 may result in temporary closure of the fish ladder for a period of days to weeks toward the end of the migration season. Closure of the ladder would result in direct, temporary effect on adult steelhead in the Carmel River by stopping migration at the Dam. Based on migration information, the number of adult steelhead potentially affected by ladder closure could range from 0 to 13 fish during all of June (Table 4.4-2).

Construction would not begin until the Carmel River is diverted around the work area. The bypass system for the project can handle about 50 cfs, so reservoir dewatering and construction would not begin until the flows in the river at SCD are at 50 cfs or less. Flows would be diverted into the bypass pipes and the ladder would be closed. Bypass pipes would be designed to carry 50 cfs on the Carmel River and 10 cfs on San Clemente Creek. Construction activities requiring diversion of the river would begin on May 15 or the first day thereafter when flow passing San Clemente Dam is 50 cfs or less. The flow conditions and calendar start date imply it would be unlikely that any adult fish would still be moving up the river when the ladder would be closed. The ladder is usually closed in early to late May when flows recede in the river and the mouth closes. The ladder has operated in June only one year out of 15. In 1998 (a wet year) the fish ladder was able to operate in June when flows at the beginning of the month were well over 200 cfs (Figure 4.4-5).

Given these natural constraints, it is unlikely that the Proponent's Proposed Project would have any effect on upstream migrating adult steelhead. An analysis of the most recent 15 years of ladder operations shows that the ladder operation occurred during the May 1 to 15 period in 10 out of 15 years; during the May 16 to 31 period in 7 out of 15 years and occurred only for one year after June 1. A total of 21 fish ascended the ladder in May and June of 1998, the highest count of all the years for operations continuing after May 1 and represented 2.3 percent of the adult run for that year (Table 4.4-2). A total of 13 fish ascended the ladder in June of 1998 representing 1.5 percent of the adult run, and 8 fish representing 0.9 percent of the 1998 run ascended the ladder between June 16 and 30. The largest number of fish that ascended the ladder in May occurred in 1996 and 1997 when 11 fish ascended the ladder each year representing 2.5 percent of the run in 1996 and 1.4 percent of the run in 1997. In 1999 no fish entered the ladder in May and no fish entered the ladder during second half of May when it was operating in 2002 or 2005 (Table 4.4-2).

During the ten years that steelhead were counted in the ladder in May and/or June, a total of 59 fish passed up the ladder, representing 1.4 percent of the total of 5,609 fish that were counted in the ladder for those years (Table 4.4-7). While ladder closure may affect some fish, based on available data, ladder closure on May 31st for a single year would not prevent or interfere substantially with the movement of any native resident or migratory fish species.

In the Draft EIR/EIS, a Trap and Truck facility plan was proposed as a mitigation measure for fish that might pass through the ladder during May and June when the reservoir was being dewatered. The migration is essentially over when river diversion activities start after May 31. The level of impact to migrating adult steelhead from ladder closure would be less than significant. Therefore, the impact is less than significant, short-term. This is a change from the Draft EIR/EIS because of the date for stream diversion to begin has been deferred several weeks.

Issue FI-8: Upstream Fish Passage

Long-term impact to fish migrating to upstream spawning and rearing habitat
Determination: ***beneficial with mitigation, long-term***

IMPACT

The existing ladder would be demolished and a new vertical slot ladder would be constructed. Operation of the new ladder would improve passage conditions at SCD compared to the existing ladder for several reasons. The new ladder would increase the attraction flow at the ladder, would have more steps, which would reduce the height between steps compared to the existing ladder, and would have larger pools providing better resting habitat and the ladder design is a vertical slot design which would enable swim-through passage rather than the leaping passage between steps required by the existing ladder. Upstream passage would be improved since all flows less than 55 cfs would be conveyed down the ladder and not over the spillway. The present ladder can pass only 10 cfs. During spills, the ladder would carry up to about 77 cfs and would continue to provide upstream fish passage. The ladder could become impaired by sediment and debris transported from upstream and by the deposition of sediment behind The Dam and upstream of the ladder. The operation of a sluice gate could result in fallback of adult fish that have ascended the ladder and are entrained in the flow during sluice gate operation.

Operation of the new ladder would improve passage conditions at SCD, and would be a beneficial impact compared to existing conditions.

MITIGATION

The sluice gate would be operated under the protocols of the SOMP (Appendix J). The 10-foot diameter sluice gate would be installed near the ladder entrance and periodically operated to keep the ladder free of sediment and maintain passage conditions upstream of the ladder. Sluicing operations are defined in the SOMP, and sediment impacts are discussed in Issue FI-9a. Sluicing or dredging would occur as needed to maintain the ladder free of sediment and provide for passage through upstream river channels for adult fish. Sediment management would occur on a preventative basis under appropriate flows. Dredging and excavation would occur during low-flow periods. Sluicing would only occur on the rising limb of an early winter storm event. A gate would be installed on the upstream end of the fish ladder to prevent fish from moving out of the ladder before and during sluice gate operation. The fish ladder exit would be closed for a period of time before the sluice event begins. Fish would not be able to exit the upstream end of the ladder when the gate is closed which includes a period prior to and during the sluice event. Following completion of a sluice event, flows would again spill over the Dam. The gate at the upstream end of the ladder would be reopened to allow passage into the remnant reservoir and to access upstream river channels. Fish that are in the remnant reservoir prior to operation of the sluice gate could be subject to fallback through the sluice gate. The ladder would be closed prior to operation of the sluice gate to allow fish that had exited the ladder to move upstream away from the sluice gate. The

sluice gate would be partially opened to eliminate resting habitat near the ladder exit and encourage steelhead in the remnant pool to move upstream away from the gate prior to fully opening the sluice gate. A few adult fish may be subject to fallback during the 2 hour period when the gate is fully open. Because of the changing nature of the Carmel River's flows and the experimental nature of early sluice gate operation, the SOMP is an adaptive management plan that would be modified by the Fish Passage Management Committee composed of representatives from CAW, NMFS, CDFG, and MPWMD.

With mitigation, the new ladder and sluice gate operations, would improve upstream fish passage conditions at SCD and would have a beneficial effect compared to existing operations.

Issue FI-9a: Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream

Long-term alteration of aquatic habitat
Determination: ***less than significant, long-term, no mitigation required***

Issue FI-9 as identified in the Draft EIR/EIS has been designated as FI-9a in the Final EIR/EIS to separate the analysis of downstream sediment impacts from sluicing, dredging, or sediment transport from the impacts to fish due to excavation or dredging in the remnant reservoir for fish passage (presented as Issue FI-9b).

IMPACT

This impact was listed as FI-9 in the Draft EIR/EIS and had the impact determination “significant unavoidable.” Based on the additional analyses on suspended sediment levels from sluicing to downstream channels that was conducted in response to comments, the impact determination has been changed to “less than significant.” The additional studies are presented earlier in this section and the results are further discussed in the following paragraphs.

The Proponent’s Proposed Project would retain the Dam and construct an improved fish ladder. Sediment has nearly filled the reservoir at SCD and is expected to fill the reservoir to the spillway elevation in 6 to 10 years. Fine sediment would begin spilling over the Dam during large flow events. Initially, only fine sediment would be delivered to the downstream river reaches. However, substrate size is expected to increase to include gravel-sized material within 12 to 20 years. An estimated average 16.5 AF of sediment is delivered to the San Clemente reservoir area annually and about 12 AF of that sediment would be transported downstream (MEI 2003).

In order to keep an open channel between the top of the fish ladder and the upstream river, construction and operation of a sluice gate would be employed. The sluice gate would be 10 feet in diameter and situated so the opening would be about 10 feet from the entrance to the fish ladder. The bottom of the sluice gate would be about 2.7 feet below the invert elevation of the fish ladder. The sluice gate would be operated

according to protocols set forth in the SOMP (Appendix J). Sluicing events would only occur during winter storm runoff when the river is already turbid from high flows. Adequate fish passage conditions are defined as a minimum of one foot of depth in the channel upstream of SCD.

Sediment management protocols employ dredging or excavation during low flow periods to avoid sluicing under these conditions to provide for fish passage in advance of the time when storm flows in the river flow reach 300 cfs. Under the sluicing protocols, sediment sluicing operations would open the sluice gate for two hours and release about 2.4 acre feet of sediment. This would cause a short-term increase in the suspended sediment load of fine-to-coarse sand-sized material to the river. No alteration of water temperature would be expected from sluicing operations.

The change in suspended sediment delivered to the lower river for existing conditions and the Proponent's Proposed Project would remain in the Sublethal Effects Level with SEV scores of 7 to 8 in all reaches downstream of SCD for a typical wet year sluice event (Table 4.4-9). The Sublethal Effects Level would include reduced feeding success, delayed hatching and indications of physiological stress and poor condition (Newcombe and Jensen 1996).

Subsequent flows of 300 cfs or more following closure of the sluice gate have adequate transport capacity in the Carmel River downstream of SCD to fully mobilize the sluiced sediment and move it downstream (Appendix S). Organisms in the river downstream would experience periods of increased suspended sediment as the material passes downstream. Graphic analysis of suspended sediment concentrations show a rapid increase in suspended sediment in Geomorphic Subreach 4.3a with attenuation of the peak and dispersal downstream to subreaches 4.3b and 4.3c (Appendix O Figures 11 to 14) for a wet year sluice event. The dry year sluice event shows a somewhat similar behavior but because of lower flows following the sluice event, suspended sediment levels would stay elevated in Subreach 4.3b and 4.c at the end of four days (Appendix O Figures 25 to 28).

Suspended sediment concentrations would increase in Subreach 4.3 (upstream section of Fishery Reach 4) for about 2-3 days (Figure O-1, Appendix O), and in Fishery Reaches 5, 6, and the upper half of 7 of the Carmel River compared to 2030 Baseline Conditions. Suspended sediment effect levels remain the same for the Proponent's Proposed Project compared to the existing conditions for subreaches 4.3, 6.3, 6.7, 7.3, 7,7 and 9, and does not change the effect level from sublethal. Suspended sediment effect levels are the same with slightly higher concentrations but similar duration (See Figures O-3 through O-9, Appendix O) with an SEV of 8 for the Proponent's Proposed Project compared to the 2030 Baseline for subreaches 6.3, 6.7, 7.3, 7.7 and 9. Suspended sediment effect levels are 8 for the Proponent's Proposed Project compared to 7 for the 2030 Baseline in Subreach 4.3 (higher concentration, similar duration see Figures O-1 and O-2) but this does not change the effect level from sublethal.

Suspended sediment would affect fishery reaches 4, 5, 6, and, 7 with the greatest effects on Fishery Reach 4 and progressively lesser effects to downstream sites.

The analysis based on a change in Effects Level indicate that the effects from suspended sediment released by sluicing under the Proponent's Proposed Project are similar to effects of background levels of suspended sediment that already occur in the river during high flow events or would be expected to occur in the river under the 2030 Baseline condition (with the reservoir completely full of sediment except for a remnant pool).

Impacts from exposure to suspended sediment from the Proponent's Proposed Project to downstream resources are similar to impacts that occur during storm events under the 2030 Baseline and therefore are less than significant long-term.

Issue FI-9b: Impacts to Fish from Excavation or Dredging of Sediment for Fish Passage

Potential juvenile fish entrainment and mortality
Determination: ***less than significant, long-term***

IMPACT

In response to comments, since issuance of the Draft EIR/EIS, the SOMP (Appendix J) has been expanded to include other methods for managing sediment, in addition to sluicing. Mechanical sediment removal using a suction dredge or an excavator would be employed to maintain fish passage upstream of the ladder when sluicing sediment is not possible because of potential downstream impacts. Excavation or dredging would be conducted under low flow conditions and not during periods of peak steelhead migration. Recently deposited fine grained substrates impeding fish passage would be removed from the area upstream of the ladder.

Suction dredging can entrain and kill small fishes and invertebrates, degrade benthic habitat, and increase turbidity in a localized area. The bottom habitat that would be dredged consists of a generally flat bottom of fine sediments that have recently accumulated behind the Dam and would be of very poor habitat quality. These fine sediments would support very low invertebrate productivity and collectively the area would provide very poor rearing habitat. Excavation with a mechanical excavator could kill fish by striking them with the bucket, capturing fish in the bucket or exposing fish in the area of the excavation to turbulence and localized elevated turbidity. During dredging or excavation, flow through the fish ladder would be minimized and most of the flow would be spilled over the Dam. Reducing flow into the ladder would minimize the amount of suspended sediment from removal activities from entering the ladder flow. While there is a potential for juvenile steelhead to be entrained in the suction dredge and killed, this potential is very low. The intake for the dredge is operated in the substrate and would rarely encounter steelhead. Additionally, juvenile and adult fish are known to easily avoid suction dredges (Harvey and Lisle 1998). Juvenile steelhead are not likely to be found in the area to be excavated because habitat conditions would be

very poor, water depth would be shallow, substrate would be sand, velocities would be low, and the area would be devoid of cover.

Given the poor habitat for steelhead in the area requiring dredging, the ability of steelhead to avoid suction dredges and/or a bucket, the low probability of encountering steelhead in the area, and excavation activities that would only occur for a period of days, this would be a less than significant, long-term impact.

Issue FI-10: Relocate CAW Water Diversion Upstream

This issue does not apply to the Proponent's Proposed Project.

Issue FI-11: Fish Screen Installation

Long-term elimination of entrainment or impingement at the diversion
Determination: ***beneficial, long-term***

IMPACT

A new fish screen meeting NMFS and CDFG criteria would be installed at the intake in SCD. The intake would be moved to a location that would be in proximity of the sluice gate. The fish screen would eliminate entrainment into the diversion and minimize impingement. Sluice gate operation for fish passage as described in FI-9a (Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream) would also maintain the intake in operational condition.

MITIGATION

The impact of the fish screen is beneficial; no mitigation is required. Mitigation for the sluice gate operation is described in Issue FI-9a.

Issue FI-12: Downstream Fish Passage over SCD

Long-term improvement to fish passage over the Dam
Determination: ***beneficial, long-term***

IMPACT

The spillway would be modified by raising the elevation of the two lateral spillway bays by 0.5 feet relative to the center bay. Spillways would be extended to directly spill into the plunge pool, and not strike the thickened dam face. During low flows, all surface flow would be carried through the fish ladder (up to 55 cfs). At flows above 55 cfs, surface flow would begin to spill through the center spillway bay. For stream flows in the range of approximately 55 to 115 cfs, most of the flow (55 to 62 cfs) would pass through the ladder. The remaining flow would spill over the lower, center spillway (elevation 525.0). Above stream flows of approximately 115 cfs, spill would also occur at the higher two spillway segments (elevation 525.5 feet). This configuration provides an increased depth of flow during lower flows compared to the existing spillway and ladder configuration. The new spillway bays would be equivalent to or better than the existing spillway bays for fish passage. Fish passing over the Dam would fall about 65 feet into

the plunge pool, as they do under existing conditions. The new fish ladder would pass all flows up to about 55 cfs, reducing the amount of time the reservoir spills and providing safer passage down the ladder. The ladder would continue to operate during higher flows and would carry up to about 77 cfs when river flow volume is about 700 to 800 cfs or higher. Sluicing events would occur as needed and be consistent with conditions in the SOMP (Appendix J) when it is necessary to mobilize sediment from upstream of the dam and fish ladder. Sluicing would occur for up to 2 hours during storm flows of 300-700 cfs. During the sluice event nearly all flow would pass through the sluice gate with a small volume of flow going down the ladder. Juvenile and adult fish entrained in the sluice event would pass downstream through the sluice gate into the plunge pool. Water levels behind the dam would drop below the level of the spillway during the sluice event preventing juvenile and adult fish from passing through the spillway bays. There is potential for juvenile and adult fish passing downstream through the sluice gate and into the plunge pool to become injured by the turbulence and shear zones as they enter the plunge pool. Potential injury from downstream passage while sluicing is occurring is not expected to be substantially different from potential injury that would occur as a result of passage through the spillway bays and the fall into the plunge pool. This would be a beneficial, long-term impact.

MITIGATION

Spillway and fish ladder modifications described above would improve downstream fish passage compared to existing conditions. No mitigation is required.

Issue FI-13: Stream Sediment Removal, Storage, and Associated Restoration

Sediment removal is not a component of the Proponent's Proposed Project and no stream restoration would occur. Except for local removal of sediment for construction purposes, existing conditions would be unchanged. Table 4.4-11 provides a summary of changes to fish habitat and changes to lengths of channel by alternative.

Table 4.4-11: Summary of Channel Length Changes for the Proponent's Proposed Project and Each Alternative Upstream of San Clemente Dam

	Habitat Changes		Gain or Loss of Channel Length		
	San Clemente Creek	Carmel River	San Clemente Creek	Carmel River	Net Change
Existing Conditions	1,350 feet of channel, creek mouth is 850 feet U/S from SCD*	6,500 feet of channel, river mouth is 200 feet U/S from SCD	No Change	No Change	0ft
Proposed Project	No change	No Change	0 feet	0 feet	0 feet
Alternative 1 Dam Notching	Remove sediment in San Clemente Creek arm to a depth of 20 feet; remove 1,350 feet of existing SCC channel. Reconstruct 2,200 feet of SC Creek channel on new sediment surface.	Remove sediment in Carmel River arm to a depth of 20 feet, remove 6,500 of existing CR channel, Reconstruct 6,700 feet of new CR channel on new sediment surface	Gain 850 ft of channel length	Gain 200 feet of channel length	Gain 1,050 feet of channel length
Alternative 2 Dam and Sediment Removal	Remove all sediment in San Clemente Creek arm to valley bottom; remove 1,350 feet of existing SCC channel. Reconstruct 2,200 feet of SC Creek channel in new valley bottom.	Remove all sediment in Carmel River arm to valley bottom, remove 6,500 of existing CR channel, Reconstruct 6,700 feet of new CR channel in new valley bottom	Gain 850 ft of channel length	Gain 200 feet of channel length	Gain 1,050 feet of channel length
Alternative 3 Reroute and Dam Removal	Remove all sediment in San Clemente Creek arm to valley bottom; remove 1,350 feet of existing SCC channel. Reconstruct 2,200 feet of Carmel River Channel through San Clemente Arm in valley bottom.	Abandon 3,000 feet of Carmel River Channel, construct 450 feet of bypass channel and connect with San Clemente Arm channel.	Loss of 1,350 feet of channel length	Old Channel length was 3,000 feet, new channel constructed is 2,650 feet, = loss of 350 feet channel	Loss of 1,350 feet of San Clemente Creek and 350 feet of Carmel River. Net loss of 1,700 feet of channel.
Alternative 4 No Project	Same as Existing conditions		Same as Existing Conditions		

* all distances measured from dam to upstream extent of former Inundation Zone and assumes 850 ft for San Clemente Creek and 200 ft for Carmel River beneath the reservoir.

Issue FI-14: Notching Old Carmel River Dam

Short-term loss of rearing habitat, Improvement of fish passage
Determination: ***short-term, less than significant; long-term, beneficial***

IMPACT

The OCRD would be notched in CY 3. Sheet piles would be installed upstream and downstream around the central portion of the Dam. The sheet pile installation will isolate the demolition area from the river so the plunge pool downstream of the OCRD would not be dewatered and the river would not be diverted around the site. Once the sheet piles have been set, the water on the downstream side would be pumped out and bed material from the upstream side of the Dam would be excavated as the Dam is notched. Flow in the river in the late summer or early fall would be on the order of 10 cfs or less. During CY 3 or CY 4, steelhead captured from the upstream work at SCD and reservoir would be released well downstream of OCRD (See FI-2, FI-4, and FI-5). This would minimize the number of steelhead in the river at OCRD.

In the Draft EIR/EIS, mitigation was proposed for this impact which would include fish rescue activities because of dewatering of the plunge pool downstream of the OCRD. However, current plans would not involve dewatering of the pool below OCRD. Impacts would be minimal due to: late season low flow conditions; minimal disruption in the river channel from isolating the work using sheet piles; the short duration of the project; and because juvenile steelhead migrating downstream would be moved to river sites well below OCRD for the summer period preceding dam notching work at the OCRD. Construction of the notch would result in a less than significant, short-term impact. Notching would remove a large center section of the Dam and eliminate a passage barrier and would be long-term benefit.

MITIGATION

No Mitigation is required. This would be a less than significant short-term impact and notching would result in a long-term benefit.

Issue FI-15: Sleepy Hollow Steelhead Rearing Facility

Loss or degradation of water supply
Determination: ***less than significant with mitigation, long-term***

IMPACT

The SHSRF depends on Carmel River water to operate from early summer to winter or early spring. Construction and operation of the Proponent's Proposed Project could result in water of poor quality, (high turbidity, low DO, or warm temperatures) during CY 3 and 4 and during operations into the future. Road construction, dewatering the plunge pool, diverting water around the reservoir and dewatering the reservoir could affect water quality at the SHSRF. Sediment delivered to the river below SCD from sluicing or from sediment transported over the Dam could affect water quality for the SHSRF. This would be a significant long-term impact.

MITIGATION

An alternative water supply would be made available to the SHSRF. Water can be pumped up from the Russell Wells and be made available to the SHSRF as an

alternative water supply during construction years, or during periods of excessive turbidity or sediment levels in the Carmel River. With mitigation, this would be a less than significant, long-term impact.

4.4.3.2 Alternative 1 (Dam Notching)

Aquatic biology and fisheries impacts and mitigation for Issues FI-3 (Operation of Trap and Truck Facility at ORCD), FI-6 (Water Quality Effects on Fish), FI-8 (Upstream Fish Passage), FI-9a (Sediment Impacts to Downstream Channels from Sluicing, Dredging, or Sediment Transport Downstream), FI-9b (Impacts to Fish from Excavation or Dredging of Sediment for Fish Passage), FI-11 (Fish Screen Installation) and FI-15 (Sleepy Hollow Steelhead Rearing Facility) would be the same as described for the Proponent's Proposed Project. Issue FI-14 (Notching Old Carmel River Dam) would be the same as described for the Proponent's Proposed Project except notching would occur in CY 6.

Issue FI-1: Access Route Improvements

Access route improvements (short-term alteration of aquatic habitat)
Determination: ***less than significant with mitigation, short-term***

IMPACT

The existing San Clemente Drive would serve as a secondary access road to reach the Dam. No Tularcitos Access Road would be constructed. Road improvements would be similar along the Carmel River between the Sleepy Hollow Ford and the OCRD and between the OCRD and SCD therefore impacts would be similar to the Proponent's Proposed Project for FI-1 except there would be no Tularcitos Creek impacts.

The main access route would be via Carmel Valley Road and Cachagua Grade then via the improved Jeep Trail to the sediment disposal area. A new temporary road will be constructed to access the reservoir. The Cachagua Access Route is located some distance from the river. Access to the reservoir would not occur until it was dewatered. Therefore there is no impact from this access route.

MITIGATION

Mitigation would be similar to the Proponent's Proposed Project but to a lesser extent because access route improvements under Alternative 1 would not include impacts to Tularcitos Creek and the associated riparian habitat. With mitigation, this would be a less than significant, long-term impact.

Issue FI-2: Dewatering River Channels for Construction Purposes

Short-term loss of aquatic habitat
Determination: ***significant, unavoidable, short-term***

IMPACT

The plunge pool immediately downstream of SCD would be dewatered to facilitate dam notching in the same manner as in the Proponent's Proposed Project except that it would occur during CY 4 and would not involve Tularcitos Creek.

MITIGATION

Mitigation actions are the same as the Proponent's Proposed Project FI-2 (Dewatering River Channels for Construction Purposes), except they would not include Tularcitos Creek and would occur in CY 4.

While it is difficult to determine whether the loss of fish that are not rescued or that are injured or die during the rescue and relocation operations is significant, the losses along with the short-term loss of habitat for steelhead cannot be fully mitigated and would be significant.

Issue FI-4: Diversion of Carmel River and San Clemente Creek for Construction Purposes

Short-term loss of aquatic habitat
Determination: ***significant, unavoidable, short-term***

IMPACT

Impacts would be similar to those described for the Proponent's Proposed Project Impact FI-4 (Diversion of Carmel River and San Clemente Creek for Construction Purposes), but diversions would occur over longer distances and for two consecutive construction years.

The diversions would have direct, short-term impacts to rearing habitat upstream of the reservoir for about 5,200 feet in the Carmel River and for about 1,350 feet in San Clemente Creek during CY 4 and CY 5. This would affect rearing habitat for up to about 3,480 juvenile steelhead in the Carmel River and 600 juvenile steelhead in San Clemente Creek, or about 3.1 percent of juveniles in the river and represent about 5.2 percent of the habitat downstream from LPD (Table 4.4-10). These impacts would occur for two years during CY 4 and CY 5 and would be short-term, significant impacts.

MITIGATION

Mitigation measures would be the same as for the Proponent's Proposed Project, except fish rescues would occur for two consecutive years along 5,200 feet of the Carmel River and 1,200 feet of San Clemente Creek upstream of the Dam.

While it is difficult to determine whether the loss of fish that are not rescued or that are injured or die during the rescue and relocation operations is significant, the losses along with the short-term loss of habitat for steelhead during 2 construction years cannot be fully mitigated and would be significant.

Issue FI-5: Reservoir Dewatering

Short-term loss of aquatic habitat
Determination: ***significant, unavoidable, short-term***

IMPACT

Impacts would be similar to those described for the Proponent's Proposed Project, and would include lowering the reservoir approximately 21 vertical feet to facilitate sediment removal and dam notching. Lowering the water level to 504 feet would completely dewater the reservoir. The reservoir would be dewatered three times, once in CY 4, 5,and 6. The reservoir would store about 500 AF of water between CY 4, 5, and 6 and would affect hydrology of the Carmel River in late fall/early winter (see Section 4.2 Hydrology). These hydrologic effects would occur during reservoir filling and again in the spring during the dewatering and would affect movement of steelhead in the Carmel River. At the beginning of the wet season there would be about 500 AF of storage in the reservoir that would need to be filled before the Dam would spill. In the spring months, the 500 AF in storage would be released through the drawdown ports or the slide gate at the 494-foot elevation, increasing flows for a short time in the river downstream of SCD. Flows would be managed to begin bypass flow around the reservoir by May 31^{t} or the first day when the flow passing San Clemente Dam is 50 cfs or less and dewatering of the reservoir would begin soon after.

Direct, temporary impacts to fish in the reservoir would occur from draining the reservoir CY 4, 5, and 6. The reservoir would store up to 500 AF of water at the end of year four and would affect flows in the lower river from one day to eight weeks depending on the water year type until the reservoir fills (ENTRIX 2000). Release of the 500 AF during the start of CY 5 would occur at a time when some adult steelhead would be actively moving downstream.

The direct effects to aquatic habitat during reservoir dewatering would create significant, unavoidable impacts to steelhead resources in the San Clemente Reservoir, resulting in a loss of rearing habitat in the reservoir during CY 4, 5, and 6 Impacts would occur for three consecutive construction seasons and result in greater impacts than the Proponent's Proposed Project. This is a significant, short-term impact.

MITIGATION

Mitigation measures would be the same as for the Proponent's Proposed Project, except that fish rescues would occur for two consecutive years. Mitigation for operation of a 500 AF reservoir would be provided by maintaining upstream passage through the fish ladder through May 31 or the first day when the flow passing San Clemente Dam is 50 cfs.

While it is difficult to determine whether the loss of fish that are not rescued or that are injured or die during the rescue and relocation operations is significant, the losses along with the short-term loss of habitat for steelhead for three construction years cannot be fully mitigated and would be significant.

Issue FI-7: Fish Ladder Closure

Short-term limiting fish movement past the Dam site
Determination: ***less than significant, short-term***

IMPACT

See issue FI-7 under the Proponent's Proposed Project for a discussion of the issues and analysis of the impacts. Under Alternative 1, the fish ladder would be closed near or after the end of the migration season in CY 4, 5, and 6. This would be a less than significant, short-term impact.

Issue FI- 8: Upstream Fish Passage

Long-term impact to fish migrating to upstream spawning and rearing habitat
Determination: ***beneficial with mitigation, long-term***

IMPACT

The existing ladder would be demolished and a new, shorter vertical slot ladder would be constructed. Impacts associated with operation of the new ladder are the same as those presented under the Proponent's Proposed Project, except that the ladder would be reduced in length by about 19 vertical feet. The ladder would be operated consistent with the SOMP in Appendix J.

Operation of the new ladder would improve passage conditions at SCD and would be a beneficial impact compared to existing conditions.

MITIGATION

Mitigation is the same as describe in FI-8 for the Proponent's Proposed Project. This would be a long-term benefit.

Issue FI-10: Relocate CAW Water Diversion Upstream

Long-term reduction of flow in reaches of Carmel River between the new diversion point and dam
Determination: ***less than significant with mitigation, long-term***

IMPACT

Relocating the water supply diversion intake 7,200 feet upstream on the Carmel River from current dam site would reduce flow in the river between the diversion intake and the Dam site compared to existing conditions. Downstream flows (below the Dam) would not be affected by this change. This would be a significant long-term impact.

MITIGATION

Minimum flows are addressed in the current MOU between MPWMD, CDFG, NFMS, and CAW. Minimum flows are based on available upstream storage in Los Padres Reservoir, the water year type and water demand. A similar plan would be developed in conjunction with NMFS Fisheries, CDFG, SWRCB, and the MPWMD to provide flows

for steelhead habitat in the reach of the river affected by the new point of diversion. Terms of the new plan would avoid impacts to the river resulting from moving the diversion upstream. With this mitigation, relocation of the CAW water diversion would have a less than significant long-term impact.

Issue FI-12: Downstream Fish Passage over SCD

Long-term improvement to fish passage over the Dam
Determination: ***beneficial, long-term***

IMPACT

The improved ladder would be similar to the ladder improvements for the Proponent's Proposed Project. The Dam would be lowered by about 20 feet and the height of the fall would be reduced from about 65 feet to 45 feet. This would be a benefit to downstream passage. The notch would be cut in the Dam at an elevation where the Dam is thicker resulting in a longer spillway. Passing through a longer spillway would increase exposure of fish to potential contact with the spillway surface. Direct long-term impacts to fish passing over the Dam would occur from abrasions against the spillway as they pass downstream. The shorter drop to the plunge pool would be an improvement compared to existing conditions and the Proponent's Proposed Project; however, the fall to the plunge pool may still injure or kill some larger fish. However, the overall impact would still be beneficial, long-term.

MITIGATION

The reduced height from the Dam crest to the plunge pool is an improvement compared to existing conditions and to the Proponent's Proposed Project. A low flow channel would be created within the notched spillway to increase depth of flow and reduce the potential to contact the spillway surface. The new, shorter ladder would pass a greater volume of flow and reduce the amount of time that flow would move spill over the Dam.

This would be a long-term benefit.

Issue FI-13: Stream Sediment Removal, Storage, and Associated Restoration

Long-term reduction of aquatic habitat, short-term alteration of aquatic habitat
Determination: ***significant, unavoidable, short-term, less than significant with mitigation, long-term***

IMPACT

Approximately 6,500 feet of the Carmel River and about 1,350 feet of San Clemente Creek would become unavailable as rearing habitat for the three years it would take to remove sediment from the reservoir and notch the Dam. Existing channels would be eliminated during CY 4 as sediment is removed from the inundation area. Sediment removed from the reservoir would be stored at Site 4R – area upland and away from the reservoir and river. The channels would be flooded during the winter between CY 4 and

CY 5. During CY 6, geomorphically appropriate channels would be reconstructed and re-vegetated in about 6,700 feet of the Carmel River and 2,200 feet of San Clemente Creek (Table 4.4-11). The long-term loss of steelhead habitat would be an unavoidable significant impact.

MITIGATION

New channels for the Carmel River and San Clemente Creek would be reconstructed through the newly exposed sediments. The channels would be rebuilt with gravel, cobble and boulder materials salvaged during sediment removal. Channels would be geomorphically appropriate to the new valley gradient and substrate sizes. The channels would be re-vegetated with native trees and shrubs. Approximately 6,700 feet of channel would be constructed in the Carmel River and about 2,200 feet in San Clemente Creek. Full recovery to functional channels may take from 3 to 7 years after restoration is completed. Because the impact lasts beyond the construction period, this would be a significant, long-term impact. Following full recovery, the impact would be reduced to less than significant.

4.4.3.4 Alternative 2 (Dam Removal)

Aquatic and fisheries impacts and mitigation for Impacts and mitigation for Issues FI-3 (Operation of a Trap and Truck Facility at ORCD), FI-6 (Water Quality Effects on Fish), FI-11 (Fish Screen Installation) FI-14 (Notching Old Carmel River Dam), and FI-15 (Sleepy Hollow Fish Rearing Facility) would be the same as described for the Proponent's Proposed Project except notching of OCRD would occur during CY 6*. Impact Issues FI-1, (Access Route Improvements) and FI-10 (Relocate CAW Water Diversion Upstream), would be the same as Alternative 1. Impact Issues FI-9b (Impacts to Fish from Excavation or Dredging of Sediment for Fish Passage) and FI-12 (Downstream Fish Passage over SCD) would not apply to this alternative.*

Issue FI-2: Dewatering River Channels for Construction Purposes

Short-term loss of aquatic habitat
Determination: ***significant, unavoidable, short-term***

IMPACT

The plunge pool immediately downstream of SCD would be dewatered, to facilitate dam removal, in the same manner as in the Proponent's Proposed Project except that it would occur during CY 6.

MITIGATION

Mitigation actions are the same as the Proponent's Proposed Project FI-2 (Dewatering River Channels for Construction Purposes), except they would not include Tularcitos Creek and would occur in CY 6.

While it is difficult to determine whether the loss of fish that are not rescued or that are injured or die during the rescue and relocation operations is significant, the losses along

with the short-term loss of habitat for steelhead cannot be fully mitigated and would be significant.

Issue FI-4: Diversion of Carmel River and San Clemente Creek around San Clemente Reservoir for Construction Purposes

Short-term loss of aquatic habitat
Determination: ***significant, unavoidable, short-term***

IMPACTS

Impacts would be similar to those described for Alternative 1, except the stream channels would be out of production for three construction seasons. The length of stream diversions would be the same as for Alternative 1. This would be a significant, unavoidable impact because of the loss of seasonal rearing habitat.

Loss of habitat in the Carmel River would affect about 3,800 juvenile steelhead and about 1,100 juvenile steelhead from San Clemente Creek. This represents about 6.2 percent of the total steelhead in the river below LPD. This loss of production would occur for three construction seasons.

MITIGATION

Mitigation measures would be the same as Alternative 1, except they would occur for three years during the construction season.

While it is difficult to determine whether the loss of fish that are not rescued or that are injured or die during the rescue and relocation operations is significant, the losses along with the temporary loss of habitat for steelhead for 3 construction years cannot be fully mitigated and would be significant.

Issue FI-5: Reservoir Dewatering

Short-term loss of aquatic habitat
Determination: ***significant, unavoidable, short-term***

IMPACT

Impacts resulting from reservoir dewatering would occur in CY 4, 5, and 6 and would be similar to those described for Alternative 1 except that in CY 5, the reservoir would be excavated down to 480 to 500 feet in elevation and in CY 6, the sediment would be excavated down to the original bed of the river, around elevation 460 feet at the Dam. This would be a significant, unavoidable impact because of the loss of seasonal rearing habitat in the reservoir. At the end of the CY 5, the reservoir would hold about 1,000 AF of water before it would spill, potentially affecting habitat conditions downstream in the Carmel River and possibly delaying the downstream migration of juvenile steelhead until the Dam spills.

Impacts would be similar to those described for Alternative 1 FI-5 (Reservoir Dewatering), except the reservoir would be lowered by about 21 vertical feet to facilitate

sediment removal in CY 4. Lowering the water level to 504 feet would completely dewater the reservoir. The reservoir would be drawn down three times, once in CY 4, 5, and 6. This would be a significant, unavoidable impact due to the temporary loss of habitat for steelhead.

Operation of a 500 AF reservoir between the second and third construction seasons would be the same as Alternative 1.

Operation of a 1000 AF reservoir between the third and fourth construction seasons would affect the hydrology of the Carmel River in late fall/early winter (see Section 4.2) during refill. These hydrologic effects would occur again in the spring during the dewatering and would affect habitat in the lower river for steelhead. At the beginning of the wet season there would be about 1000 AF of potential storage in the reservoir that would need to fill before the Dam would spill. During late spring, the 1000 AF in storage would be released through the slide gate at 494-foot and 456-foot elevations, potentially affecting steelhead habitat conditions in the river downstream of the Dam.

Short-term impacts to fish in the reservoir would occur from draining the reservoir at the start of the second, third and fourth construction seasons. The reservoir would store up to 500 AF of water at the end CY 4 and would affect flows in the lower river from one day to eight weeks, depending on the water year, until the reservoir fills (ENTRIX 2000). Release of the 500 AF during the start of CY 5 would occur after the end of the steelhead migration season. The reservoir would store up to 1000 AF of water at the end of CY 5 and would affect flows in the lower river from one day to eight weeks, depending on the water year, until the reservoir refills (ENTRIX 2000). Release of the 1000 AF during the start of CY 6 would occur at a time after the end of the steelhead migration season.

Loss of reservoir rearing habitat is estimated to eliminate habitat for an unknown number of juvenile steelhead. This loss would occur for three construction years.

The direct effects to aquatic habitat during dewatering would be a significant, unavoidable impact to steelhead resources in San Clemente Reservoir resulting in a loss of rearing habitat in the reservoir during CY 4, 5, and 6. Short-term impacts would be greater than the Proponent's Proposed Project because the reservoir would be drained for three consecutive years.

MITIGATION

Mitigation measures would be the same as for the Proponent's Proposed Project Mitigation Measure FI-5 (Reservoir Dewatering), except that fish rescues would occur for three consecutive years. Mitigation for operation of a 500 AF and 1000 AF reservoir in CY 5 and CY 6 respectively would be provided by maintaining upstream passage through the fish ladder during the entire migration season.

While it is difficult to determine whether the loss of fish that are not rescued or that are injured or die during the rescue and relocation operations is significant, the losses along with the short-term loss of habitat for steelhead for three construction years cannot be fully mitigated and would be significant.

Issue FI-7 Fish Ladder Closure

Short-term limiting fish movement past the Dam site
Determination: ***less than significant, short-term***

IMPACT

See issue FI-7 under the Proponent's Proposed Project for a discussion of the issues and analysis of the impacts. Under Alternative 2, the fish ladder would be closed near or after the end of the migration season in CY 4, 5, and 6. This would be a less than significant, short-term impact.

Issue FI-8 Upstream Fish Passage

Long-term impact to fish migrating to upstream spawning and rearing habitat
Determination: ***beneficial, long-term***

IMPACT

Removal of the Dam and reservoir would eliminate the unnatural obstruction to migration at the Dam and reservoir site.

MITIGATION

This is a beneficial impact. No mitigation is required.

Issue FI-9a: Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream

Long-term loss of aquatic habitat
Determination: ***significant, unavoidable in the short-term, beneficial long-term***

Issue FI-9 as identified in the Draft EIR/EIS has been designated as FI-9a in the Final EIR/EIS to separate the analysis of downstream sediment impacts from sluicing, dredging, or sediment transport from the impacts to fish due to excavation or dredging in the remnant reservoir for fish passage (presented as Issue FI-9b).

IMPACT

Alternative 2 would remove the Dam and most of the sediment behind it. Fish in the river downstream of the Dam would be exposed to some sedimentation during the winter CY 4, 5, and 6, but most of the sediment would be retained within the newly excavated reservoir. Most potential sediment impacts would occur after dam removal is completed in the winter CY 6. Pre-dam sediment transport rates would be restored to the river downstream of the Dam site for the first time in over 80 years. At the end of the 41-year simulation, deposited sediment would increase bed elevation, sediment volume and gravel volume in all subeaches except 8.3 and 8.7. Additional gravel would improve

habitat for fish and aquatic invertebrates throughout the Carmel River from the Dam downstream through Subreach 7.7.

There would be an initial large volume of fine sediment released from the exposed former inundation area. Suspended sediment modeling indicated this alternative would attain an SEV of 8 in subreaches 4, 6, and 7 and attain an SEV of 9 in Subreach 5. An increase to an SEV of 9 would be a significant impact because it shifts the Effects Level from Sublethal Effects to Lethal and Paralethal Effects. Fishery Reach 5 makes up about 9 percent of the steelhead and 5.3 percent of the juvenile rearing habitat downstream of LPD.

Compared to the existing conditions with an SEV of 7 in all subreaches, Alternative 2 scores are higher for subreaches 4.3 to 7.3 with an SEV of 9 for Subreach 5 and an SEV of 8 for the other subreaches. Compared to the 2030 Baseline with an SEV of 8 in subreaches 6.3 through 9, Alternative 2 is the same for subreaches 6.3, 7.3 and 7.7 and is lower (SEV of 7 compared to 8) for the subreaches 8.3 though 9. Subreaches 4.3 and 4.7 for Alternative 2 have an SEV of 8 compared to 7 for the 2030 Baseline; Subreach 5 has an SEV of 9 compared to 7 for the 2030 Baseline.

Fishery Reaches 4 through 7 support about 49,200 juvenile steelhead representing about 60 percent of the total juvenile steelhead and about 42 percent of the rearing habitat in the river downstream of LPD.

MITIGATION

BMPs for erosion control (SWPPP, Appendix K) and revegetation (Botanical Resources Plan, Appendix U) would be implemented in the reservoir zone during CY 6 as the Dam is being demolished. BMPs are described in Appendix K for erosion and Appendix U for revegetation. The channels through the former reservoir site would be restored to a geomorphically correct form. Sediment transport would be restored to the Carmel River downstream of the former dam site. The mitigation measures would reduce the impacts. However, the overall impact would remain significant and unavoidable in the short-term. Restoring historic sediment transport rates through the reservoir would eventually improve habitat conditions in the lower Carmel River and would be beneficial in the long-term.

Issue FI-13: Stream Sediment Removal, Storage and Associated Restoration

Long-term reduction of aquatic habitat, short-term alteration of aquatic habitat
Determination: ***short-term, significant, unavoidable; long-term, beneficial***

IMPACT

Sediment excavation impacts would be similar to those described for Alternative 1, although a larger volume of sediment would be moved and impacts would occur CY 4, 5, and 6. This would cause a temporary loss of steelhead habitat in the reservoir area.

As mitigation, the dewatered Carmel River and San Clemente Creek would be restored during CY 6 as the Dam is removed as mitigation. This would be a significant impact.

MITIGATION

As part of Alternative 2, both the Carmel River and San Clemente Creek would be completely rebuilt with gravel, cobble and boulder materials salvaged during sediment removal. Channels would be restored to mimic their historic condition. The buried channels would be exhumed during the sediment removal process. Restoration of the channels would be based upon the uncovered topography and a geomorphic understanding of appropriate channel dimensions, considering substrate size, gradient, and valley width. The restored channel length would be similar to the channel lengths that existed prior to the construction of SCD. These activities would restore about 6,700 feet of Carmel River channel and about 2,200 feet of San Clemente Creek channel (Table 4.4-11). Riparian zones along the restored channels would be re-vegetated with native trees and shrubs. However, with mitigation, this would be a significant short-term impact but would be a long-term benefit.

Alternative 3 (Carmel River Reroute and Dam Removal)

Aquatics and fisheries impacts and mitigation for Issues FI-3 (Operation of a Trap and Truck Facility at ORCD), FI-6 (Water Quality Effects on Fish), FI-7 (Fish Ladder Closure), FI-11 (Fish Screen Installation), F-14 (Notching Old Carmel River Dam) and FI-15 (Sleepy Hollow Steelhead Rearing Facility), would be the same as the Proponent's Proposed Project. Impacts and mitigation for Issues FI-1 (Access Route Improvements) and Impact FI-10 (Relocate CAW Water Diversion Upstream) would be the same as Alternative 1 except that it would relocate the diversion upstream 2,900 feet. Impact Issues FI-2 (Dewatering River Channels for Construction Purposes) and FI-8 (Upstream Fish Passage), would be the same as Alternative 2 except FI-2 would occur during CY 4. Impact Issues FI-9b (Impacts to Fish from Excavation or Dredging of Sediment for Fish Passage) and FI-12 (Downstream fish passage over SCD) would not apply to this alternative.

Issue FI-4: Diversion of Carmel River and San Clemente Creek around San Clemente Reservoir for Construction Purposes

Short-term loss of aquatic habitat
Determination: ***significant, unavoidable, short-term***

IMPACT

Impacts would be similar to those described for Alternative 2 Issue FI-4 except the Carmel River would be diverted out of its channel for about 3,300 feet upstream of the Dam and about 1,350 feet for San Clemente Creek. Both stream channels would be out of production for two years. This would be a significant, unavoidable impact because of the loss of seasonal rearing habitat.

Loss of habitat would affect an unknown number of juvenile steelhead rearing in the reservoir. This loss of habitat would occur for three construction seasons and would be a significant impact.

MITIGATION

Mitigation for Issue FI-4 would be the same as Alternative 2 except it would occur for about 3,300 feet in the Carmel River for 1,350 feet of San Clemente Creek and would occur for two years during the construction season.

While it is difficult to determine whether the loss of fish that are not rescued or that are injured or die during the rescue and relocation operations is significant, the losses along with the short-term loss of habitat for steelhead for two construction year cannot be fully mitigated and would be significant.

Issue FI-5: Reservoir Dewatering

Short-term loss of aquatic habitat
Determination: ***significant, unavoidable, short-term***

IMPACT

Reservoir dewatering in CY 4 and 5 would be similar to the Proponent's Proposed Project Issue FI-5, except that the sediments would be dewatered to near the original elevation of the river bed of the river to allow for complete sediment removal in the San Clemente Creek arm of the reservoir and in the Carmel River immediately upstream of the Dam. Dewatering would occur for two construction seasons. This would be a significant, short-term impact.

MITIGATION

Mitigation measures would be the same as for the Proponent's Proposed Project Mitigation Measure FI-5, except they would occur for three construction years. Operating traps at the inflowing channels to the reservoir would mitigate downstream passage.

While it is difficult to determine whether the loss of fish that are not rescued or that are injured or die during the rescue and relocation operations is significant, the losses along with the short-term loss of habitat for steelhead for three construction years cannot be fully mitigated and would be significant.

Issue FI-9a: Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream

Long-term loss of aquatic habitat
Determination: short-term ***less than significant; beneficial, long-term***

IMPACT

Alternative 3 would remove the Dam and the sediment in the San Clemente Arm of the reservoir. Fish in the river downstream of the Dam would be exposed to some sedimentation during the winter following CY 4 and 5. Most potential sediment impacts would occur after storm flows following dam removal. Sediment transport rates would be restored to about 75 percent of the pre-dam levels in the river downstream of the dam site. At the end of the 41-year simulation, deposited sediment would increase bed elevation, sediment volume and gravel volume in all subeaches except subreaches 6.3, 8.3, and 8.7. This would improve habitat for fish and aquatic invertebrates throughout the Carmel River from the Dam downstream through Subreach 5, 7.3, and 7.7.

There would be some fine sediment released from the exposed former inundation area in the San Clemente arm of the reservoir. Suspended sediment modeling indicated this alternative would not change the effects levels from Sublethal in subeaches downstream of SCD. This would be a less than significant impact.

Compared to the existing conditions with a Sublethel Effects Level for suspended sediment concentrations in all subreaches, Alternative 3 would result in the same Sublethal Effects Levels for all subreaches downstream of SCD. Compared to the 2030 Baseline, Alternative 3 would result in the same Sublethtal Effects Levels in subreaches downstream of SCD.

Fishery Reaches 6 and 7 support about 33,943 juvenile steelhead representing about 43 percent of the total juvenile steelhead and about 26 percent of the rearing habitat in the river downstream of LPD. This would be a less than significant impact in the short-term and beneficial in the long-term. No mitigation is required.

Issue FI-13: Stream Sediment Removal, Storage, and Associated Restoration

Long-term reduction of aquatic habitat, short-term alteration of aquatic habitat
Determination: ***significant, unavoidable in the short-term; beneficial in the long-term***

IMPACT

Rock material from the diversion channel cut through the ridge separating the Carmel River from San Clemente Creek would be used to construct a cutoff wall across the Carmel River arm upstream of the diversion channel. Excess rock and concrete blocks from dam removal would be used to buttress the toe of the sediment storage area on the Carmel River arm. The Carmel River and San Clemente Creek would not support conditions for rearing steelhead during CY 4.

Accumulated sediment would be excavated from about 800 feet of the existing San Clemente Creek channel. About 3,600 feet of the present Carmel River channel upstream of the Dam would be permanently lost to sediment storage.

About 2,200 feet of San Clemente Creek would become the Carmel River including about 850 feet of channel now under the reservoir in the San Clemente arm. The Carmel River would change from about 3,000 feet to 2,650 feet, a reduction of about 350 feet. San Clemente Creek would lose 1,350 feet of channel from the reservoir upstream to the confluence with the realigned Carmel River channel. There would be a net loss of about 1,700 feet of channel (Table 4.4-11) – a combination of shortening the Carmel River and moving the confluence of the Carmel River and San Clemente Creek upstream about 2,200 feet. There would be temporary loss of habitat for steelhead and other aquatic species in the reservoir and both channels during construction. There would be a permanent loss of about 1,700 feet of channel length under this alternative (Table 4.4-11). This would be a long-term significant impact.

MITIGATION

A new channel for the Carmel River would be constructed through the diversion bypass channel between the Carmel River and San Clemente Creek, and down the San Clemente Creek arm. The new configuration would include about 300 feet of constructed channel through the bypass, and about 2,200 feet of newly constructed channel in the existing San Clemente Creek arm. Channel restoration activities would include excavation and placement of gravel, cobble, and boulder materials salvaged during sediment removal. Construction of the new Carmel River channel would be geomorphically designed based upon flow capacity requirements, gradient, and valley width of the Carmel River. Habitat in restored channels would be re-vegetated with native trees and shrubs.

The Dam would be removed, restoring unimpaired fish access past the SCD site to the upper watershed and substantially restoring sediment transport to the lower river. The loss of 1,700 feet of channel would significant, but the long-term improvement to habitat conditions in the restored channels and removal of the Dam as a fish barrier would be a benefit. Even though there is a long-term benefit, there are significant short-term impacts that cannot be mitigated.

4.4.3.3 Alternative 4 (No Project)

Aquatic and fisheries impacts and mitigation for Issues FI-1 (Access Route Improvements), FI-2 (Dewatering River Channels for Construction Purposes), FI-3 (Operation of a Trap and Truck Facility at the ORCD), FI-4 (Diversion of Carmel River and San Clemente Creek Around San Clemente Dam for Construction Purposes), FI-6 (Water Quality Effects on Fish), FI-7 (Fish Ladder Closure), FI-9a (Sediment Impacts to Downstream channels from Sluicing, Dredging or Sediment Transport Downstream), FI-9b (Impacts to Fish from Excavation or Dredging of Sediment for Fish Passage), FI-10 (Relocate CAW Water Diversion Upstream), FI-11 (Fish Screen Installation), FI-13 (Stream Sediment Removal, Storage and Associated Restoration) FI-14 (Notching Old Carmel River Dam) and FI-15 (Sleepy Hollow Steelhead Rearing Facility) would not apply to this alternative.

Issue FI-5: Reservoir Dewatering

Long-term loss of aquatic habitat
Determination: ***significant, unavoidable, long-term***

IMPACT

The Interim Seismic Safety Measures Annual Reservoir Drawdown required by DSOD would continue as an interim method to provide dam safety. Drawdown would occur on May 31 each year when flows are at or below 30 cfs at the Sleepy Hollow gage. The Annual Drawdown would continue to occur until the reservoir is filled with sediment or when there is less than 50 acre feet of storage remaining in the reservoir.

While it is difficult to determine whether the loss of fish that are not rescued or that are injured or die during the rescue and relocation operations is significant, the losses along with the short-term loss of habitat for steelhead each season cannot be fully mitigated and would be significant. This would be a significant long-term impact.

MITIGATION

No mitigation would be provided under the No Project Alternative. The Annual Drawdown is covered under a NMFS Biological Opinion and the CDFG Streambed Alteration Agreement both address operations from 2007 through 2012.

Issue FI-8: Upstream Fish Passage

Long-term impact to fish migrating to upstream spawning and rearing habitat
Determination: ***significant, unavoidable, long-term***

IMPACT

The existing ladder would remain in place and continue to provide impaired upstream passage to adult steelhead. No ladder improvements would occur and the SOMP would not be implemented. This would be a significant long-term impact.

MITIGATION

No mitigation would be provided under the No Project Alternative.

Issue FI-12: Downstream Fish Passage over SCD

Long-term impacts to adult fish passing over San Clemente Dam
Determination: ***significant, unavoidable, long-term***

IMPACT

The No Project Alternative would retain the Dam with no improvements and the SOMP would not be implemented. Adult fish would continue to be exposed to injury or death as they pass over the spillway and fall the 65 feet into the plunge pool. This would be a significant long-term impact.

MITIGATION

No mitigation would be provided under the No Project Alternative.

Issue FI-15: Sleepy Hollow Steelhead Rearing Facility

Loss or degradation of water supply
Determination: ***significant, unavoidable, long-term***

IMPACT

The SHSRF depends on Carmel River water from SCD to operate from early summer to winter or early spring. The No Project would result in the reservoir filling with sediment, blocking the intake for water and degrading reservoir and downstream water quality. This would be a significant long-term impact.

MITIGATION

No mitigation would be provided under the No Project Alternative.

4.5 VEGETATION AND WILDLIFE

This section describes the potential impacts of the San Clemente Seismic Safety Project on the terrestrial biological resources of the Project Area. Vegetation and wildlife resources include all vegetation and wildlife influenced by the project, except for fisheries, which is covered in Section 4.4. Wetlands are covered in Section 4.6. Additional information provided in this Final EIR/EIS) clarifies and amplifies the information included in the Draft EIR/EIS. The following environmental setting section was prepared using information developed from the documents provided by the RDEIR (Denise Duffy & Associates 2000), which was initiated in 1997. Additional data were acquired during studies in 2005 for alternatives not considered in the RDEIR, or for modifications to previously considered alternatives. Appendix T contains the botanical report for the sediment disposal options. Appendices U and V contain the Botanical Resources Management Plan and Protection Measures for Special-Status Species.

4.5.1 ENVIRONMENTAL SETTING

Vegetation Communities

Based on literature review and field surveys, fifteen plant communities (habitat types) dominated primarily by native species were identified in the Project Vicinity. Six of these communities are riparian, four communities are upland forest or woodland types, and three communities are upland shrub-dominated types. The remaining two native plant communities are herbaceous. A number of sites within the Project Vicinity were mapped as intermediate between two recognized community types. Generally, these communities correspond to Sawyer and Keeler-Wolf's vegetation series (Sawyer & Keeler-Wolf 1995). Mixed stands may be described by Holland's vegetation classifications (Holland 1986), and these classifications have also been provided where they correlate with the series categories.

In addition to the native plant communities, sites that are classified as developed or disturbed/ruderal occur in the Project Area. On these sites, human activity controls the vegetation present.

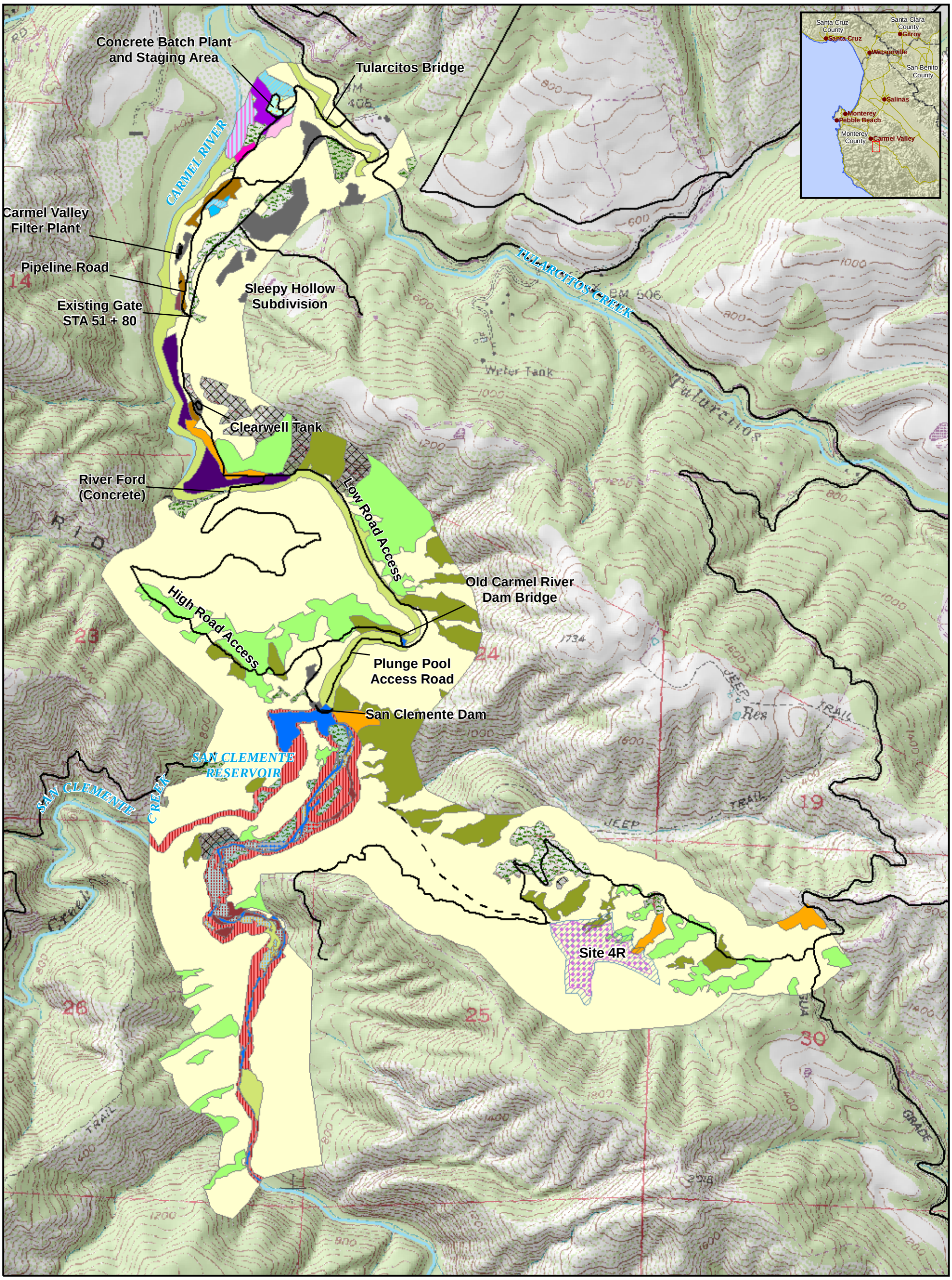
Brief descriptions of the vegetation types occurring within the Project Area are presented below. The distributions of the habitat types within the Project Area are shown in Figure 4.5-1. A list of vascular plant species observed in the Project Area is presented in Appendix T.

Riparian Vegetation

CENTRAL COAST COTTONWOOD-SYCAMORE RIPARIAN FOREST

This community is the predominant riparian type on the flood plains of the Carmel River and Tularcitos Creek. The dominant species are large trees, including black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), California sycamore (*Platanus racemosa*), red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), and white alder (*Alnus rhombifolia*).

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Legend

- Stream
- Existing Road
- Proposed Road
- Sediment Disposal Site
- Alternative 1 (16 Acres)
- Alternative 2 (22 Acres)

Vegetation

- Annual grassland
- Arroyo willow series
- Bulrush-cattail series
- Blue oak series
- Black sage series
- Coast live oak series
- California sagebrush series
- California sagebrush-black sage series
- Chamise series
- Chamise-black sage series
- Developed
- Emergent wetland
- Mock heather scrub
- Mulefat-willow riparian
- Mulefat series
- Narrowleaf willow series
- Ruderal
- Sandbar
- Water
- Sandbar annuals
- Central Coast cottonwood-sycamore riparian forest
- White alder riparian
- White alder-willow riparian
- Willow riparian
- California sycamore riparian-arroyo willow
- California sycamore riparian-coast live oak
- California sycamore riparian-mock heather scrub
- California sycamore savanna
- California sycamore series

San Clemente Dam EIS/EIR

Figure 4.5-1

Vegetation/Habitat Types in the Study Area

0 0.15 0.3 0.6 Miles

N

Projection: California State Plane, Zone IV
Datum: NAD 83 Units: Feet

D:\GIS\entrix\3018605\map\SC_Vegetation_17i11i_03.mxd 7/5/2007 1:12:13 PM Mukhtyar

Coast live oak (*Quercus agrifolia*), California buckeye (*Aesculus californica*), and California bay (*Umbellularia californica*) are also found in this riparian forest. Characteristic shrub species in areas of infrequent flooding include common snowberry (*Symphoricarpos albus* var. *laevigatus*), poison-oak (*Toxicodendron diversilobium*), and red-osier dogwood (*Cornus sericea*). Vines such as Pacific blackberry (*Rubus ursinus*) and virgin's bower (*Clematis ligusticifolia*) also may be abundant locally. The herb layer is generally sparse, but herb species such as slough sedge (*Carex barbarae*), stinging nettle (*Urtica dioica* ssp. *holosericea*), and Douglas' mugwort (*Artemisia douglasiana*) occur locally in the understory.

WHITE ALDER RIPARIAN FOREST

In areas within and adjacent to the Carmel River and San Clemente Creek channels that are subject to more frequent or more intense flooding, the tree canopy is sparser and less developed. Trees, primarily white alder and red willow, are interspersed with large shrubs such as narrow-leaved willow (*Salix exigua*), mule fat (*Baccharis salicifolia*), shrubby arroyo willow, and redosier dogwood (*Cornus sericea*). Shrubs and small trees may form dense thickets. A wide variety of herb species occurs in the more open areas. Stands of this community that occupy the edge of the previous high-water line of the reservoir around the reservoir pool have died since the maximum elevation of the reservoir has been lowered by the permanent removal of the flashboards.

ARROYO WILLOW SERIES (CENTRAL COAST ARROYO WILLOW RIPARIAN FOREST)

This community is dominated by the shrub arroyo willow, with red willow an associated species. The arroyo willow series occurs in two places in the northern portion of the Project Vicinity. The canopy of the arroyo willow forest is typically dense, with few understory plants. In the Project Vicinity, a few other shrubs such as coyote brush (*Baccharis pilularis*), poison-oak and vines such as Pacific blackberry may be present. The relatively sparse herbaceous understory includes Douglas' mugwort, California bee-plant (*Scrophularia californica*), and stinging nettle. The relatively large stand of the arroyo willow series near the northern end of the Project Vicinity consists of a dense willow canopy interspersed with open areas dominated by a dense, often impenetrable, cover of coyote brush.

CALIFORNIA SYCAMORE SERIES (SYCAMORE ALLUVIAL WOODLAND)

Only one stand of this community occurs in the Project Vicinity. It is located on the Carmel River floodplain, just south of the mouth of Tularcitos Creek. This community is savanna-like riparian woodland with widely spaced trees and a relatively dense, grass-dominated herbaceous understory. California sycamore is the dominant tree, with valley oak (*Quercus lobata*) and coast live oak as associated species. Many of the trees are quite large. The vegetation in understory and open areas between the trees is dominated by grasses and herbs, including ripgut brome (*Bromus diandrus*), long-

beaked filaree (*Erodium botrys*) and valley lessingia (*Lessingia glandulifera* var. *pectinata*).

NARROWLEAF WILLOW SERIES (CENTRAL COAST RIPARIAN SCRUB)

This community occurs in one segment of the Carmel River channel, south of the mouth of Tularcitos Creek. This series is dominated by large shrubs, particularly narrow-leaved willow. Associated shrub species include shrubby arroyo willow, mule fat, poison-oak, and Spanish broom (*Spartium junceum*). Saplings and small trees of California sycamore, black cottonwood, and white alder are also frequent, but large trees are few and widely scattered. In areas where shrub cover is sparse or absent, a wide variety of herb species occur, including common horsetail (*Equisetum arvense*), horseweed (*Conyza canadensis*), western goldenrod (*Euthamia occidentalis*), Mexican tea (*Chenopodium ambrosioides*), and Durango root (*Datisca glomerata*).

MULEFAT SERIES (MULEFAT SCRUB)

This community occurs in scattered patches in the Carmel River floodplain, upstream of the Dam. It is found on the sandbars, and intergrades with the willow-dominated series. This series is dominated by mulefat (*Baccharis salicifolius = B. vimenea*). Herbaceous understory is sparse to non-existent. Associated species include young plants of arroyo willow, sandbar willow, and occasionally, white alder.

Upland Forest and Woodland Vegetation

COAST LIVE OAK SERIES (COAST LIVE OAK FOREST)

In the Project Vicinity, this community is the most widespread type on relatively moist slopes with moderately deep soils, particularly on slopes west of the Carmel River. The tree canopy is typically dense, generally exceeding 80 percent (Ecosystems West 1997). Coast live oak is the dominant tree species. Associated tree species in more diverse stands include California bay, California buckeye, madrone (*Arbutus menziesii*), and valley oak. Due to the dense canopy, the understory shrub layer of the coast live oak forest is typically poorly developed. Shrubs and woody vines frequently occurring locally in the understory include creeping snowberry (*Symphoricarpos mollis*), poison-oak, and Pacific blackberry. Herb cover also is generally sparse to moderate, but includes wood fern (*Dryopteris arguta*), yerba buena (*Satureja douglasii*), and western rye grass (*Elymus glaucus*).

CALIFORNIA BAY SERIES (CALIFORNIA BAY FOREST)

One small stand of this community occurs in the Project Vicinity, located on the lowermost slope on the west side of the reservoir's main arm. This is a dense, closed-canopy forest habitat. California bay is the dominant tree species, with madrone a common associate.

BLUE OAK SERIES (BLUE OAK WOODLAND)

In the Project Vicinity, there is one small stand of this community on the north side of Osborne Ridge north of San Clemente Reservoir, along the existing "high road." This community forms an open, savanna-like tree canopy dominated by blue oak (*Quercus douglasii*). In the Osborne Ridge stand, coast live oak is associated with blue oak, with tree cover around 50 percent (Ecosystems West 1997). Few shrubs occur in this stand. The grass and herb layer is well-developed and relatively dense. Dominant or characteristic grasses and herbs include ripgut brome, soft chess (*Bromus hordeaceus*), western rye grass, tarplant (*Madia* sp.), and shooting star (*Dodecatheon* sp.).

REDWOOD SERIES (UPLAND REDWOOD FOREST)

A very small stand of coast redwood (*Sequoia sempervirens*) is located just below the SCD on the west side, along the canyon bottom. The understory of this stand mostly consists of poison-oak. This small stand, the only occurrence of coast redwood in the Project Area, is at the inland limit for coast redwood in the project region.

Upland Shrub Vegetation

COASTAL SCRUB (CENTRAL LUCIAN COASTAL SCRUB)

In the Project Vicinity, coastal scrub is widespread on the slopes bordering the Carmel River canyon, and is most widespread east of the Carmel River in the southern portion of the area. Coastal scrub typically occupies slopes that are drier than those occupied by coast live oak forest, although not as dry as those occupied by chaparral. The coastal scrub in this area is characterized by a dense and often impenetrable shrub layer. Coastal scrub is typically variable in its dominant shrubs, but two species, California sagebrush (*Artemisia californica*) and black sage (*Salvia mellifera*), are the most widespread dominant shrubs in this community in the Project Vicinity. The herb layer is poorly developed or absent except where more open patches exist. Grass and herb species associated with this habitat type include small-flowered needlegrass (*Nassella lepida*), California cudweed (*Gnaphalium californicum*), prickly cryptantha (*Cryptantha muricata* var. *jonesii*), and the vine pipestem clematis (*Clematis lasiantha*). Three intergrading subtypes of coastal scrub occur in this area, and are described below.

California Sagebrush Series. California sagebrush is the dominant shrub in this series. Associated shrub species include coyote brush, black sage, sticky monkeyflower (*Mimulus aurantiacus*), poison-oak, chamise (*Adenostoma fasciculatum*), California buckwheat (*Eriogonum fasciculatum*), and deerweed (*Lotus scoparius*). In the Project Vicinity, the California sagebrush series is found on dry, rocky, east- and south-facing slopes. It is sometimes associated with road cuts or similar disturbances. In this area, it is more limited in extent than black sage-dominated coastal scrub and typically occurs on lower, more sheltered slopes (Ecosystems West 1997).

Black Sage Series. Stands of the black sage series are usually overwhelmingly dominated by black sage. Associated species include California sagebrush, coyote brush, sticky monkeyflower, poison oak, chamise, and California buckwheat. Small and medium-sized coast live oaks are frequent in this community in the Project Vicinity. The herb layer in this phase of coastal scrub is typically even sparser and less diverse than in the California sagebrush series. In the Project Vicinity, this series tends to occur on more exposed east- and south-facing slopes (Ecosystems West 1997).

California Sagebrush-Black Sage Series. The California sagebrush-black sage series is intermediate between the California sagebrush and black sage series. California sagebrush and black sage are equally dominant in this series. Other shrub species include coyote brush, sticky monkeyflower, poison-oak, California buckwheat, chamise, and deerweed. The shrub composition of this subtype tends to be more diverse than in either of the other two subtypes of coastal scrub. The herb layer, where present, is similar to that in the California sagebrush series. In the Project Vicinity, this series occurs on lower west- and south-facing slopes (Ecosystems West 1997).

CHAPARRAL (CHAMISE CHAPARRAL)

This community occurs on the driest, most exposed slopes in the Project Area, typically forming a dense, often impenetrable scrub that is three to ten feet in height. Herbs are generally sparse or absent except in localized openings. Two intergrading subtypes of chaparral occur in the Project Area, and are described below.

Chamise Series. Chamise is the major dominant species in this subtype, and often forms pure stands. Other shrub species sometimes found in this series include black sage, jimbrush (*Ceanothus oliganthus* var. *sorediatus*), California buckwheat, and poison oak. Chamise chaparral is widespread on exposed south- and west-facing slopes in the southern half of the Project Vicinity (Ecosystems West 1997).

Chamise-black sage series. This series is intermediate between the chamise series and the black sage subtype of the coastal scrub communities. Black sage and chamise share dominance in this series. Other shrub species commonly found in this community include California buckwheat, jimbrush, and California sagebrush. In the Project Vicinity, the chamise-black sage series is commonly found on south-facing slopes in the southern half of the Project Vicinity. This series is frequently found growing adjacent to road cuts and similar disturbances (Ecosystems West 1997).

MOCK-HEATHER SCRUB

This scrub type is developed locally on the floodplain of the Carmel River just south of the mouth of Tularcitos Creek in the northern portion of the Project Vicinity. In the area occupied by mock-heather shrub, the alluvial substrate consists primarily of fine sand. The mock-heather scrub is a moderately dense scrub type dominated by mock-heather (*Ericameria ericoides*), a species that is restricted to sandy soils. Coyote brush is the most common shrub associate. Small amounts of poison-oak and scattered small coast

live oaks also occur in this habitat type. The herb layer is sparse, but includes Douglas's mugwort and creeping wildrye (*Leymus triticoides*). Rattail fescue (*Vulpia myuros*) is locally abundant (Ecosystems West 1997).

Herbaceous Vegetation

CALIFORNIA ANNUAL GRASSLAND SERIES (NON-NATIVE GRASSLAND)

Annual grassland communities occur on a number of localized sites throughout the Project Vicinity, including the Carmel River floodplain as well as in the uplands. These grasslands are generally dominated by non-native annual grasses and native and non-native herbs, including ripgut brome, soft chess, slender wild oat (*Avena barbata*), long-beaked filaree, and valley lessingia. Some stands of this community have been subject to obvious disturbances such as brush clearing and grading, and intergrade with the disturbed/ruderal habitat type in the Project Vicinity.

BULRUSH-CATTAIL SERIES (COASTAL AND VALLEY FRESHWATER MARSH)

There are two retention ponds in the Project Vicinity north of the existing water treatment facility. These retention ponds are seasonally flooded. During the period in which the surveys were conducted for the 2000 RDEIR, one of the retention ponds was flooded and created a freshwater marsh or pond habitat referable to the bulrush-cattail series. Viscid bulrush (*Scirpus acutus* var. *occidentalis*) and broad-leaved cattail (*Typha latifolia*) dominated this artificially created marsh habitat (Ecosystems West 1997).

DEVELOPED/DISTURBED/RUDERAL HABITAT TYPES

These habitat types encompass a variety of sites with vegetation that is primarily the result of human activity and disturbance, and include sites that are occupied by buildings and other developed facilities and associated landscaped areas. They also include sites that have been subject to relatively recent, often repeated, heavy disturbance such as grading, excavating, or brush clearing. The species of vegetation in these habitats vary greatly, depending on micro-habitat conditions and disturbance and planting history. These sites are typically dominated by an assortment of weedy, mostly non-native annual and perennial grasses and herbs, unless they are occupied by developed facilities or landscaping. Some native species can also persist in or colonize ruderal sites. Any of these sites may have considerable bare ground.

Vegetation Communities Traversed by Access Routes

The access routes traverse a series of vegetation communities, as described below:

THE TULARCITOS ACCESS ROUTE

The Tularcitos Access Route for the Proponent's Proposed Project begins at the Carmel Valley Road and joins the dam access road. It begins in coast live oak woodland and passes through Central Coast cottonwood-sycamore riparian forest, coast live oak woodland, arroyo willow series, mock heather scrub, California sycamore riparian-mock heather scrub, annual grassland, coast live oak woodland, California sycamore riparian-

coast live oak, annual grassland, coast live oak woodland, ruderal vegetation, coast live oak woodland, ruderal habitat, coast live oak woodland, and annual grassland.

THE CACHAGUA ACCESS ROUTE

The Cachagua Access Route (Alternatives 1, 2, and 3) consists of the Jeep Trail from Cachagua Road to the sediment disposal site. It begins in coast live oak woodland, and passes through chamise series, chamise-black sage series, coast live oak woodland, chamise series, coast live oak woodland, annual grassland, coast live oak woodland, annual grassland, chamise-black sage series, and ends in coast live oak woodland.

The conveyor route, which is part of the access route for Alternatives 1, 2, and 3, begins at the Jeep Trail at Site 4R and ends at the reservoir. Although it passes primarily through coast live oak woodland, two short sections intercept or partly intercept chamise-black sage series. This route ultimately ends in white alder-willow riparian vegetation at the reservoir, but this last is considered part of the construction area, not part of the access route.

SAN CLEMENTE DRIVE

San Clemente Drive begins at the Carmel Valley Road and continues through the Sleepy Hollow community up to the intersection with the Tularcitos Access Route. The road through Sleepy Hollow begins in coast live oak woodland, passes through Central Coast cottonwood-sycamore riparian forest and back into coast live oak woodland, then through annual grassland, coast live oak woodland, annual grassland, coast live oak woodland, annual grassland, coast live oak woodland, annual grassland, and meets the Tularcitos route in coast live oak woodland/annual grassland. The Proponent's Proposed Project would only use this section until the Tularcitos Access Route is completed. The other action alternatives would use it for access to the base of the Dam.

San Clemente Drive and its various subsidiary roads extend from the Tularcitos road junction to the Dam and back for all project alternatives. The main road passes through coast live oak woodland, ruderal and developed habitat, coast live oak woodland, chamise-black sage series, chamise series, chamise-black sage series, partially intercepts an area of California sycamore series, passes through more chamise-black sage series and a more extensive area of California sycamore series, between chamise-black sage series and Central Coast cottonwood-sycamore riparian forest, then through coast live oak woodland, Central Coast cottonwood-sycamore riparian forest, chamise-black sage series, coast live oak woodland. At the OCRD, the eastern access route extends southwest through Central Coast cottonwood-sycamore riparian forest to the foot of the Dam. The western access route crosses the Carmel River via the bridge and passes through chamise-black sage series, chamise series, and coast live oak woodland, and several small developed areas associated with the Dam facilities. Another unnamed road extends over the hill from the dam facility back to the main access road, crossing the Carmel River at the ford. This road begins in coast live oak woodland near the Dam and passes through chamise-black sage series, coast live

oak woodland, chamise series, a combination of chamise-black sage series and coast live oak woodland, coast live oak woodland, chamise series, a long stretch of coast live oak woodland, an area with blue oak series, another long stretch of coast live oak woodland, annual grassland, more coast live oak woodland, Central Coast cottonwood-sycamore riparian forest, and joins the main road in California sycamore series vegetation.

Wildlife

Valley and Foothill Riparian (Central Coast cottonwood-sycamore riparian forest, white alder riparian forest, arroyo willow series, California sycamore series, narrowleaf willow series, mulefat series): Valley-foothill riparian habitats provide food, water, migration and dispersal corridors, and escape, nesting, and thermal cover for an abundance of wildlife. At least 50 amphibians and reptiles occur in lowland riparian systems. Many are permanent residents; others are transient or temporal visitors. Typical species include western pond turtle (*Emys* [*Clemmys] marmorata*), garter snakes, swallows, vireos, flycatchers, bats, and raccoon (*Procyon lotor*).

Montane Hardwood (California Bay series): Bird and animal species characteristic of the Montane Hardwood habitat include scrub jay (*Aphelocoma californica*), Steller's jay (*Cyanocitta stelleri*), acorn woodpecker (*Melanerpes formicivorus*), western gray squirrel (*Sciurus griseus*), wild turkey (*Meleagris gallopavo*), mountain quail (*Oreortyx pictus*), band-tailed pigeon (*Columba fasciata*), California ground squirrel (*Spermophilus beecheyi*), dusky-footed woodrat (*Neotoma fuscipes*), black bear (*Ursus americanus*), and mule deer (*Odocoileus hemionus*) (Mayer & Laudenslayer 1988). Deer also use the foliage of several hardwoods to a moderate extent. Many amphibians and reptiles are found on the forest floor in this habitat. Among them are ensatina (*Ensatina eschscholtzii*) and western fence lizard (*Sceloporus occidentalis*), rubber boa (*Charina bottae*), western rattlesnake (*Crotalus viridis*), California mountain kingsnake (*Lampropeltis zonata*), and sharp tailed snake (*Contia tenuis*).

Blue oak woodland (blue oak series): This plant community provides breeding habitats for a large variety of species. For example, in the western Sierra Nevada, 29 species of amphibians and reptiles, 79 species of birds, and 22 species of mammals utilize this habitat for breeding (Mayer & Laudenslayer 1988). Wildlife species characteristic of oak habitats include western fence lizard, western rattlesnake, western scrub jay, acorn woodpecker, Botta's pocket gopher (*Thomomys bottae*), and California ground squirrel.

Coastal Oak Woodland (coast live oak series): Coastal oak woodlands provide habitat for a variety of wildlife species. At least 60 species of mammals are reported to use oaks in some way. As many as 110 species of birds have been observed during the breeding season in California habitats where oaks form an important part of the canopy or subcanopy. Quail, turkeys, squirrels, and deer may be so dependent on acorns in fall and early winter that a poor acorn year can result in substantial declines in their

populations (Mayer & Laudenslayer 1988). Species commonly found in this habitat are similar to those in blue oak woodland.

Coastal Scrub (California sagebrush series, black sage series, California sagebrush-black sage series, mock-heather scrub): Though vegetation productivity is lower in Coastal Scrub than in adjacent chaparral habitats associated with it, Coastal Scrub appears to support numbers of vertebrate species roughly equivalent to those in surrounding habitats (Mayer & Laudenslayer 1988). Species typical of this habitat are similar to those described below for chamise-redshank chaparral.

Chamise-Redshank Chaparral (chamise series, chamise-black sage series): A wide variety of wildlife use chaparral habitat. Wildlife that commonly may be found in this habitat type includes common kingsnake (*Lampropeltis getula*), California quail (*Callipepla californica*), Bewick's wren (*Thryomanes bewickii*), Anna's hummingbird (*Calypte anna*), greater roadrunner (*Geococcyx californianus*), black-tailed jackrabbit (*Lepus californicus*), and coyote (*Canis latrans*).

Annual grassland (California annual grassland series): Common wildlife species typical of this habitat include western fence lizard, western rattlesnake, turkey vulture (*Cathartes aura*), American kestrel (*Falco sparverius*), California ground squirrel, Botta's pocket gopher, western harvest mouse (*Reithrodontomys megalotis*), California vole (*Microtus californicus*), black-tailed jackrabbit, and coyote.

Fresh emergent wetlands (bulrush-cattail series): These habitats are among the most productive wildlife habitats in California and are important to wildlife for water and food. Common wildlife species in this habitat include Pacific chorus frog (*Pseudacris regilla*), western aquatic garter snake (*Thamnophis couchii*), great egret (*Ardea alba*), great blue heron (*Ardea herodias*), Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), red-winged blackbird (*Agelaius phoeniceus*), ornate shrew (*Sorex ornatus*), deer mouse, and muskrat (*Ondatra zibethicus*).

Riverine habitat in the Project Area is found along the Carmel River and its tributaries. Riverine habitat can provide resting and escape cover for waterfowl. Several gulls and terns forage in open water. Near-shore waters provide food for waterfowl, herons, shorebirds, and belted kingfisher (*Ceryle alcyon*). Many species of insectivores (e.g., swallows, swifts, and flycatchers) forage over the water.

Lacustrine habitat in the Project Area is supplied by the reservoir. This habitat is used by 18 mammal, 101 bird, nine reptile, and 22 amphibian species. Open water habitat provides resting and foraging habitat for several waterbirds, including the American coot (*Fulica americana*), common merganser (*Mergus merganser*), and great blue heron. Other characteristic species found in open water habitats include the eared grebe (*Podiceps nigricollis*), pied-billed grebe (*Podilymbus podiceps*), common goldeneye (*Bucephala clangula*), cliff swallow (*Petrochelidon pyrrhonota*), tree-swallow

(*Tachycineta bicolor*), and several bat species (Mayer and Laudenslayer 1988). Open water also provides a water source for many common mammal species.

In addition, several species of wildlife have adapted to developed habitat. These include rock dove (*Columba livia*), western scrub jay, northern mockingbird (*Mimus ployglottos*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), opossum (*Didelphis marsupialis*), raccoon, and striped skunk (*Mephitis mephitis*).

Sensitive Habitats

Sensitive habitats include riparian corridors, wetlands, habitats for legally protected species and CDFG species of special concern, areas of high biological diversity, areas providing important wildlife habitat, and unusual or regionally restricted habitat types. Habitat types considered sensitive in this analysis were based on those listed on the California Natural Diversity Database's (CNDDB) working list of "high priority" habitats (i.e., those habitats that are rare or endangered within the borders of California). In September, 2000, critical habitat was proposed in the Federal Register for the California red-legged frog (CRLF). The proposed designation was revised November 3, 2005 and includes 51 habitat units, including Monterey County. A final designation is still under consideration. On September 2, 2005, the final designation of critical habitat for steelhead was listed in the Federal Register. The designation includes Monterey County. Habitat types dominated by oaks (*Quercus* spp.) are also considered sensitive under the provisions of Title 16, Chapter 16.60, Monterey County Code, which provides for preservation of oaks and other protected tree species.

In addition, ten of the fifteen native plant communities occurring in the Project Area are recognized as sensitive habitats. Eight of these communities are recognized as "high priority" habitats by the CNDDB, as follows: the central coast cottonwood-sycamore riparian forest, the arroyo willow series (central coast arroyo willow riparian forest), the California sycamore series (sycamore alluvial woodland), the narrow-leaf willow series (central coast riparian scrub), the white alder riparian forest, the California bay series (California bay forest), mulefat scrub, and the bulrush-cattail series (coastal and valley freshwater marsh). The two remaining sensitive habitats are the coast live oak series (coast live oak forest) and the blue oak series (blue oak woodland), which are considered sensitive habitats under the provisions of Title 16, Chapter 16.60, Monterey County Code. A brief description of these sensitive habitats on the Project Site is provided below. The distribution and extent of the sensitive habitats in the Project Vicinity is shown in Figure 4.5-1.

Riparian Habitats

Riparian habitats are sensitive because they are ecologically specialized habitats of limited distribution, have high value for wildlife, and have declined greatly in California due to large-scale disturbances such as urbanization, stream channelization, and agricultural conversion (Warner and Hendrix 1984).

CENTRAL COAST COTTONWOOD-SYCAMORE RIPARIAN FOREST

This is a CNDDB "high priority" habitat type that is found along the Carmel River in the Project Vicinity (including the narrowleaf willow series, which intergrades with the central coast cottonwood-sycamore riparian forest. This forest is a diverse, well-developed, high-quality, native riparian complex. The hydrology of this riparian habitat is artificially controlled by the upstream dams, but the riparian habitat has experienced little direct human disturbance. It is composed almost entirely of native species, with little invasion of non-natives, except for localized colonies of Spanish broom. The biological diversity of the riparian forest and scrub habitat in the Project Vicinity makes it especially valuable to wildlife by providing a variety of microhabitats.

The riparian forest is more limited in extent along Tularcitos Creek than along the Carmel River. This forest is similar to the cottonwood-sycamore riparian forest along the Carmel River, but is more uniformly a dense closed-canopy forest, reflecting the much lower frequency and intensity of flooding along Tularcitos Creek (Ecosystems West 1997).

ARROYO WILLOW SERIES (CENTRAL COAST ARROYO WILLOW RIPARIAN FOREST)

This is a CNDDB "high priority" habitat type that is of high value for wildlife. This habitat has been greatly reduced in regional extent by the same large-scale disturbances as other riparian types. This habitat type occurs in two locations in the northern portion of the Project Vicinity. It lies within the floodplain of the Carmel River, but is away from the main channel.

CALIFORNIA SYCAMORE SERIES (SYCAMORE ALLUVIAL WOODLAND)

This is a CNDDB "high priority" habitat type. This habitat type is sensitive because it is limited in extent and because it has been reduced by the same large-scale disturbances as other riparian types. The only example of this habitat type in the Project Vicinity is on the east bank of the Carmel River, south of the mouth of Tularcitos Creek.

NARROWLEAF WILLOW SERIES (CENTRAL COAST RIPARIAN SCRUB)

This is a CNDDB "high priority" habitat type. This habitat occurs in and immediately adjacent to the Carmel River channel in the northern portion of the Project Vicinity, forming part of the complex of riparian habitats along the Carmel River. The heterogeneity of the riparian habitats along the river increases their importance as sensitive habitats. Like other riparian habitat types, the narrowleaf willow series is considered a sensitive habitat type because of its high value for wildlife and because it has been reduced by large-scale disturbances to riparian corridors.

COAST LIVE OAK SERIES (COAST LIVE OAK FOREST)

Coast live oak forest is widespread on upland slopes throughout the Project Vicinity. This habitat type is considered sensitive under the provisions of Title 16, Chapter 16.60,

Monterey County Code and is subject to Section 21083.4 of the California Public Resources Code (2004), relating to oak woodlands conservation. The CDFG has also been directed by the state legislature under State Senate Concurrent Resolution No. 17 (California Resolution Chapter 100) to conserve oak woodlands where CDFG has direct permit or licensing authority. Oaks are important to wildlife for shelter and food (acorns). In addition, they are of general public interest and high scenic value. Oak forests and woodlands are also considered sensitive due to the considerable recent loss of oak-dominated habitats state-wide and the decline in regeneration of many oak species.

BLUE OAK SERIES (BLUE OAK WOODLAND)

This oak-dominated habitat type is also considered sensitive under the provisions of Title 16, Chapter 16.60, Monterey County Code and is subject to Section 21083.4 of the California Public Resources Code (2004), relating to oak woodlands conservation. Blue oak woodland is a widespread habitat type in the dry interior of Northern and Central California. The Project Vicinity is relatively close to the coast for this habitat type, and only one small stand occurs within the Project Vicinity, on the north side of Osborne Ridge north of SCD.

CALIFORNIA BAY SERIES (CALIFORNIA BAY FOREST)

This is a CNDDB "high priority" habitat type. The only stand of this habitat type in the Project Vicinity occurs on the lower slope adjacent to the eastern shore of San Clemente Reservoir.

BULRUSH-CATTAIL SERIES (COASTAL AND VALLEY FRESHWATER MARSH)

This is a CNDDB "high priority" habitat type. Freshwater marshes are sensitive habitats because they are limited in extent, are highly dependent on specialized ecological conditions, have high value for wildlife, and are easily degraded by disturbances such as alteration of hydrology. The only stand of this habitat type in the Project Vicinity is artificial in origin, occurring in Settling Pond Number 1 northeast of the Filter Plant. It is, however, ecologically similar to a naturally occurring freshwater marsh.

Special-status Species

Special-status species include plant and wildlife species listed by the USFWS as Threatened or Endangered under provisions of the Federal ESA of 1973 United States Code (16 USC 1531 et. seq., as amended) as well as Proposed and Candidate species for listing (USFWS 2007). Critical habitat for federally listed special-status species may also be designated. Special-status species also include wildlife species listed as threatened or endangered by the CDFG under provisions of the 1984 California Endangered Species Act (CESA) (CDFG 2005a, 2005b), and plant species listed as Rare, Threatened, or endangered by CDFG under provisions of CESA and the 1977 Native Plant Protection Act (NPPA) (CDFG 2005a). Wildlife species listed by CDFG as species of special concern (CDFG 2005b) are also special-status species.

Special-status species also include plant species included on List 1A (Plants Presumed Extinct in California), List 1B (plants rare, threatened, or endangered in California and elsewhere), or List 2 (plants rare, threatened, or endangered in California, but more common elsewhere) of the California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants of California (CNPS 2001). These species are subject to State regulatory authority under CEQA. Plant species included on Lists 3 and 4 of the CNPS Inventory could be also considered special-status species. These species are considered to be of lower sensitivity. They generally do not fall under specific State or federal regulatory authority, and specific mitigation considerations are generally not required for these species.

Special-status Plant Species

The potential special-status plant species that may occur in the Project Vicinity were determined based on a review of literature and special-status species data bases, including previous botanical surveys conducted for the Proponent's Proposed Project elsewhere in the vicinity of the project, and on previous knowledge of the regional flora by the biological consultant's botanists. This list is presented in Appendix T. Surveys for special-status species were conducted in 1997 and 2005, and were scheduled to coincide with the periods during which all potential special-status species would be identifiable.

Only two special-status plant species, virgate eriastrum (*Eriastrum virgatum*) and Lewis's clarkia (*Clarkia lewisii*) were found in the Project Vicinity. One small population of virgate eriastrum (an annual species), consisting of 20 to 30 plants in 1997, was found to occur in the Project Vicinity. This population is located at the eastern edge of the floodplain of the Carmel River in the northern portion of the Project Vicinity (Ecosystems West 1997). The plants were found in an old roadbed consisting of sandy alluvium in an open area separating a central coast cottonwood-sycamore riparian forest from coast live oak forest. This species flowers from May to July and is found in sandy chaparral and coastal dune habitats (CNPS 2001) at elevations below 500 meters (Hickman 1993). Virgate eriastrum is on List 4 of the CNPS Inventory, and does not fall under specific state or federal regulatory authority.

Lewis's clarkia was found along the Jeep Trail that is a proposed access route for Alternatives 1, 2, and 3, as well as the proposed sediment disposal site for Alternatives 1 and 2, and the diversion dike area for Alternative 3. This species is also a CNPS List 4 taxon. Lewis's clarkia is an annual species that typically flowers from May to July (CNPS 2001). This plant is usually found in chaparral, cismontane woodland, or coastal scrub communities at elevations below 300 meters (Hickman 1993).

Special-status Wildlife Species

Special-status wildlife species documented as occurring in the study area include: the federally listed CRLF, western pond turtle, foothill yellow-legged frog, two striped garter snake, Monterey dusky-footed wood rat, Cooper's hawk, osprey, and yellow warbler. A

nonbreeding single willow flycatcher was reported in May 1997 in riparian habitat considered suboptimal for the species, but no other federal or state listed threatened or endangered bird species were found in the Project Area.

Potentially suitable habitat for other special-status species also exists in or near the Project Area, including: the federally listed California tiger salamander, Coast Range newt, coast horned lizard, Townsend's big-eared bat, California mastiff bat, pallid bat, double-crested cormorant, sharp-shinned hawk, bald eagle, golden eagle, and yellow-breasted chat. No Smith's blue butterflies, suitable habitat or preferred host plants were detected during the surveys. Each special-status wildlife species known or with potential to occur in the study area is discussed below, including a discussion of the quality of habitat and likelihood of occurrence for those species with potential to occur.

AMPHIBIANS AND REPTILES

California red-legged frog (CRLF) (Rana draytonii).[1] The CRLF is listed as threatened under the Federal Endangered Species Act, and is a California species of special concern (Jennings and Hayes 1994; CDFG 2005a). CRLFs spawn in marshes, springs, natural and artificial ponds, slack water pools of rivers and streams (Jennings and Hayes 1994; Hayes and Jennings 1988, Stebbins 2003), and tidally influenced freshwater marshes (Smith and Reis 1996). Typical spawning pool habitat includes moderately deep water (to 1.25 meter in depth), dense bordering and emergent vegetation (e.g., tules, (*Scirpus*), cattails (*Typha*), sedges and rushes (*Carex* and *Juncus*), and willows (*Salix*)), mud or silt substratum, nearly full to full sun exposure, and abundant forage for adults and tadpoles including benthic and suspended algae, benthic macroinvertebrates, and small terrestrial vertebrates such as tree frogs and mice (Jennings and Hayes 1994). CRLF tadpoles are typically found within dense aquatic vegetation, where they are cryptic and also readily find forage (Weins 1970). Hayes and Jennings (1988) noted that tadpoles also forage or hide in muddy substrata. Ranid tadpoles, presumably including CRLF tadpoles, generally consume benthic and suspended algae. CRLFs can use seasonal ponds for spawning, so long as water persists through August (Hayes and Jennings 1988; S. Barry, pers. obs.).

Adult CRLFs may remain nearly all year along the margins of suitable spawning habitat, but during the summer in many regions adult frogs may move from sunlit spawning pools to well-shaded streams with bank undercuts and exposed root masses, so-called “summer habitat” (USFWS 2002). Stream corridors are often considered to be potential “dispersal habitat” for this species (USFWS 2002), but these frogs may use virtually any vegetated non-saline habitat to move among spawning and summer sites (S. Barry, pers. obs.). These frogs typically enter hibernation sites beginning in late October and emerge by mid-January or somewhat later depending on region (USFWS 2002).

[1] Most earlier references use the scientific name *Rana aurora draytonii* for the California red-legged frog, but as of August 2004 this frog is regarded as a full species known as *Rana draytonii* (Shaffer et al. 2004)

CRLFs have declined in the southern part of the state due to habitat loss (Jennings and Hayes 1994). The reasons for declines elsewhere are less clear. The recovery plan for this subspecies (USFWS 2002) states that "Habitat loss and alteration are the primary factors that have affected the CRLF negatively throughout its range." Exotic aquatic predators (bullfrogs, crayfish, and fish), habitat degradation from agricultural and grazing practices, and decreased water quality due to human manipulation of habitats and from water diversion all have been suggested as factors that may explain the decline of this species. However, the effects of these factors are not well documented. Although predation and competition by bullfrogs (*Rana catesbeiana)* is frequently postulated to explain declining CRLF populations, bullfrog control or eradication programs have not always proven effective. Bullfrogs and CRLFs co-occur in seemingly stable relative numbers at many ponds in coastal California (Barry 1999; USFWS 2002). The recovery plan for the CRLF (USFWS 2002, p. 24) states that introduced bullfrogs, crayfish, and species of fish have been a significant factor in the decline of the CRLF. The plan acknowledges that "Changes in habitat that are unfavorable to CRLFs tend to be favorable to a suite of introduced non-native aquatic predators, making it difficult to identify detrimental effects of specific introduced species on CRLFs."

The USFWS has indicated that proliferation of bullfrog populations along the central California coast (e.g. Monterey County) is a substantial threat to the persistence of the CRLF in this area. Insufficient data are available to conclusively determine the extent or mechanism of potential negative impacts of bullfrog populations on coastal CRLF populations in Monterey County or specifically in the Carmel River watershed. However, both species share habitat along the Carmel River and the evidence presented by Hayes and Jennings (1988) suggests that the coexistence is over 100 years old. It is not known whether populations of either species are relatively stable or variable within the watershed under baseline conditions, and monitoring would be needed to determine population trends if habitat conditions change. The current San Clemente drawdown monitoring and rescue program is not designed to identify causal factors responsible for changes in frog populations.

Surveys during the annual drawdowns pursuant to the Interim Seismic Safety Measures for SCD found CRLFs and bullfrogs co-occurring throughout San Clemente Reservoir. Predation has been documented; CRLFs have been found in the stomachs of bullfrogs collected in the Project Area, although other reports indicate that crayfish are a primary food source for bullfrogs. Since 2003, numbers for both species have fluctuated and shifted among locations, possibly as a result of management activities. Bullfrogs consistently outnumber CRLFs at the reservoir pool where specific habitat conditions favor that species. CRLFs are doing well upstream and downstream; and bullfrogs are less numerous than native species downstream.

Upstream of the reservoir pool, USFWS and CAW have collaboratively devised an enhancement program for CRLF. The program involves extensive bullfrog eradication in riparian stream and small pool settings. Enhancement sites have been monitored and improved, and bullfrog eradication has been implemented at these sites.

Implementation of the program since 2003 appears to have benefited CRLF recruitment and overall numbers are benefiting markedly (Froke 2004, 2005, 2007). In and around management sites, CRLF numbers have benefited by releases and natural recruitment has taken place; simultaneously bullfrog numbers have been diminished. Furthermore, downstream of the reservoir, from the Dam to Highway 1, CAW is in the seventh year of intensively monitoring and managing for CRLF reproduction; management that includes rescue and relocation of hundreds of tadpoles each summer (i.e., from stranding conditions), and capture and sacrifice of every bullfrog encountered. The monitoring program is designed to detect and ultimately predict environmental stress to natal populations caused by changes to water level and temperature.

Dispersal of individual CRLFs plays an important role in metapopulation dynamics and therefore, the persistence of populations. SCD was built within a steep, confined reach of the river valley. Although dispersal of individual CRLFs in the Project Area has not been rigorously studied, the SCD may pose a barrier to dispersal.

Site Occurrence. CRLFs had been found frequently during previous surveys in suitable riparian habitat within and near the project site. CRLF “rescues” have been carried out annually since 2003 as part of the mitigation program for the annual drawdown for Interim Seismic Safety Measures for SCD. These operations have resulted in the capture and relocation of hundreds of adults, juveniles, and tadpoles from the reservoir headwaters and isolated pools in the sediment beds along both reservoir arms to more secure pools upstream (as well as the culling of hundreds of bullfrogs) (Froke 2005, 2007).

CRLFs also occur upstream and downstream of the project site on the Carmel River. Numerous observations of CRLFs have been made, documenting a wide distribution of the species throughout the Carmel River Basin (these are cited in the 2000 RDEIR by Denise Duffy & Associates as MPWMD, EIR Associates (Dr. David Mullen), Dr. Jeffery Froke, Zander and Associates, and ENTRIX). The plunge pool and spill-influenced downstream channel below SCD is believed to be unsuitable for this species (none were found during the 1997 surveys) but the species is well-documented further downstream in the Carmel Valley (Museum of Vertebrate Zoology 2005).

These surveys and rescues indicate that CRLFs are nearly ubiquitous wherever bordering cover and low gradient slope is contiguous with the waterway within San Clemente Reservoir and the Carmel River arm upstream of the reservoir, at least to the upstream edge of the deposited sediment bed. Surveys by ENTRIX in July 2005 confirmed that pond habitat within the Carmel River arm occurs up to the upstream end of the reservoir sediment bed, but spawning pools outside of the main river channel are absent further upstream within the surveyed reach, which extended upstream of the sediment bed. Systematic annual surveys conducted between 2002 and 2006 have documented CRLF reproduction in side-channel and off-channel pools up to 1.5 miles upstream of San Clemente Reservoir. As the reservoir levels decline during the summer (and during the annual reservoir drawdown), frogs and tadpoles tend to concentrate in

some of the isolated pools in the sediment bed, particularly in densely vegetated areas. The sediment bed is clearly the most important habitat feature of the reservoir during that period.

These frogs also occur, but somewhat less widely, in the San Clemente Creek arm of the reservoir and upstream into the creek. During 1997 surveys, three adult red-legged frogs (including at least one male) were observed by EcoSystems West at the upper extreme of the San Clemente Reservoir along the creek. Surveys further upstream along both the San Clemente Creek and Carmel River arms of the reservoir yielded no additional red-legged frog observations in 1997. However, ten CRLFs were observed (nine captured) in San Clemente Creek in 2004 (Froke 2004), and five CRLFs were observed (five captured) in 2005 (Froke 2005). ENTRIX biologists recorded one probable sighting in July 2005 along San Clemente Creek approximately one mile upstream of San Clemente reservoir, and found that much of San Clemente creek upstream of the reservoir is potentially suitable summer habitat. This area is probably suitable spawning habitat only in the slack water reach just upstream of the reservoir. No CRLF tadpoles were observed in San Clemente Creek in 2004 and 2005, but tadpole, juvenile, and adult bullfrogs were observed and removed in 2004, 2005 and 2006 (Froke 2005 and 2007).

Approximately 1.5 kilometers of the lower portion of Tularcitos Creek was surveyed during 1997, and no CRLFs were observed in this area. In 2000, an adult CRLF was observed in Tularcitos Creek downstream of San Clemente Drive.

Foothill yellow-legged frog (Rana boylii). The foothill yellow-legged frog is a California species of special concern. Low-gradient rocky creeks and streams with dappled shade bordered by mixed chaparral or deciduous and evergreen woodlands constitute the primary habitat for this frog (Zweifel 1955).

Site Occurrence. This species has been documented previously from the Carmel River (California Academy of Sciences 2005) and from San Clemente Creek (Museum of Vertebrate Zoology 2005). No frogs of this species were found during earlier surveys for this project, but an ENTRIX biologist observed one specimen along San Clemente Creek within one mile of SCD in July 2005. The available habitat along this reach of San Clemente Creek is considered marginal for this species, but the stream habitat along this reach may be the best available along San Clemente Creek because of its relatively low gradient relative to upstream reaches. Bullfrogs were abundant along San Clemente Creek during these surveys, but they seemed to favor pool habitat and to avoid the long shallow riffle/runs favored by foothill yellow-legged frogs.

California tiger salamander (Ambystoma californiense). The California tiger salamander (*Ambystoma californiense*) is listed as threatened under the Federal ESA and is a California species of special concern. The California tiger salamander is a terrestrial species that spawns for a few days in water but spends the rest of the year aestivating in subterranean habitat, using the burrows of California ground squirrel

(*Spermophilus beecheyi*) and valley (Botta) pocket gopher (*Thomomys bottae*) (Storer 1925, Stebbins 2003). These salamanders emerge with the first fall rains and move at night to pools when they have impounded enough water to support spawning (Stebbins 1951, Barry and Shaffer 1994). Spawning habitat includes rain pools and ditches and other still water such as stock ponds, small lakes, and (rarely) vernal pools (Barry and Shaffer 1994). After a spawning period that may last as little as a day or two, the adult salamanders leave the spawning pool and return to aestivation habitat. They may re-emerge and revisit spawning pools if late-season rains occur (Stebbins 1951).

Site Specific Occurrence. Although potentially suitable aquatic spawning habitat for the California tiger salamander occurs near the Project Area, this species has not been recorded during field surveys conducted there. California tiger salamanders are well documented from the Carmel Valley, especially the vicinity immediately adjacent to the Hastings Reservation upstream of San Clemente reservoir where life history and demographic variation in the species have been studied since the early 1990's through the year 2000 (Barry and Shaffer 1994, Trenham et al. 2000). Potentially suitable spawning habitat occurs in the Project Vicinity along the Carmel River in the form of two seasonal ponds downstream of the CVFP. No specialized techniques designed to detect California tiger salamanders adults or larvae in terrestrial or aquatic habitat (e.g., seining, drift-fence/live trap) were conducted during 1997 surveys.

Coast Range newt (Taricha torosa torosa). The Coast Range (western or California) newt is a California Species of Concern where it occurs from Monterey County south (CDFG 2005b). This status was originally only from south of the Salinas River in Monterey County (Jennings & Hayes 1994), but has been extended to cover the species throughout Monterey County. Adults are found in terrestrial habitats, but they breed in slow-moving streams, ponds, and reservoirs.

Site Occurrence. Numerous records for the Coast Range newt exist from the Carmel Valley (Museum of Vertebrate Zoology 2005). No Coast Range newts were observed in the Project Area during the surveys, but suitable habitat occurs along the Carmel River and San Clemente Creek.

Western pond turtle (Actinemys [=Clemmys] marmorata). The western pond turtle is a California species of special concern. It occurs in small lakes, ponds, creeks, rivers, and streams across most of the state, except in the Sierra Nevada above about 5000 feet in elevation and in the desert regions. The western pond turtle is most commonly associated with permanent or nearly permanent water within a wide variety of habitat types. Areas of dense turtle populations are typically associated with logs or large rocks used for basking. Pond turtles also require terrestrial habitats for egg laying sites and winter hibernation (Holland 1994).

Site Occurrence. In conjunction with CRLF surveys, observations of pond turtles were recorded and mapped. Western pond turtles were frequently observed along the Carmel River downstream from SCD. Observations of pond turtles were made 11 times with at

least six individuals present. Employees of CAW and MPWMD observed groups of 10 or more western pond turtles on the river (Denise Duffy & Associates 2000*).* Many basking sites exist along the river and reservoir, and potential habitat for nest building and hibernation is available on the site.

Coast horned lizard (Phrynosoma coronatum). The coast horned lizard originally included two subspecies (both classified as species of special concern by Jennings and Hayes (1994) but most authors (e.g., Stebbins 2003) no longer recognize these as valid subspecies. The entire species within California is now considered a species of special concern. The California horned lizard occurs primarily in open grassland or chaparral (sometimes in forested areas) with large sunlit areas for basking.

Site Occurrence. Numerous records for the coast horned lizard exist from the Carmel Valley and especially from the coastal dunes of Monterey County (California Academy of Sciences 2005, Museum of Vertebrate Zoology 2005). No coast horned lizards were observed in the Project Vicinity during the surveys, but suitable habitat seemingly occurs along the roads that parallel the Carmel River and along the Carmel River downstream from the CVFP.

California legless lizard (Anniella pulchra). The California legless lizard is a California species of special concern. It occupies sand dune and streamside habitat throughout coastal California as far north as Watsonville, Monterey County, but it is spottily distributed and occurs only where soil and forage conditions are suitable (Miller 1943). The presence of bush lupine often indicates that habitat conditions are suitable for legless lizards (Stebbins 2003).

Site Occurrence. California legless lizards are abundant in Monterey County. The black form of this distinctive lizard (formerly *Anniella pulchra nigra*, no longer taxonomically recognized) is well known from the Monterey Peninsula and the coastal dunes north to Watsonville, but does not appear to range inland into the Salinas, Pajarro, or Carmel River basins (Jennings and Hayes 1994). The “silvery” form (formerly *Anniella pulchra pulchra*) is known from several sites along the Salinas River in Monterey County but is not currently known from the Carmel Valley. The absence of sandy dune or loamy streamside habitat along the Carmel River may preclude its occurrence in the valley. No California legless lizards were observed during the surveys for this project, but specialized techniques for finding them, such as raking through plant litter under bush lupine, were not employed.

Two-striped garter snake (Thamnophis hammondii). The two-striped garter snake is a California species of special concern. This distinctive snake is so-named because it possesses a lateral stripe on each side of the body but is lacking the distinct mid-dorsal stripe that many other garter snake species possess (Rossman et al. 1996). It occupies the margins of sunlit rocky streams and feeds primarily on small fish (Stebbins 2003), and can be distinguished from other garter snake species that occur in the same region

by its absence of red lateral coloration and mid-dorsal stripe (Stebbins 2003; S. Barry, pers. obs.).

Site Occurrence. Jennings and Hayes (1994) indicate that the two-striped garter snake still occurred along much of the Carmel River (in 1994), which is near the northern limit of the species' range. Two-striped garter snakes were observed in the Carmel River arm of San Clemente Reservoir during the 2003 and 2005 drawdowns, and much of San Clemente Creek and the Carmel River above San Clemente Reservoir appears to offer suitable habitat and forage for this species.

Birds

Bald eagle (Haliaeetus leucocephalus). The bald eagle is a California Endangered Species. Formerly listed as threatened under the ESA, the species was publicly announced as delisted on June 28, 2007. Bald eagles require relatively large bodies of water containing standing populations of suitable-sized fish, and waterfowl supplement their diet. Nests, typically in large conifers in relatively secluded locations, are usually located within one mile of key foraging areas. Bald eagles are resident in California. They begin nesting (incubating) in late February through March, and young fledge by July. The California bald eagle breeding population now exceeds 115 breeding pairs, primarily concentrated in the north. Many more bald eagles visit California as winter migrants.

Site occurrence. No bald eagles were found during visual surveys in the Project Area. San Clemente Reservoir may not be large enough to provide breeding habitat for bald eagles; however, eagles may use several smaller reservoirs or river reaches within their territory, often covering distances exceeding 10 miles. Therefore, San Clemente Reservoir is potential foraging habitat and low suitability breeding habitat for bald eagles. The nearest known bald eagle nest occurs on the Nacimiento River in southern Monterey County (K. Sorenson, Ventana Wilderness Sanctuary, unpub. Report cited in Denise Duffy & Associates 2000). Bald eagles are more likely to utilize San Clemente Reservoir as winter migrants.

Golden eagle (Aquila chrysaetos). The golden eagle is a California species of special concern. These large birds nest on high (>30 ft.), vertical cliffs and in trees. They hunt mostly mammals over open habitats such as savanna or desert scrub, usually in mountainous or canyon country. Industrial, agricultural, and residential development is increasing in golden eagle foraging and nesting habitat, and the status and trends of the California golden eagle populations is currently tracked.

Site occurrence. The Carmel River canyon in the vicinity of the Project Area is predominately woodland or chaparral-type habitat and, therefore, contains only marginal habitat for golden eagles, which prefer to hunt in open grasslands or oak savanna. Golden eagles may nest in woodland areas if open areas are located nearby for foraging; potential nesting substrate does occur in the Project Area. The nearest reported golden eagle nest was found in Canada Canyon in 1991 (BioSystems Analysis

1991). Abundant foraging habitat occurs elsewhere on the hills surrounding Carmel Valley.

Cooper's hawk (Accipiter cooperi). The Cooper's hawk is a California species of special concern. Cooper's hawk nesting habitats include riparian deciduous, live oak, or second-growth conifers, usually near stream courses in dense stands with relatively high crown closure and open understory. Accipiters partition food on the basis of size and prey type: Cooper's hawks prey on equal proportions of medium-sized birds and small mammals. Although the Cooper's hawk once commonly nested throughout California, loss of riparian woodlands by logging and stream modification has resulted in a steep decline of nesting birds (Small 1994). Egg laying typically occurs in late April or early May, and young fledge in July.

Site occurrence. Suitable breeding and foraging habitat occurs in the Project Area in oak and riparian woodlands. One active Cooper's hawk nest was observed near the Carmel River, just north of the CVFP adjacent to Settling Pond Number 1. The nest was located approximately 15 meters southeast of the pond near the forest edge in a 20 meters tall live oak. It was active and contained two young in 1997. This nest was again observed in July of 1998 and was found to be active with two to three young birds near the nest. No other Cooper's hawk nests were found in the Project Area.

Osprey (Pandion haliaetus). The osprey is a California species of special concern. Osprey require relatively large bodies of water containing standing populations of suitable-sized fish. For nesting, they utilize snags or snag-top conifers, and tolerate a greater human presence near their nests than do bald eagles. Osprey nesting populations are concentrated in the northern coastal and mountain regions of California. The coastal breeding range of osprey extended north of San Francisco Bay in the 1980's, and was reportedly expanding at that time (Henny and Anthony 1989).

Site occurrence. A single osprey was observed hunting in the open water of San Clemente Reservoir in May 1997. The osprey also carried a stick into a live oak tree, but no nest was found. No other subsequent observations were made of osprey in the Project Area. San Clemente Reservoir may be a portion of the foraging range for osprey breeding at some unknown location in the area and should be considered suitable foraging habitat and potential nesting habitat.

Yellow warbler (Dendroica petechia brewsten). The yellow warbler is a California species of special concern. A common to uncommon summer resident, yellow warblers breed in a variety of habitats, but primarily occur in riparian deciduous woodlands and shrub habitats. They have experienced sharp declines in lowland portions of the state, largely due to loss of riparian habitat and from nest parasitism by brown-headed cowbirds.

Site occurrence. Evidence of yellow warbler breeding activity was found at two sites in the Project Area: 1) near the CVFP, in deciduous trees surrounding Settling Pond

Number 1 and 2) in riparian trees along the Carmel River downstream of the proposed batch plant location. Yellow warblers were detected singing during both May and July site visits and assumed nesting, although no actual nests were seen. No other yellow warblers were found in the Project Area, although suitable habitat occurred in riparian habitats along the Carmel River upstream of the CVFP.

Double-crested cormorant (Phalacrocorax auritus). The double-crested cormorant is a California species of special concern. This species is found along the coast and at larger freshwater lakes and reservoirs, rivers, and marshes; it nests on offshore islands, and inland on the margins of lakes, sloughs, and large rivers. Nests are located on cliffs and tall trees or snags. Double-crested cormorants no longer breed in the Sacramento or San Joaquin Valleys, and they have declined along the central and southern California coast. Their decline is attributed to habitat loss and human disturbance of nesting sites, especially by boats.

Site occurrence. Because of its small size, San Clemente Reservoir is probably marginal nesting habitat for double-crested cormorants. The reservoir may provide foraging habitat for wintering cormorants.

Sharp-shinned hawk (Accipiter striatus). The sharp-shinned hawk is a California species of special concern. Sharp-shinned hawks nest in a variety of habitats including deciduous riparian forest but are more commonly associated with dense stands of smaller conifers. They often hunt near openings, using adjacent woodland for cover. The sharp-shinned hawk formerly bred only in small numbers in California. Although their breeding population appears to be greatly reduced, data are lacking or old (Remsen 1978). Larger numbers of migrant sharp-shinned hawks winter in the state.

Site occurrence. Sharp-shinned hawks were formerly a common summer resident in adjacent Santa Cruz County, and there are historical nesting records along the river bottom of the Carmel River (Grinnell and Miller 1944). There is suitable nesting habitat for sharp-shinned hawks in the Project Area; however, they are more likely to be present as winter migrants.

Yellow-breasted chat (Icteria virens). The yellow-breasted chat is a California species of special concern. Yellow-breasted chats use riparian thickets and other brushy habitats near water when breeding. They have experienced sharp declines throughout much of California, largely due to loss of riparian habitat and nest parasitism by brown-headed cowbirds.

Site occurrence. No yellow-breasted chats were detected during field surveys but suitable breeding thickets occur along the Carmel River downstream of the CVFP.

Other Species

Smith's blue butterfly (Euphilotes enoptes smithi). Smith's blue butterfly is federally listed as endangered. This species typically occurs in coastal locations but can also

occur on inland sites. Two species of buckwheat, dune buckwheat *(Eriogonum parvifolium)* and seaside buckwheat *(E. latifolium),* are the preferred host plants for this butterfly.

Site occurrence. Dr. Richard Arnold conducted a survey of the study area for Smith's blue butterfly in June 1997. On the date of the survey, Smith's blue butterflies were observed and found to be active at previously known locations in Sand City and in western Carmel Valley. The survey was also timed to coincide with the flowering period of dune buckwheat and seaside buckwheat. No Smith's blue butterflies were observed during the project site survey. Neither host buckwheat occurs within the study area. Two related butterfly species, Acmor blue *(Plebejus acmon)* and Tilden's blue *(Euphilotes enoptes tildeni,* were observed in the study area. Based on the lack of preferred host plants in the study area, and the presence of related species that generally do not occur with Smith's blue butterfly, it is unlikely that Smith's blue butterfly occurs in the study area.

Monterey dusky-footed wood rat (Neotoma fuscipes luciana). This subspecies of the dusky-footed wood rat is a California species of special concern. It is common to abundant in deciduous and evergreen woodland habitats that provide dense overstory and understory cover. It can also be commonly found in chaparral, coastal scrub, and riparian habitats. Wood rats build houses of sticks, bark, leaves, and other forest debris at the base of, or within the canopy of a shrub, tree, or other structure.

Site Occurrence. A single Monterey dusky-footed wood rat nest was observed (Ecosystems West 1997) along the lower portion of Tularcitos Creek. The nest appeared to be recently occupied, with fresh plant material placed in the nest. A second nest was observed above the unpaved portion of Center Court Drive near Settling Pond Number 2. Suitable habitat is available for wood rats throughout the project site, including woodland, chaparral, and riparian habitats.

Townsend's big-eared bat (Plecotus townsendii townsendii). The Townsend's big-eared bat is a California species of special concern. It is widely distributed throughout California; its habitats include coastal forests and woodlands. Big-eared bats primarily use caves, but are also known to use mines, tunnels, barns, attics, and abandoned buildings that mimic cave environments. This species is most common in moist habitats.

Site Occurrence. Appropriate roosting sites do not occur on the project site. However, there are structures on the project site that might become suitable if abandoned and left standing. The valve house atop SCD is believed to harbor a day roost of at least one unidentified bat species.

California mastiff bat (Eumops perotis californicus). The California mastiff bat is a California species of special concern. This large bat is uncommon in much of California. The mastiff bat occurs in semiarid to arid habitats including deciduous and evergreen forest, coastal scrub, chaparral, grasslands, and urban areas.

Site Occurrence. This species may roost with other bat species, and according to CNDDB records for elsewhere in California it commonly roosts in anthropogenic structures such as houses and out buildings. Among two areas where roosting bats were identified during 1997, none of the individuals was a mastiff bat. The valve house atop SCD is believed to harbor a day roost of at least one unidentified bat species.

Pallid bat (Antrozous pallidus). The pallid bat is a California species of special concern. Pallid bats are very widely distributed across the lower elevations of California. The pallid bat occurs in habitats ranging from mixed conifer forest to arid desert regions. Rock outcrops and large hollow trees, for roosting appear to be an important part of the habitat structure.

Site Specific Occurrence. Appropriate roosting locations on the project site occur adjacent to the existing low road and potentially in anthropogenic structures within and near the Project Area, possibly including the valve house atop SCD. The rocky surface upslope of the road is the most appropriate place for pallid bats to roost on the site and bats may be present in this area. However, this species was not observed among two areas where other roosting bats were identified.

2030 Baseline Conditions

If current conditions at San Clemente Reservoir persist through 2030, San Clemente Reservoir, San Clemente Creek, and the Carmel River would continue to change through this period. San Clemente Reservoir would fill with sediment within 6 to 10 years and annual drawdowns would cease at that time (see Sections 4.2 Hydrology and Water Resources and 4.4 Fisheries). The reservoir would eventually become a floodplain stabilized by riparian vegetation. The riparian growth that is currently inhibited by the annual drawdown would stabilize and shift boundaries only as flood events periodically alter the floodplain. Increasingly dense riparian growth would probably increase the population densities of special-status riparian bird species including Cooper's hawk, yellow warbler, and yellow-breasted chat. However, complete sedimentation of the reservoir would render the site uninhabitable for open-water birds such as double-crested cormorant, bald eagle, and osprey. If current anthropogenic structures in the vicinity of SCD remain intact and unaltered through 2030, the local bat population, potentially including special-status bat species, would probably remain unchanged, although age-related anthropogenic structure changes might affect bat colony size and roost function. If current conditions remain through 2030, the local population of Monterey dusky footed wood rats seems unlikely to change because floodplain stabilization within the reservoir would affect wood rat habitat minimally. The greatest changes that would result from stabilization of current conditions through 2030 would be to amphibian and reptile populations. The floodplain would probably incorporate overflow pools and backwaters that would tend to favor CRLF population growth and bullfrog population would decline. Western pond turtles would also benefit from floodplain stabilization because the stream courses of the Carmel River and San Clemente Creek would remain wide and deep enough to offer sufficient forage and

cover. Flood events would scour the streams periodically and renew vegetation-growing surfaces, which would foster forage development. Habitat for the two-striped garter snake would increase over the current availability in the reservoir, but foothill yellow-legged frog rocky stream habitat availability would probably not change.

Should existing conditions persist through 2030, the plunge pool downstream of SCD would probably decline substantially in diameter and depth and become a naturally leveed channel stabilized by new riparian growth. Such a channel might offer improved potential spawning or summer habitat for CRLFs, but only if summertime flows decline sufficiently to preclude scouring. Habitat availability downstream for all of the other special-status species discussed in this section would probably remain unchanged downstream of the Dam.

In the San Clemente Reservoir sediment plain (Reach 3) gentle incision of the meandering channel into the coarse sands would probably allow for the development of young riparian communities. This is already being observed on the San Clemente sediment plain since the gates have been permanently lowered since 1995. Much of the San Clemente arm and the much larger Carmel River arm of the sediment plain already have fairly extensive areas of localized riparian scrub, very young riparian forest, willow clumps and islands, sedge meadow, isolated seasonal and perennial ponds, and fringe growth of alders and emergent riparian wetland vegetation. Larger floods, like the 1998 flood, would continue to scour large portions of the young riparian growth. Therefore the sediment plain is likely to remain patchy and dynamic. However, as increasingly coarse sediment and large woody debris are deposited on the terraces and help to stabilize them and as channel patterns develop into more incised meanders (less braided) an increased number of large patches of more mature riparian woodland and forest habitat would develop (Denise Duffy & Associates 2000).

Reach 4 (downstream of the SCD) has hard banks and the upper portion of Reach 5 has relatively hard banks and moderate gradients that would experience sediment accumulation on bars, benches, and low overflow channels. Based on the observed deposition of sediment in these areas from the 1982, 1986, 1995 and 1996 flood years, the effect of finer substrate deposition should be positive. These lower fluvial landforms are supporting different but relatively even-aged stands of riparian vegetation. These vary from little complexes of cottonwood-sycamore-willow-alder on the older deposits, to even-aged stands of alder and willow, to young herbaceous growth on the youngest bars. Even-aged alders and river sedge were observed lining the banks at localized bank failures, which could be dated to major 1982 flood years. Locations where the coarse sand and sediment was not deposited were often cobbly and relatively devoid of cover. Large episodic floods and deposits of sand could scour, bury, and kill recently established riparian and brushy habitats near water. These habitats may support riparian birds like the yellow warbler and yellow breasted chat. Since these reaches are hard and have a steeper gradient, they are less subject to bank failure and loss of mature riparian vegetation, even in smaller episodic events (Denise Duffy and Associates 2000)

Softer banks occur in the lower portion of Reach 5 in the Robles del Rio area and increasingly downstream through reaches 6 and 7 and the upper portion of Reach 8. In areas with softer banks, the river channel would become wider and shallower. Deposition and low flow channel migration would be likely to smother or remove young herbaceous and riparian scrub communities on the less stable bars, benches and terraces. Localized losses of older, higher riparian woodland and forest habitat could occur where historically incised soft banks are subject to channel widening and bank loss, especially the outside bends of sandy soil terraces with discontinuous riparian cover and root stabilization (Denise Duffy & Associates 2000).

Extensive areas of bare sandy flood plain and braided channels would be created when episodic events deposit large to very large amounts of material especially if they occur early in the project life. This could be particularly adverse if the widening occurs in places where there are only remnant riparian woodland/forest strips that would be totally lost (such as the lower and middle portions of Reach 6). However, less destructive, smaller and later-occurring episodic events could result in the development of extensive bars, benches, overflow channels, and low terraces that could become wooded during long periods of normal flows. As this riparian woodland and forest becomes more established and develops strong root systems, future episodic events would have less destructive effect. A complex depositional and erosion pattern with blowouts, terrace scour holes, and trapping of large woody debris could lead to a complex of riparian and wetland habitats of different ages. Increased habitat complexity and diversity could support an associated variety of riparian reptiles, amphibians, and birds (Denise Duffy & Associates 2000).

Reach 8 (especially the lower two thirds) and the upper portion of Reach 9 have finer grained alluvial soils, with more extensive riparian forest and root stabilized banks. These conditions are combined in numerous locations with hardened banks and a relatively straight and narrow river channel with good conveyance. Therefore, there would be less likely to be significant bank migration and loss of riparian vegetation in this reach. Substantial filling of the active channel would bury or create habitat favorable for growth of a succession of complex of riparian habitats. Minor changes that do occur are more likely to be due to localized conditions (which are relatively short lived) as sediment transport through this reach is relatively efficient. The major sediment volume would be derived from tributaries and the bed and bank of the lower river itself, rather than being directly attributable to releases from SCD. Localized outside bend bank failures and toe of bank failures (more likely in the upper portions of Reach 8) may result in localized loss of thin strips of mature riparian woodland and forest vegetation in this relatively wider riparian corridor. This reach has only very localized opportunities for creation of smaller, more isolated and discontinuous bars and benches for seral herbaceous, shrub, willow scrub and woodland succession (Denise Duffy & Associates 2000).

The complex of riparian, wetland, and coastal dune habitats associated with the lagoon and the associated riparian forest above the lagoon would not be expected to change

appreciably due to release of sediment over SCD. The dynamics of this area are controlled by other factors (Denise Duffy & Associates 2000).

4.5.2 ENVIRONMENTAL RESOURCES IMPACT STANDARDS AND METHODS

Standards of Significance

The following standards were obtained from the CEQA Appendix G Environmental Checklist Form for biological resources. An adverse impact on vegetation or wildlife would be significant and would require mitigation if construction or operation would:

- Have a substantial adverse effect either directly or through habitat modifications, on any species identified as a threatened or endangered, candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS;

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFG or USFWS;

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Permitting Issues

One of the requirements for the Proponent's Proposed Project as well as for Alternatives 1, 2, and 3 is the issuance by the USACE of a Clean Water Act Section 404 permit to dredge or fill Waters of the U.S. The application for a Section 404 permit for the Proponent's Proposed Project has been filed with the USACE. Section 7 of the ESA requires the USACE to consult with USFWS and NMFS whenever listed species may be affected by the action to be permitted. In this case, USFWS will be consulted concerning the CRLF, and NMFS will be consulted concerning the California South Central Coast steelhead trout. During this process, the USACE will prepare Biological Assessments for the relevant species and submit them to the respective agency. USFWS, in turn, will prepare a BO for the CRLF and NMFS will prepare a BO for the steelhead. If the action is found not to jeopardize the continued existence of the species, each BO will provide for appropriate mitigation to be made conditions of the Section 404 permit. The USFWS and NMFS each will include an "incidental take" statement as part of their BO if it appears that some individuals of the listed species will

be lost as a result of the permitted action. This ESA consultation process will proceed in parallel with NEPA review. The final Section 404 permit mitigation conditions could be the same as or in addition to any required NEPA/CEQA mitigation; ultimate jurisdiction over the selection, implementation and monitoring of mitigation measures lies with the appropriate federal agency.

Impact Assessment Methodology

Biotic resources surveys of the project study vicinity were conducted by Ecosystems West from April to August, 1997, with follow-up surveys during July 1998. Dr. Richard Arnold conducted a survey for Smith's blue butterfly in June 1997. ENTRIX, Inc. conducted additional field surveys from April to August 2005, including vegetation and special-status plant surveys. Special-status plant species surveys were conducted in May and July 2005. The 2005 plant survey report is provided in Appendix T. Surveys were conducted throughout the Project Area, including along the Tularcitos access road and existing access roads requiring improvements, at the concrete batch plant site, at the Dam itself (including the fish ladder), at the sediment disposal site, along the conveyor route to the sediment disposal site, and in those areas where sediment would be excavated.

Several special-status terrestrial wildlife species are known to occur or may occur in the Project Vicinity (MPWMD 1984). A list of special-status wildlife species with potential to occur in the Project Area was developed based on a review of literature and data sources that span over 90 years, including general wildlife references (Ingles 1965; Call 1978; Stebbins 2003; Small 1994); CDFG reports on special-status wildlife (Remsen 1978; Williams 1986; Jennings and Hayes 1994); California Wildlife Habitat Relationships (CWHR) species-habitat models (Zeiner et al. 1988, 1990a, 1990b), records from the CNDDB (CDFG 2005a), the catalogue records of the major northern California vertebrate museum collections (California Academy of Sciences 2005, Museum of Vertebrate Zoology 2005). Also used were records of known occurrences of special-status wildlife species and habitats in the region, previous wildlife studies conducted in the area, and consultant staff biologist's experience with the target species from the 2000 RDEIR.

Existing resource information and the results of the field studies conducted in 2005 were used to develop the description of the environmental setting. The resources described in that section were evaluated in conjunction with the activities associated with the Proponent's Proposed Project and the alternatives to determine potential impacts and develop mitigation measures.

Amphibian Surveys

ENTRIX biologists conducted amphibian surveys in 2005 to supplement those conducted earlier by other groups as specified in the section "Impact Assessment Methodology." The primary goals of the 2005 surveys were to determine the limits of pond and pool habitat upstream of San Clemente Reservoir along both major tributaries

that could support CRLF spawning and to locate other special-status amphibian and reptile species in the same reaches. The biologists surveyed these reaches on 12 and 13 July 2005, from early morning through late afternoon. They used information from the USFWS (1996) site assessment guidance for CRLFs as a framework for determining habitat potential. The biologists waded upstream at least one mile from the perceived terminus of the reservoir influence and returned downstream along waterways, noted pond and pool habitat, using binoculars to search for reptiles and amphibians along the shoreline and in the water. Although the primary objective was to assess habitat rather than to find individual amphibian and reptile specimens, special-status species were noted and mapped wherever they were found.

4.5.3 IMPACTS AND MITIGATION

The following impact issues, all related to construction, have been defined for Terrestrial Biology resources:

Impacts to Vegetation

- VE-1: Special-Status Plant Species (effects on virgate eriastrum or Lewis's clarkia populations)
- VE-2: Loss of Protected Oak Woodland (loss of oak woodlands)
- VE-3: Loss of other Native Vegetation (loss of native vegetation)
- VE-4: Indirect Effects on Native Vegetation (effects caused by increased erosion and sedimentation)

Impacts to Wildlife

- WI-1: Dam Strengthening (disruption of bat nesting habitat)
- WI-2: Removal of Ancillary Facilities (displacement of special-status bats)
- WI-3: Cofferdam Construction and Plunge Pool Dewatering (adverse effects to special-status species)
- WI-4: Notching Old Carmel River Dam (OCRD) (effects on spawning habitat and herpetofauna)
- WI-5: Concrete Batch Plant Construction and Operation (habitat for special-status species)
- WI-6: Tularcitos Access Road Construction (effects to special-status species)
- WI-7: Reservoir Drawdown (effects on California red-legged frog [CRLF] habitat)

- WI-8: Vegetation Removal (effects on special-status bird species and others protected by the Migratory Bird Treaty Act or raptor protections).
- WI-9: Pre-Existing Access Road Improvements (effects to special-status species)
- WI-10: Reservoir Drawdown or Elimination with Sediment Removal (effects on California red-legged frog [CRLF] habitat)
- WI-11: Sediment Removal (destruction of spawning habitat)
- WI-12: Sediment Transport and Disposal (adverse effects to special-status species)
- WI-13: Bypass Channel Excavation (loss of habitat for special-status species)

All of the above issues are construction-related impacts.

Proponent's Proposed Project (Dam Thickening)

Wildlife Impacts WI-2, WI-10, WI-11, WI-12, and WI-13 do not apply to the Proponent's Proposed Project.

Issue VE-1: Special-Status Plant Species

Effects on virgate eriastrum or Lewis's clarkia populations
Determination: ***less than significant with mitigation, short-term***

IMPACT

Populations of one special-status species were found near the Tularcitos Access Route. Some direct loss of the virgate eriastrum population could occur near the edge of the batch plant footprint. However, virgate eriastrum is on List 4 of the CNPS Inventory, and does not fall under specific state or federal regulatory authority.

MITIGATION

To the extent possible, potential impacts from construction activities would be avoided by avoiding populations of CNPS List 4 species.

Issue VE-2: Loss of Protected Oak Woodland

Loss of oak woodlands
Determination: ***less than significant with mitigation, long-term***

IMPACT

Construction activities could result in loss of 1 acre of oak woodlands protected by the Monterey County Oak Protection Ordinance. Construction of the Tularcitos Access Route would require the removal of coast live oak trees, and improvements to other access routes may also result in oak losses.

MITIGATION

Impacts to the stand of blue oak series would be avoided by confining the "high road" access improvement activity in the vicinity of this stand to the north side of the existing road. Fencing would be used to prevent construction activity from encroaching into the blue oak stand on the south side of the road.

The Botanical Resources Management Plan (Appendix U) would be finalized and implemented immediately following construction, with the following elements from the Monterey County Oak Protection Ordinance:

- Replace up to half the oak trees removed by access road and right abutment wall construction at a 3:1 ratio by planting seedlings or potted trees in appropriate habitat under the supervision of a qualified botanist;
- Derive all plant material from Carmel Valley area populations;
- Monitor plantings for at least five years after planting;
- Replant seedlings as necessary to replace seedlings that do not survive;
- Take other remedial action as necessary, including irrigation or protection from browsing animals such as deer, to ensure long-term survival of the plantings per the requirements of Title 16, Chapter 16.60, Monterey County Code;
- Provide or acquire a conservation easement sufficient to mitigate at least half the loss of oak trees, per Monterey County Code. The conservation easement would consist of lands elsewhere in the Carmel River watershed that support undeveloped blue oak stands.

Monterey County would be the regulatory authority responsible for oversight.

Issue VE-3: Loss of Other Native Vegetation

Loss of native vegetation
Determination: ***less than significant with mitigation, long-term***

IMPACT

Project activities are expected to result in loss of native vegetation, including several types of sensitive riparian habitat and oak woodland habitat.

The acreage of vegetation cover type that would be lost as a result of the Proponent's Proposed Project implementation is provided in Table 4.5-1. The total acreage of vegetation that would be lost is 3.4 acres. This number includes only the small portion of the Project Area that would be displaced by a constructed structure (i.e., the dam thickening, construction of the concrete batch plant, construction of the Tularcitos route, and improvements to the OCRD Bridge and other access routes). In addition, an

unquantified amount of riparian vegetation, as described in the sections below, could be lost due to de-watering and diversion.

Access Road Improvements

Improvement of existing roads for Proponent's Proposed Project access including access to the batch plant, plunge pool and upper dam face would result in some minor removal of native vegetation, including sensitive habitat due to widening and associated grading for large vehicles and construction equipment. The Project plans call for the access routes to be a 12-foot wide, one lane two-way road with radio traffic control. Widening would be required only in two segments totaling approximately 120 linear feet. The existing roads proposed for improvement pass through extensive areas of sensitive coast live oak series habitat that would likely be affected by the 120 linear foot widening.

The small area of sensitive blue oak series is located along the existing "high road" proposed for improvement and could also potentially be affected by road widening. Some sensitive central coast cottonwood-sycamore riparian forest habitat below SCD could be removed or disturbed by improvement of the plunge pool access road on the right (east) bank of the river; however, efforts would be made to minimize removal of trees. The pipeline access road would require widening of three narrow stretches and improvement to the switchback corner. Although the overall area to be disturbed and the number of trees potentially removed by the access road improvements are estimated to be relatively small, mature trees of coast live oak or riparian species would be removed.

Concrete Batch Plant

The proposed location of the batch plant is in open, disturbed grassland with scattered coast live oak, western sycamore, and mock-heather. Construction of the batch plant facility in this area would require some minor oak tree and mock-heather pruning and removal to access the site and incorporate the plant batching facilities and material stock piles. At least four oak trees in the open grassland would be removed to accommodate the batch plant and lay down area (Denise Duffy & Associates 2000).Other trees would be trimmed to provide access to the site. Mature trees of coast live oak or riparian species would be removed.

Table 4.5-1: Vegetation Type and Acreage Potentially Affected by Proponent's Proposed Project and Alternatives

Alternative	TOTAL	Annual grassland	Arroyo willow series	Blue oak series	Black sage series	Central Coast cottonwood-sycamore riparian forest	Chamise series	Chamise-black sage series	Coast live oak series	California sagebrush - black sage series	Developed	Emergent wetland	Mock heather scrub	Mulefat series	Mulefat-willow riparian	Ruderal	Sandbar	Sandbar annuals	California sycamore riparian-coast live oak	California sycamore riparian-mock heather scrub	California sycamore series	White alder riparian	White alder-willow riparian	Willow riparian
Proponent's Proposed Project	3.4	0.2	0.02	0.003	0.004	0.7	0.1	0.08	1.0	0.04	0.04	0	1.0	0	0	0.05	0	0	0.02	0.2	0.04	0	0	0
Alternative 1	41.8	3.8	0	0.003	0.004	1.3	0.6	0.6	20.1	0.1	0.2	0.02	0	0	0.02	0.01	0.4	1.8	0	0	0.04	0	11.9	1.0
Alternative 2	61.4	6.6	0	0.003	0.004	1.3	1.0	1.1	26.3	0.3	0.2	0.02	0	1.2	0.6	0.01	2.7	1.8	0	0	0.04	0.1	17.0	1.0
Alternative 3	44.7	7.1	0	0.003	0.1	0.2	1.5	0.3	9.6	0.0	0.04	0.02	0	1.2	0.6	0.01	2.0	1.8	0	0	0.04	0.1	18.9	1.0
Alternative 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Plunge Pool Area

Removal of or disturbance to some sensitive central coast cottonwood-sycamore riparian forest habitat could occur due to construction activities in the plunge pool area. Although most construction activity would take place in the dewatered plunge pool area, some riparian forest habitat may be removed in order to improve the plunge pool access road (described previously). The extent of riparian vegetation that may have to be removed would be minimal because the access road would be maintained as one-lane with radio control and abandoned and restored to its previous state after construction.

Left Abutment Staging Area

Use of the proposed left abutment staging area would likely require removal of some native vegetation, including sensitive habitat, on the upland between the access road and the canyon wall. Impacts, including removal of oak trees, could occur to coast live oak series habitat in this area.

Right Abutment Wall

The extension of the new 30 to 40-foot wall along the right embankment to tie the Dam into bedrock may result in the removal of a few mature trees on and at the base of the slope immediately adjacent to the right abutment. These could include coast live oaks as well as riparian species (California sycamore, polished willow). A small amount of chamise-black sage series habitat may also be removed as a result of construction of the new wall.

Diversion of Carmel River and San Clemente Creek

In order to avoid high turbidity in water released downstream during construction, the Carmel River water would be diverted into a pipeline and conveyed downstream of the Dam. A similar diversion may be required for San Clemente Creek. These diversions would result in the dewatering of the bypassed area. Lowering of the reservoir could dewater stands of emerging alder currently sprouting around the reservoir fringe. Diversion of water from the natural river channel below the Dam could result in local dewatering of riparian forest vegetation on adjacent banks.

MITIGATION

Appendix U, the Botanical Management Plan, includes provisions for restoration, mitigation, and monitoring of vegetation affected by the project. The USACE and CDFG would have regulatory authority over the measures in the Botanical Management Plan. The following mitigation activities have been summarized from Appendix U:

The proposed access road improvements, the batch plant and laydown areas, plunge pool access, and the abutment staging areas would be designed to minimize loss of native vegetation. Unnecessary clearing of, or disturbance to, native vegetation outside the road right-of-way would be avoided.

Fencing would be used to prevent any encroachment of vehicles or project activity into undisturbed native habitat or within the dripline of native trees outside the designated batch plant and laydown site, the plunge pool area and the left and right abutment areas.

Project outflows would be designed to diffuse water rather than allow it to flow out in a concentrated stream. Outflows would be placed so as to minimize bank erosion from altered flows. The temporary outflow below the plunge pool would be designed to minimize alterations of the hydrologic regime that support the riparian forest habitat on the adjacent floodplain.

Supplemental irrigation would be provided to alders around the reservoir fringe when the reservoir is dewatered and to riparian vegetation above the bypass outflow.

Disturbed areas or areas of annual grassland habitat between the left abutment and the existing residence would be used to the maximum extent available for the left abutment staging area.

Riparian forest would be revegetated at a 3:1 ratio for trees removed, including the cottonwood-sycamore riparian forest below SCD at the plunge pool staging area and access road, and any riparian species disturbed at the site of the right abutment wall.

The CDFG would be the regulatory authority responsible for oversight of the riparian vegetation. Monterey County would be the regulatory authority responsible for oversight of the replacement of the oak trees.

Issue VE-4: Indirect Effects on Native Vegetation

Effects caused by increased erosion and sedimentation
Determination: ***less than significant with mitigation, short-term***

IMPACT

Project construction activities may result in indirect adverse impacts to vegetation, including increased erosion and sedimentation, damage to roots of oaks and other tree species adjacent to areas where heavy equipment would be operated, dust impacts to roadside vegetation, and colonization of exposed substrate by exotic plant species.

MITIGATION

Standard erosion and sedimentation control BMPs would be implemented for all grading, filling, clearing of vegetation, or excavating that occurs in site preparation (see Section 4.3 Water Quality and the Botanical Resources Management Plan (Appendix U) and SWPPP in Appendix K). Road widening would be designed to avoid placing fill above canyon walls.

With the assistance of a qualified hydrologist, all road widening and improvements would be designed to avoid or minimize alterations of existing drainage patterns that

could lead to increased erosion and sedimentation. Appropriate erosion control technology (BMPs) would be employed during all phases of access road construction (see Section 4.3 Water Quality and the Botanical Resources Management Plan (Appendix U) and SWPPP in Appendix K). Construction work would be scheduled to occur during the dry season.

Excavation and operation of construction vehicles off of the right-of-way would be prohibited within the dripline of oak and other tree species.

To minimize dust, unpaved access roads would be frequently watered using a sprayer truck during periods when trucks and other construction vehicles are using the roads, except during periods when precipitation has dampened the soil enough to inhibit dust (see Section 4.7 Air Quality).

Cut slopes, fill areas, denuded areas, and any other areas where existing vegetation cover would be removed outside the roadway would be revegetated with an appropriate seed mix. This seed mix would be selected with the assistance of a qualified revegetation specialist with demonstrated experience and expertise in revegetation, and would contain native species that are indigenous to the Project Area. If enough native seed is not available, and non-natives must be included in the seed mix, these would be species known not to be invasive or persistent. The seed mix would contain native species known to compete well against invasive non-native species.

Monitoring would be conducted by a qualified hydrologist and revegetation specialist of all revegetated areas and all areas identified as potential problem areas for erosion and sedimentation from access road construction. Remedial action would be implemented if revegetation were not successful or if significant erosion and sedimentation problems are observed during monitoring.

All revegetated or disturbed areas would be monitored annually for invasive non-native plant species, particularly French broom and pampas grass, for five years following completion of Phase 1 construction, with the assistance of a qualified botanist. If invasive species are becoming established on areas disturbed by project activities during the five-year period, invading species would be removed at times that preclude the plants from setting new seed.

Issue WI-1: Dam Strengthening

Disruption of bat nesting habitat
Determination: ***less than significant with mitigation, short-term***

IMPACT

Potential nesting or roosting habitat for bats (pallid bat, California mastiff bat, and Townsend's big-eared bat) occurs in rock crevices on the slope where the new right abutment wall would be constructed. This is a potentially significant, short-term impact.

MITIGATION

A preconstruction survey would be conducted for bat roosts in rock crevices in the right embankment area. If bats are observed nesting or roosting in the area, as set forth in Appendix V, Protection for Special Status Species, USFWS or CDFG would be notified (depending on the regulatory status of the species) and mitigation measures previously agreed-upon with the agency would be implemented. Such measures may include establishment of buffer zones or installation of exclusion barriers under the supervision of a qualified bat biologist. These mitigation measures would reduce the impact to a less than significant, short-term impact.

Issue WI-3: Cofferdam Construction and Plunge Pool Dewatering

Adverse effects to special-status species
Determination: ***significant, unavoidable, short-term; long-term beneficial with mitigation***

IMPACT

The construction of a cofferdam and subsequent draining of the plunge pool could adversely affect any CRLFs, western pond turtles and other special-status species that may be present. These species typically inhabit freshwater pools and their margins (Stebbins 2003). Draining the pool could leave western pond turtles and adult CRLFs vulnerable to predation, and larval CRLFs vulnerable to predation and to desiccation. This is a potentially significant short-term impact.

MITIGATION

The Proponent's Proposed Project and Alternatives 1, 2, and 3 would require a agreements with CDFG. Such agreements may contain conditions requiring mitigation that could be the same as or in addition to the NEPA/CEQA mitigation outlined in this document. This section 4.5 addresses NEPA/CEQA mitigation for Vegetation and Wildlife (other than fish). Fisheries resources are covered in Section 4.4 and Wetlands in Section 4.6.

See Appendix V for the Protection Measures for Special Status Species which address mitigation and monitoring of special status species affected by the project. The USFWS, NMFS and CDFG would have regulatory authority over the mitigation measures listed in Appendix V, but the Protection Measures would address the following activities:

Loss of California red-legged frogs and western pond turtles may occur during rescue operations associated with construction activities. Loss of California red-legged frogs may occur due to handling of frogs during relocation, and because some relocated frogs and tadpoles may fail to adjust to the new environment at the ponds used for relocation. Potential losses would be incorporated into the USFWS BO for the project.

Prior to the construction of the cofferdam and subsequent draining of the plunge pool, a preconstruction survey would be conducted for California red-legged frogs and western

pond turtles at the plunge pool and downstream to the point at which the bypass pipeline would discharge water into the river.

The preconstruction survey for California red-legged frogs would be consistent with the most recent USFWS survey guidance (USFWS 2007). If California red-legged frogs are observed in the area, the USFWS would be notified and California red-legged frogs would be captured and relocated by a USFWS-approved biologist to nearby suitable habitat. Erosion control fencing or a similar barrier would minimize movement of frogs back into work areas. A biological monitor would accompany the crew during excavation and installation of the fence to prevent harm to frogs that may be active along the fence route. The survey and relocation program would be updated, if necessary, to be consistent with a mitigation plan to be developed in cooperation with the USFWS and to be consistent with any terms and conditions required in the BO to be developed as part of the ESA Section 7 consultation.

A California red-legged frog population monitoring and bullfrog eradication program (CRLF Program) would be developed and implemented as part of the Protection Measures (Appendix V), in consultation with the USFWS. During this consultation, the Protection Measures (Appendix V) would be finalized. The CDFG would also be consulted as part of its permitting process. The CRLF Program would assess and monitor the relative abundance of bullfrogs and CRLFs in the reservoir and its upper reaches. Relocation of CRLF would use techniques and procedures approved by USFWS and CDFG and would commence after April 15, to allow all CRLF eggs to hatch and the tadpoles to grow large enough to be easily identified and differentiated from bullfrog tadpoles.

The CRLF Program would include bullfrog eradication to remove adults, subadults, and egg masses from the reservoir and its upper reaches. Bullfrog eradication would be implemented to give the native frog species a “head start” within project-affected reaches and upstream enhancement/mitigation sites.

The bullfrog eradication program would be implemented during the construction and/or drawdown period between June and December. All methods and techniques would be lawful and in accordance with the CDFG Code. Only USFWS-approved biologists would be delegated to identify and destroy egg masses and larval forms of bullfrogs. The program would also include an assessment of bullfrog diet in order to determine the future need for any bullfrog control in the Project Area and areas nearby. Concurrent control and monitoring of other non-native predators (e.g., crayfish [*Pacifasticus leniusculus*] and centrarchid fishes) may be included in the program in order to minimize adverse impacts of the project on CRLFs and other aquatic species. The monitoring and bullfrog eradication program would be implemented for two to three years during project construction.

Monitoring of CRLF and bullfrog populations would be continued for two years following completion of the project. If monitoring conducted during and after construction activities

indicate that bullfrog populations in enhancement and mitigation sites are increasing and CRLF populations are decreasing, the bullfrog eradication program may be continued for an additional two years. Annual reports would be submitted to the appropriate regulatory agencies, including but not limited to, USFWS, the USACE, and CDFG.

For a number of years, pursuant to an agreement with USFWS, CAW has implemented annual CRLF surveys of breeding and rearing sites and has conducted frog relocations along the Carmel River during the dry season in addition to constructing enhanced frog habitat in several locations. As part of the CRLF Program, additional CRLF habitat mitigation sites would be restored and monitored. Potential sites would be identified within the Carmel River and potentially in off-stream sites suitable for breeding. Qualified personnel would conduct periodic inspections of CRLF enhancement and mitigation sites to assure that habitat objectives for each site are sufficiently met, i.e., that physical conditions (e.g., basin sediment deposit and overhead vegetation) and bullfrog populations are conducive to CRLF reproduction. Mitigation monitoring would be conducted during construction and for an additional two years afterwards, for a total period of at least five years. Implementation and reporting would be concurrent with the CRLF Program described above.

If western pond turtles are observed in the area, attempts would be made by a CDFG approved biologist to capture (trap/net) and relocate western pond turtles. Western pond turtles are usually relocated to a nearby downstream pond or a pool reach of a stream. Construction fencing would be installed to prevent relocated frogs or turtles from returning to the area during the construction period.

Although potential capture and relocation of CRLF individuals could result in loss of an ESA-listed species, the measures described above, as well as compliance with future terms and conditions of the USFWS BO, would minimize the impact.

A biological monitor would be placed at the construction site for the duration of the cofferdam construction and the draining of the plunge pool. The biological monitor for amphibians and reptiles would coordinate with the fisheries biologist so that both are present during fish rescue operations. This would facilitate the safe removal and relocation of any remaining CRLFs and pond turtles. Two-striped garter snakes and common garter snakes (*Thamnophis sirtalis*) may congregate around the plunge pool as it recedes and could become a potentially serious source of predation on juvenile CRLFs and native fish. These snakes would be captured by a biologist qualified to handle special-status reptiles (two-striped garter snake) and released up to one-quarter mile downstream in the Carmel River. These measures, as well as implementation of any conditions that might be required by USFWS and DFG, including conditions that may be part of the USFWS BO, would minimize loss of special status species to the fullest extent practicable.

While it is difficult to determine whether the loss of CRLFs and other species that are not rescued or that are injured or die during rescue and relocation operations is significant, these losses along with the temporary loss of habitat for the red-legged frog cannot be fully mitigated and would be significant in the short- term. However, the CRLF Program, which is discussed in mitigation for Issue WI-3 (Cofferdam Construction and Plunge Pool Dewatering) would restore additional sites as mitigation habitat for CRLFs and other species. This mitigation would improve habitat and provide a long-term beneficial impact.

Issue WI-4: Notching Old Carmel River Dam (OCRD)

Effects on spawning habitat and herpetofauna
Determination: ***less than significant with mitigation, short-term***

IMPACT

Instream work during the notching operation of the OCRD could damage CRLF summer habitat, and could possibly damage spawning habitat downstream of the Dam. It could also affect western pond turtle, two-striped garter snake, foothill yellow-legged frog, and Coast Range newt habitat or individuals. However, foothill yellow-legged frog has not been documented there. Sedimentation, elevated turbidity, and direct deposit of construction materials in the stream would be the most likely causes of impacts. This is a potentially significant short-term impact.

MITIGATION

Prior to dam notching operations, USFWS (2007) "protocol" surveys would be conducted for CRLFs along the Carmel River up to one-half mile downstream of OCRD. Other special-status aquatic species would be surveyed concurrently. If work on the Dam is interrupted for more than two weeks, protocol surveys would be repeated if the initial surveys indicated the presence of special-status species habitat or populations. CRLF populations are known to occur in this reach. The CRLF mitigation is provided in mitigation measures for Issue WI-3 (Cofferdam Construction and Plunge Pool Dewatering) and in the Protection Measures (Appendix V).

The area involved is localized to the notching area allowing flow in the river to continue downstream. The sheetpiling of the notching area would occur during one construction season. With the addition of these mitigation measures, the impact would be reduced to a less than significant, short-term impact.

Issue WI-5: Concrete Batch Plant Construction and Operation

Habitat for special-status species
Determination: ***less than significant with mitigation, short-term***

IMPACT

Construction of the batch plant and associated facilities may temporarily impact available habitat for California horned lizard. Although lizards were not observed during

field surveys, suitable open habitat for these lizards may occur along the Carmel River; MPWMD staff have reported seeing lizards on existing roads in the vicinity of the proposed batch plant.

CRLFs are known to occur in the Carmel River immediately adjacent to the proposed site for the concrete batch plant. CRLFs could be directly and indirectly impacted by construction and use of a concrete batch plant in this location. Constructing the concrete plant has the potential to result in destruction of upland habitat for the CRLF, and any inadvertent spill of materials could lead to contamination of the Carmel River downstream of the Project Area.

Operation of the proposed batch plant would not result in direct or indirect impacts to Cooper's hawk and yellow warblers, since the plant is more than 2,000 feet from the active Cooper's hawk nest and warbler nesting area. However, increased construction vehicle traffic from the batch plant to the dam site could cause increased noise and dust.

This is a potentially significant, short-term impact.

MITIGATION

A preconstruction survey would be conducted for California horned lizards and CRLFs. Results would be reported to the USFWS and CDFG. If horned lizards are found, standard mitigation measures would be implemented, including relocating horned lizards to a safe area outside of the area and installing erosion control fencing or a similar barrier to minimize movement of horned lizards back into work areas. The barrier would be buried at least 3 to 6 inches in the ground. Mesh size would not exceed one-half inch and material would be heavy gauge polybutylene or equivalent. A biological monitor would accompany the crew during excavation and installation of the fence to prevent harm to horned lizards that may be active along the fence route.

If CRLFs are found, CRLF mitigation would be the same as the Mitigation Measure for Issue WI-3 (Cofferdam Construction and Plunge Pool Dewatering) and as specified in the Protection Measures (Appendix V).

Spill control measures would be implemented if the concrete batch plant were constructed. This measure would minimize the risk of contamination of the Carmel River downstream of the Project Area see preliminary SPCC Plan (Appendix R) .

A preconstruction survey would be conducted to determine if the Cooper's hawk nest is active at the onset of construction. If the nest is active, this would be reported to CDFG and a noise abatement program would be implemented for passing vehicles. The program would include standard mitigation measures, such as prohibiting the use of air horns or jake (engine) brakes. Construction vehicles would be prohibited from parking near the CVFP and traffic would be directed as far away from the nest as practical. Gravel or crushed rock would be placed to buffer noise and minimize dust generation in

vicinity of nest (see Section 4.7 Air Quality for dust abatement measures). Existing native vegetation would be maintained between the nest and the existing road corridor, including the large valley oak tree west of Settling Pond Number 1.

These mitigation measures would reduce the impact to a less than significant, short-term impact.

Issue WI-6: Tularcitos Access Road Construction

Effects to special-status species
Determination: ***less than significant with mitigation, short-term***

IMPACT

Construction of the new Tularcitos access route could affect Monterey dusky-footed wood rat, coast horned lizard, pallid bat, CRLF, western pond turtle, two-striped garter snake, yellow warbler and other special-status wildlife species. Construction could damage or destroy a known Monterey dusky-footed wood rat nest located near Tularcitos Creek. Monterey dusky-footed wood rat habitat could be affected by vegetation and tree removal and by grading operations. Individual animals could be harmed by direct destruction of previously unknown nests. Damage to coast horned lizards could result from grading operations and direct injury or killing of individual animals. Potential impacts to special-status birds include potential disturbance to breeding individuals during the nesting season, particularly if nests occur in or adjacent to the construction sites. Impacts could include direct loss of eggs or nestlings; indirect displacement from increased noise and human presence in the vicinity of the construction activity; and a reduction in foraging habitat. Possible impacts to breeding birds will depend on a number of variables, including species affected, nest location, topographical shielding, breeding phenology, and type of construction activity. Damage to potential pallid bat roosting habitat would result from the destruction of rock outcrops and other formations. The impacts associated with construction would be only during CY 3.

Damage to aquatic habitat could result from erosion and other sediment and rubble discharge into the Carmel River and possibly Tularcitos Creek. This increased sediment load could further degrade habitat for the CRLF downstream of the Project Area. Impacts associated with erosion would occur during the construction phase as well as operations. This would be a potentially significant impact.

MITIGATION

Tree removal would be restricted to the minimum number of trees necessary to allow access by construction vehicles.

A preconstruction survey would be conducted for Monterey dusky-footed wood rats and wood rat nests in areas of proposed access road widening or improvement. The access road width is expected to be 20 feet or less. If wood rat nests were found, they would be reported to CDFG and flagged for avoidance. Wood rats may use more than one nest

and may move from nest to nest as they forage within their home range,Their nest serves as a place of residence to store food and bear their young (Laudenslayer 1999). Due to this dependency, nests are of particular importance to wood rats and disturbance to them should be avoided. Stakes, flags or plastic tape would be used to enforce avoidance. If any wood rat nests are found that cannot be avoided, trapping and relocation of the wood rat(s) upstream or to a suitable adjacent stream nearby will be implemented according to CDFG requirements.

To the extent possible with other construction constraints, vegetation removal will be accomplished between August 1 and March 1. If any vegetation removal must be conducted between March 1 and August 1, pre-construction surveys for breeding birds (either special-status or others protected by the Migratory Bird Treaty Act and the California Migratory Bird Act) would be conducted in these areas. If any active nests were found, they would be isolated by a species-specific buffer area (from 50 to 500 feet) and avoided until the eggs were hatched and the nestlings fledged.

Effects on special-status wildlife and their habitat would be mitigated through preconstruction surveys, rescue and relocation operations, predator control, and the development of other measures through consultation based on the results of surveys. Erosion controls, including erosion control fencing, would minimize loss of construction material along existing roads that are cut into the slope of the Carmel River canyon, as well as along the plunge pool access road as specified (Section 4.1 Geology and Soils and Appendix K, SWPPP). This would minimize direct impacts to western pond turtles, two-striped garter snakes, CRLFs, and Coast Range newt from falling debris. These barriers also would keep California horned lizards and western pond turtles out of the construction and traffic corridor. Such barriers would be buried at least 3 to 6 inches in the ground.

Conducting pre-construction surveys of rock outcrops and other formations along the Tularcitos route would provide a basis for mitigating impacts to pallid bat roosts, if any are present. Surveys would be conducted by a biologist with expertise in bat biology who would use visual survey techniques and acoustic monitoring equipment to determine whether pallid bats are likely to use any of these structures. If evidence of pallid bat use is discovered, roost sites would be mapped by GPS and flagged in the field. Construction would be routed to avoid roost sites. Additional measures would be implemented at any roost site that cannot be avoided. Such measures may include establishment of buffer zones or installation of exclusion barriers under the supervision of a qualified bat biologist. More details are provided in the Preliminary Draft of the Protection Measure for Special-status Species (Appendix V).

These mitigation measures would reduce the impact to a less than significant, short-term impact.

Issue WI-7: Reservoir Drawdown without Sediment Removal

Effects on CRLF habitat
Determination: ***significant, unavoidable, short-term; long-term beneficial with mitigation***

IMPACT

The Interim Seismic Safety Measures for SCD have been conducted for five years and the same successfully implemented procedures would be utilized during construction of the Proponent's Proposed Project. However, during construction, the target elevation would be lowered to 510 ft rather than the 515.5 ft designated in the Interim Seismic Safety Measures. The reservoir drawdown would be implemented during the low flow season but would result in short-term removal of CRLF habitat in this area during CY 4 from June through December. After construction the elevation would be returned to the current baseline elevation of 525 ft.

The upper reaches of the reservoir that are currently occupied by extensive sandy sediment plains could eventually become habitat for the CRLF. At the time they were surveyed, portions of these sediment plains provided substrate for cattail and bulrush colonization. CRLFs were found in this area during the 1997 surveys of the reservoir and during the Interim Seismic Safety Measures survey and rescue operations. Lowering the water elevation could leave western pond turtles and adult CRLFs vulnerable to predation, and larval CRLFs vulnerable to predation and to desiccation. This is a potentially significant short-term impact.

MITIGATION

During fish rescue operations (see Section 4.4 Fisheries), a USFWS-approved biologist would be present to relocate any CRLFs, including subadults and tadpoles. Frogs captured would be removed and either released or relocated according to a predetermined relocation plan. The CRLF mitigation would be the same as the Mitigation Measure for Issue WI-3 (Cofferdam Construction and Plunge Pool Dewatering) and as specified in the Protection Measures (Appendix V).

While it is difficult to determine whether the loss of CRLFs and other species that are not rescued or that are injured or die during rescue and relocation operations is significant, these losses, along with the temporary loss of habitat for the red-legged frog, cannot be fully mitigated and would be significant in the short-term. However, the CRLF Program, which is discussed in mitigation for Issue WI-3 (Cofferdam Construction and Plunge Pool Dewatering) would restore additional sites as mitigation habitat for CRLFs and other species. This mitigation would improve habitat and provide a long-term beneficial impact.

Issue WI-8: Vegetation Removal and Construction-Related Disturbance

Effects on Special-Status Bird Species and Others Protected by the Migratory Bird Treaty Act or Raptor Protections
Determination: ***less than significant with mitigation, short-term***

IMPACT

Potential impacts to special-status birds from vegetation removal and other construction activities include potential disturbance to breeding individuals during the nesting season, particularly if nests occur in or adjacent to the construction sites. Impacts could include direct loss of eggs or nestlings; indirect displacement from increased noise and human presence in the vicinity of the construction activity; and a reduction in foraging habitat. Possible impacts to breeding birds will depend on a number of variables, including species affected, nest location, topographical shielding, breeding phenology, and type of construction activity. These impacts are potentially significant short-term impacts.

MITIGATION

To the extent possible with other construction constraints, vegetation removal would be accomplished between August 1 and March 1. If any vegetation removal must be conducted between March 1 and August 1, pre-construction surveys for breeding birds (either special-status or others protected by the Migratory Bird Treaty Act and the California Migratory Bird Act) would be conducted in these areas. If any active nests were found, they would be isolated by a species-specific buffer area (from 50 to 500 feet) and avoided until the eggs were hatched and the nestlings fledged.

These mitigation measures would reduce the impact to a less than significant, short-term impact.

Issue WI-9: Pre-Existing Access Road Improvements

Effects to special-status species
Determination: ***less than significant with mitigation, short-term***

IMPACT

The only pre-existing access road improvements for the Proponent's Proposed Project are improvements to San Clemente Drive. Widening and improving existing access roads could potentially result in minor indirect impacts to Monterey dusky-footed wood rat, pallid bat, and other special-status wildlife species. Use of the Center Court Drive access road would reduce impacts affecting known Monterey dusky-footed wood rat nest located near Tularcitos Creek, but may indirectly impact a nest that was observed above the road in July 1998.

Widening of the existing access roads may disturb trees that provide nesting structures for Monterey dusky-footed wood rats. If large amounts of fill from construction were to enter into the Carmel River this could directly injure or kill western pond turtles, two-

striped garter snakes, or CRLFs. Use of the left abutment staging area, as planned, should have less than significant impacts on special-status wildlife species in the area.

These impacts are potentially significant, short-term impacts

MITIGATION

Tree removal would be restricted to the minimum number of trees necessary to allow access by construction vehicles.

Impacts to Monterey dusky-footed wood rat would be mitigated by using global positioning software (GPS) to indicate the location of the existing Monterey dusky-footed wood rat nest relative to the proposed route on project construction maps. A survey would be conducted to identify other active Monterey dusky footed wood rat nests along the proposed route. Any nests found would be mapped and flagged in the field, and construction routes and activities would be planned to avoid the nests. Tree removal would be restricted to the minimum number of trees necessary to allow access by construction vehicles.

Conducting pre-construction surveys of rock outcrops and other formations along the access route would provide a basis for mitigating impacts to pallid bat roosts, if any are present. Surveys would be conducted by a biologist with expertise in bat biology who would use visual survey techniques and acoustic monitoring equipment to determine whether pallid bats are likely to use any of these structures. If evidence of pallid bat use is discovered, roost sites would be mapped by GPS and flagged in the field. Construction would be routed to avoid roost sites.

Impacts to CRLFs, foothill yellow-legged frogs, western pond turtles, and two-striped garter snakes along the Carmel River would be mitigated by erosion Best Management Practices (BMPs) to protect the Carmel River channels (see Section 4.3 Water Quality) and the SWPPP in Appendix K).

These mitigation measures would reduce the impact to a less than significant, short-term impact.

Alternative 1 (Dam Notching)

The Project Area for Alternative 1 encompasses vegetation and other terrestrial biological resources along existing access roads requiring improvements, and at the Dam itself (including the fish ladder). In addition, this alternative encompasses the sediment disposal site, the conveyor route to the sediment disposal site, and those resources currently occupying the sediment that would be excavated. The abutment work described for the Proponent's Proposed Project would not be included, nor would improvements to Tularcitos Road, but improvements to the existing Jeep Trail extending from the Cachagua Road to the sediment disposal site and from the Jeep Trail to the reservoir would be required for this alternative as well as Alternatives 2 and 3.

The transport and disposal of 1.5 million cubic yards of sediment would result in the removal of numerous coast live oak trees (see Issue VE-1 Special-Status Plant Species above). Riparian species also would be impacted at the reservoir end of the conveyor route. Removal of mature trees of coast live oak or riparian species would be a significant, mitigable impact.

Types of potential impacts to terrestrial botanical resources from Alternative 1 are similar to those described for the Proponent's Proposed Project above, but would impact 41.8 acres (see Table 4.5-1). There would be additional impacts at the sediment disposal site and access route described below in Issues WI-9 through WI-12.

Wildlife Issues WI-1 (Dam Strengthening), WI-5 (Concrete Batch Plant), WI-6 (Tularcitos Access Road Improvements), WI-7 (Reservoir Drawdown without Sediment Removal) and WI-13 (Bypass Channel Excavation) would not occur under Alternative 1. Impacts and mitigation for Issues WI-3 (Cofferdam Construction and Plunge Pool Dewatering), and WI-4 (Notching Old Carmel River Dam) would be the same as the Proponent's Proposed Project.

Issue VE-1: Special-Status Plant Species

Effects on virgate eriastrum or Lewis's clarkia populations
Determination: ***less than significant with mitigation, short-term***

IMPACT

Populations of Lewis's clarkia were found along the existing access road from Cachagua Road and at the sediment disposal site. Improvements made to this road for construction access could result in additional impacts to this species. However, both virgate eriastrum and Lewis's clarkia are on List 4 of the CNPS Inventory, and do not fall under specific state or federal regulatory authority.

MITIGATION

To the extent possible, potential impacts from construction activities would be avoided by avoiding populations of CNPS List 4 species.

Issue VE-2: Loss of Protected Oak Woodland

Loss of oak woodlands
Determination: ***less than significant with mitigation, long-term***

IMPACT

Construction activities could result in loss of 20.1 acres of oak woodlands protected by the Monterey County Oak Protection Ordinance. Improvements to access routes may also result in oak losses. Most of the loss of oak woodland would occur at the sediment disposal site and the conveyor route to this site.

MITIGATION

The Proponent's Proposed Project Mitigation Measure VE-2 (Loss of Protected Oak Woodland) would be implemented. Mitigation would be more extensive than for the Proponent's Proposed Project because the amount of oak woodlands is greater for Alternative 1 as shown in Table 4.5-1.

Issue VE-3: Loss of Other Native Vegetation

Loss of native vegetation
Determination: ***less than significant with mitigation, long-term***

IMPACT

Project activities are expected to result in loss of native vegetation, including several types of sensitive riparian habitat and oak woodland habitat. This would be a significant, mitigable, impact.

The acreage of vegetation cover type that would be lost as a result of Alternative 1 is provided in Table 4.5-1. The total acreage of vegetation that would be lost is 41.8 acres. The impact characterization would be the same as described for Impact VE-3 (*Loss of Other Native Vegetation*) under the Proponent's Proposed Project but the quantum of impact would be greater. It would be a less than significant impact as described under Impact Issue VE-3 for the Proponent's Proposed Project.

MITIGATION

The Proponent's Proposed Project Mitigation Measure VE-3 (Loss of Other Native Vegetation) would be implemented. Mitigation would be more extensive than for the Proponent's Proposed Project because the amount of oak woodlands is greater for Alternative 1 as shown in Table 4.5-1.

Issue VE-4: Indirect Effects on Native Vegetation

Effects caused by increased erosion and sedimentation
Determination: ***less than significant with mitigation, short-term***

IMPACT

Project activities may result in indirect impacts to vegetation, including increased erosion and sedimentation, damage to roots of oaks and other tree species adjacent to areas where heavy equipment would be operated, dust impacts to roadside vegetation, and colonization of exposed substrate by exotic plant species. This would be a significant, mitigable impact.

MITIGATION

The Proponent's Proposed Project Mitigation Measure VE-4 (Indirect Effects on Native Vegetation) would be implemented.

Issue WI-2: Removal of Ancillary Facilities

Displacement of special-status bats
Determination: ***less than significant with mitigation, short-term***

IMPACT

Removing the valve house from atop SCD and removing other anthropogenic structures from near the Dam may displace special-status bat species from traditional roosts.

Unidentified species of bats use the valve house and other nearby buildings as day roosts. Removing those structures would displace roosting bats and may increase mortality if the structures are removed when newborn or very young bats are present in the roosting colonies. This could be a potentially significant short-term impact.

MITIGATION

Proponent's Proposed Project Mitigation Measure Issue WI-1 (Dam Strengthening) would be implemented. If possible, structure removal would be scheduled after juvenile bats are weaned and capable of flight, as determined by a biologist with expertise in bat biology. These mitigation measures would reduce the impact to a less than significant, short-term impact.

Issue WI-8: Vegetation Removal and Construction-Related Disturbance

Effects on Special-Status Bird Species and Others Protected by the Migratory Bird Treaty Act or Raptor Protections.
Determination: ***less than significant with mitigation, short-term***

IMPACT

Potential impacts to special-status birds from vegetation removal and other construction activities, including potential disturbance to breeding individuals during the nesting season, would be similar to those for the Proponent's Proposed Project, but a greater extent of vegetation and potential habitat for breeding birds would be affected.

MITIGATION

Proponent's Proposed Project Mitigation Measure WI-8 (*Vegetation Removal and Construction-Related Disturbance*) would be implemented.

Issue WI-9: Pre-Existing Access Road Improvements

Effects to special-status species
Determination: ***less than significant with mitigation, short-term***

IMPACT

Improvements to the existing Jeep Trail extending from the Cachagua Road to the sediment disposal site and the construction of the conveyor route from the Jeep Trail to the reservoir would be required for Alternative 1, 2 and 3. Widening and improving this

road could potentially result in minor indirect impacts to Monterey dusky-footed wood rat and other special-status wildlife species using vegetation in the construction zone, including oak woodlands.

Potential impacts to special-status birds include potential disturbance to breeding individuals during the nesting season, particularly if nests occur in or adjacent to the construction sites. Impacts could include direct loss of eggs or nestlings; indirect displacement from increased noise and human presence in the vicinity of the construction activity; and a reduction in foraging habitat. Possible impacts to breeding birds will depend on a number of variables, including species affected, nest location, topographical shielding, and breeding phenology. The impact associated with construction would be only during CY 3.

MITIGATION

Tree removal would be restricted to the minimum number of trees necessary to allow access by construction vehicles.

Pre-construction surveys of the Jeep Trail would be conducted by qualified wildlife biologists, to assess the likely presence or habitat use by any special-status wildlife species. If listed species habitat or individuals could be harmed, Best Management Practices, included in the Protection Measures for Special Status Species Plan (Appendix V), would be developed to avoid or mitigate impacts to special-status wildlife species habitat or individuals.

Issue WI-10: Reservoir Drawdown or Elimination with Sediment Removal

Effects on California red-legged frog (CRLF) habitat
Determination: ***significant, unavoidable, short-term; long-term beneficial with mitigation***

IMPACT

Reservoir drawdown may strand CRLF tadpoles away from pool habitat and may also isolate transformed and adult CRLFs far enough from moisture sources to cause desiccation and death. As pools decline, CRLFs and tadpoles may also become increasingly vulnerable to predation and to inter- and intraspecific competition, as well as to weather extremes. The drawdown may also isolate western pond turtles and potentially impact juveniles by severely limiting available cover and forage. Adult western pond turtles can disperse safely independently of moisture and most weather conditions, but juveniles and hatchlings may be killed or injured during the drawdown.

This could be a potentially significant, short-term impact.

MITIGATION

A biologist permitted and approved by the USFWS to relocate California red-legged frogs and western pond turtles would monitor and oversee all terrestrial wildlife-related activities associated with the drawdown and subsequent activities in the reservoir bed.

As the drawdown commences and the reservoir water level declines, the USFWS-approved biologist and crew would rescue CRLFs and tadpoles and western pond turtle juveniles and hatchlings from the inlet streams and pools in the sediment bed, and relocate them to appropriate aquatic habitat at previously selected secure sites within one mile of San Clemente reservoir. The detailed relocation program for CRLFs is discussed under the mitigation measure for the Proponent's Proposed Project Issue WI-3 (Cofferdam Construction and Plunge Pool Dewatering) and in the Protection Measures for Special Status Species (Appendix V). Other native wildlife taken incidentally during these operations would be transported to secure habitat (which may be the same sites selected for relocation of CRLFs and tadpoles and western pond turtle juveniles and hatchlings). This operation would continue throughout the reservoir drawdown, vegetation clearing, and sediment excavation operations (see Mitigation Measure WI-11 (Sediment Removal); hand vegetation clearing, as detailed in Mitigation Measure WI-11, would commence immediately after the drawdown begins).

While it is difficult to determine whether the loss of CRLFs and other species that are not rescued or that are injured or die during the rescue and relocation operations is significant, these losses along with the temporary loss of habitat for the red-legged frog cannot be fully mitigated and would be significant in the short-term. However, the CRLF Program, which is discussed in mitigation for Issue WI-3 (Cofferdam Construction and Plunge Pool Dewatering) would restore additional sites as mitigation habitat for CRLFs and other species. This mitigation would improve habitat and provide a long-term, beneficial impact.

Issue WI-11: Sediment Removal

Destruction of spawning habitat
Determination: ***significant, unavoidable, short-term; long-term beneficial with mitigation***

IMPACT

Removing the sediment from San Clemente Reservoir to a level below the dam notch would adversely affect nearly all extant CRLF spawning and summer habitat within the reservoir. Spawning habitat would regenerate and become suitable in perhaps as little as a few months. Some loss would occur either during removal of CRLFs and tadpoles, Coast Range newt larvae, and western pond turtle juveniles and hatchlings from the sediment bed before commencing vegetation removal or sediment excavation, or if individuals are missed in the rescue operation. These impacts are potentially significant short-term impacts.

MITIGATION

Mitigation Measure WI-3 (Cofferdam Construction and Plunge Pool Dewatering) would be implemented. The monitoring biologist and crew would capture and relocate all CRLFs. Prior to any sediment excavation and before CRLFs have been cleared completely from the reservoir bed, vegetation on the sediment bed would be removed with chainsaws and other handheld cutting devices (except "weedwhackers"). Vegetation removed with hand tools would be limited to no lower than 12 inches above grade, to protect CRLFs. Cleared vegetation would be removed from the reservoir bed immediately, and taken to an off-site location. After hand clearing is completed, the monitoring biologist would resurvey the reservoir bed to determine if any CRLFs or tadpoles remain within the reservoir sediment bed. After ten days pass in which no further CRLFs or tadpoles, Coast Range newt larvae, or western pond turtle juveniles or hatchlings are found in aquatic habitat in the reservoir bed, machine operations including mechanical vegetation removal and sediment excavation would be allowed to commence in the reservoir bed. Grubbing and mechanical stump removal would be performed only after hand clearance is completed and after the monitoring biologist has confirmed that the reservoir sediment bed is free of CRLFs and tadpoles.

After all vegetation is removed, the monitoring biologist would re-survey the reservoir sediment bed a final time to ascertain that CRLF, Coast Range newt larvae, and western pond turtle juveniles and hatchlings are absent from the site. Sediment excavation to the desired level, including all removal, grading and reshaping of the sediment bed, would then commence. If sediment excavation is not accomplished within one season, these procedures would be repeated at the initiation of each construction season to relocate sensitive species that may have re-colonized the reservoir bed.

While it is difficult to determine whether the loss of CRLFs and other species that are not rescued or that are injured or die during the rescue and relocation operations is significant, these losses along with the temporary loss of habitat for the red-legged frog cannot be fully mitigated and would be significant in the short-term. However, the CRLF Program, which is discussed in mitigation for Issue WI-3 (Cofferdam Construction and Plunge Pool Dewatering) would restore additional sites as mitigation habitat for CRLFs and other species. This mitigation would improve habitat and provide a long-term beneficial impact.

Issue WI-12: Sediment Transport and Disposal

Adverse effects to special-status species
Determination: ***less than significant with mitigation, long-term***

IMPACT

The proposed sediment disposal site (4R) may include habitat for some of the special-status wildlife species discussed above. Deposition of large volumes of sediment at this site could destroy habitat and may also injure or kill special-status wildlife species. Species most likely to be affected include coast horned lizard, Monterey dusky footed

wood rat, and perhaps California tiger salamander or Coast Range newt. Installation and operation of the conveyor system from the Carmel River canyon to Site 4R may result in substantial habitat loss for special-status wildlife species, including oak woodland. Because these sites include oak woodland, this is a potentially significant long-term impact.

MITIGATION

The mitigation would be the same as WI-9 (Pre-Existing Access Road Improvements)

These mitigation measures would reduce the impact to a less than significant, short-term impact.

Alternative 2 (Dam Removal)

The Project Area for Alternative 2 encompasses vegetation and other terrestrial biological resources along the existing San Clemente Road, along existing access roads requiring minor improvements, at the Dam itself, at the sediment disposal site, along the conveyor route to the sediment disposal site, and those resources currently occupying the sediment that would be excavated. The acreage of vegetation by cover type that would be lost as a result of Alternative 2 is provided in Table 4.5-1. The total acreage of vegetation that would be lost is 61.4 acres. The abutment work and fish ladder described for the Proponent's Proposed Project would not be included, as the Dam and the fish ladder would be removed, but improvements to the existing Jeep Trail extending from the Cachagua Road to the sediment disposal site would be required for this alternative, as well as Alternatives 1 and 3.

Mitigation measures for Issues VE-1 (Special-Status Plant Species), VE-2 (Loss of Protected Oak Woodland), VE-3 (Loss of Other Native Vegetation), VE-4 (Indirect Effects on Native Vegetation) would be the same as the Proponent's Proposed Project; however, the mitigation required for Alternative 2 under VE-2 is greater than the mitigation required for the Proponent's Proposed Project because the acreage of vegetation affected would be greater.

Impacts and mitigation for issues WI-3 (Cofferdam Construction and Plunge Pool Dewatering), and WI-4 (Notching Old Carmel River Dam) would be the same as the Proponent's Proposed Project. Mitigation for Issue WI-8 (Vegetation Removal and Construction-Related Disturbance) would be the same as the Proponent's Proposed Project.

Impacts and mitigation for Issues WI-2 (Removal of Ancillary Facilities), WI-9 (Pre-Existing Access Road Improvements), WI-11 (Sediment Removal), and WI-12 (Sediment Transport and Disposal) would be the same as described for Alternative 1. Mitigation for Issue WI-10 (Reservoir Drawdown or Elimination with Sediment Removal, would be the same as described for Alternative 1.

Wildlife Issues WI-1 (Dam Strengthening), WI-5 (Concrete Batch Plant Construction and Operation), WI-6 (Tularcitos Access Road Improvements); WI-7 (Reservoir Drawdown Without Sediment Removal), and WI-13 (Bypass Channel Excavation) would not occur under Alternative 2.

Issue VE-1: Special-Status Plant Species

Effects on virgate eriastrum or Lewis's clarkia populations
Determination: ***less than significant, less than significant with mitigation, short-term***

IMPACT

Populations of Lewis's clarkia were found along the existing access road from Cachagua Road and at the sediment disposal site. Improvements made to this road for construction access could result in additional impacts to this species. However, Lewis's clarkia is on List 4 of the CNPS Inventory, and does not fall under specific state or federal regulatory authority.

MITIGATION

Mitigation for impacts resulting from Issue VE-1 would be the same as the Proponent's Proposed Project.

Issue VE-2: Loss of Protected Oak Woodland

Loss of oak woodlands
Determination: ***less than significant with mitigation, long-term***

IMPACT

Construction activities could result in loss of 26.3 acres of oak woodlands protected by the Monterey County Oak Protection Ordinance in the area mapped in 2005. Improvements to access routes may also result in oak losses. Most of the loss of oak woodland would occur at the sediment disposal site and the conveyor route to this site.

MITIGATION

Mitigation measures for impacts resulting from Issue VE-2 would be the same as the Proponent's Proposed Project, but would be more extensive because the total impacted acreage would be greater.

Issue VE-3: Loss of Other Native Vegetation

Loss of native vegetation
Determination: ***less than significant with mitigation, long-term***

IMPACT

Project activities are expected to result in loss of native vegetation, including several types of sensitive riparian habitat and oak woodland habitat.

The acreage of vegetation cover type that would be lost as a result of Alternative 2 implementation is provided in Table 4.5-1. The total acreage of vegetation that would be lost in the area mapped in 2005 is 61.4 acres. The impact characterization would be the same as described for Impact VE-3 (*Loss of Other Native Vegetation*) under the Proponent's Proposed Project. It would be a less than significant impact.

MITIGATION

Mitigation measures for impacts resulting from Issue VE-3 would be the same as the Proponent's Proposed Project, but would be more extensive because the total impacted acreage would be greater.

Issue VE-4: Indirect Effects on Native Vegetation

Effects caused by increased erosion and sedimentation
Determination: ***less than significant with mitigation, short-term***

IMPACT

Project activities may result in indirect adverse impacts to vegetation, including increased erosion and sedimentation, damage to roots of oaks and other tree species adjacent to areas where heavy equipment would be operated, dust impacts to roadside vegetation, and colonization of exposed substrate by exotic plant species. This would be a significant, mitigable impact.

MITIGATION

Mitigation for impacts resulting from Issue VE-4 would be the same as the Proponent's Proposed Project.

Issue WI-8: Vegetation Removal and Construction-Related Disturbance

Effects on Special-Status Bird Species and Others Protected by the Migratory Bird Treaty Act or Raptor Protections.
Determination: ***less than significant with mitigation, short-term***

IMPACT

Potential impacts to special-status birds from vegetation removal and other construction activities include potential disturbance to breeding individuals during the nesting season would be similar to those for the Proponent's Proposed Project and Alternative 1, but a greater extent of vegetation and potential habitat for breeding birds would be affected during the construction phase.

MITIGATION

Proponent's Proposed Project Mitigation Measure WI-8 (*Vegetation Removal and Construction-Related Disturbance*) would be implemented.

Alternative 3 (Carmel River Reroute and Dam Removal)

Mitigation measures for Vegetation and Wildlife issues VE-1 (Special-Status Plant Species), VE-2 (Loss of Protected Oak Woodland), VE-3 (Loss of Other Native Vegetation), and VE-4 (Indirect Effects on Native Vegetation) would be the same as the Proponent's Proposed Project. However, fewer acres of oak woodland would be impacted.

Impacts and mitigation for WI-3 (Cofferdam Construction and Plunge Pool Dewatering), and WI-4 (Notching Old Carmel River Dam) would be the same as the Proponent's Proposed Project.

Wildlife Issues WI-1 (Dam Strengthening), WI-5 (Concrete Batch Plant Construction and Operation), WI-6 (Tularcitos Access Road Improvements), WI-7 (Reservoir Drawdown or Elimination), and WI-12 (Sediment Transport and Disposal) would not occur under Alternative 3. Impacts and mitigation for WI-2 (Removal of Ancillary Facilities), WI-9 (Pre-Existing Access Road Improvements) except for any impacts caused by road improvements from the Jeep Trail to the sediment disposal site, WI-10, (Reservoir Drawdown or Elimination with Sediment Removal), and WI-11 (Sediment Removal) would be the same as described for Alternative 1.

The Project Area for Alternative 3 encompasses vegetation and other terrestrial biological resources along the existing San Clemente Road, along existing access roads requiring minor improvements, at the Dam itself, along the Cachagua Access Route to the reservoir, and those resources currently occupying the area of the bypass channel and the diversion dike, as well as the areas that would be excavated or dewatered. The abutment work and fish ladder described for the Proponent's Proposed Project would not be included, because the Dam and the fish ladder would be removed, but improvements to extend access from the Cachagua Road to the reservoir would be required for this alternative, as well as Alternatives 1 and 2.

Potential impacts to terrestrial botanical resources from Alternative 3 are similar to those described for the Proponent's Proposed Project, with the additional loss of vegetation at the diversion channel site. However, substantially less coast live oak woodland would be affected than Alternative 1 or 2, because neither the new Tularcitos Access Route nor the sediment disposal site would be included in Alternative 3.

Impact VE-1: Special-Status Plant Species

Effects on virgate eriastrum population
Determination: ***less than significant with mitigation, short-term***

IMPACT

Populations of Lewis's clarkia were found along the existing access road from Cachagua Road and at the sediment disposal site. Improvements made to this road for construction access could result in additional impacts to this species. However, Lewis's

clarkia is on List 4 of the CNPS Inventory, and does not fall under specific state or federal regulatory authority.

MITIGATION

Mitigation for impacts resulting from Issue VE-1 would be the same as the Proponent's Proposed Project.

Issue VE-2: Loss of Protected Oak Woodland

Loss of oak woodlands

*Determination**: less than significant with mitigation, long-term***

IMPACT

Construction activities could result in loss of 9.6 acres of oak woodlands protected by the Monterey County Oak Protection Ordinance. Improvements to other access routes may also result in oak losses. Most of the loss of oak woodland would occur at the new access route from the Jeep Trail to the construction site.

MITIGATION

Mitigation for impacts resulting from Issue VE-2 would be the same as the Proponent's Proposed Project, but would be more extensive because the total acreage would be greater.

Issue VE-3: Loss of Other Native Vegetation

Loss of native vegetation
*Determination: **less than significant with mitigation, long-term***

IMPACT

Project activities are expected to result in loss of native vegetation, including several types of sensitive riparian habitat and oak woodland habitat. This would be a significant, mitigable impact.

The acreage of vegetation cover type that would be lost as a result of Project implementation is provided in Table 4.5-1. The total acreage of vegetation that would be lost is 44.7 acres. The impact characterization would be the same as described for Impact VE-3 (*Loss of Other Native Vegetation*) under the Proponent's Proposed Project. It would be a less than significant impact.

MITIGATION

Mitigation for impacts resulting from Issue VE-3 would be the same as the Proponent's Proposed Project, but would be more extensive because the total acreage would be greater.

Issue VE-4: Indirect Effects on Native Vegetation

Effects caused by increased erosion and sedimentation
Determination: ***less than significant with mitigation, short-term***

IMPACT

Project activities may result in indirect adverse impacts to vegetation, including increased erosion and sedimentation, of oaks and other tree species adjacent to areas where heavy equipment would be operated, dust impacts to roadside vegetation, and colonization of exposed substrate by exotic plant species.

MITIGATION

Mitigation measures for impacts resulting from Issue VE-4 would be the same as the Proponent's Proposed Project.

Issue WI-8: Vegetation Removal and Construction-Related Disturbance

Effects on special-status bird species and others protected by the Migratory Bird Treaty Act or Raptor Protections.
Determination: ***less than significant with mitigation, short-term***

IMPACT

Potential impacts to special-status birds from vegetation removal and other construction activities include potential disturbance to breeding individuals during the nesting season would be similar to those for Alternative 1, but less oak woodland would be affected. These disturbances to habitat would be less than those for Alternative 2.

MITIGATION

Proponent's Proposed Project Mitigation Measure WI-8 (*Vegetation Removal and Construction-Related Disturbance*) would be implemented.

Issue WI-13: Bypass Channel Excavation

Loss of habitat for special-status species
Determination: ***significant, unavoidable, long-term***

IMPACT

Brushland and riparian habitat clearing and channel excavation would remove some habitat for aquatic species including the CRLF, Coast Range newt and the western pond turtle. In addition, these activities may also affect other special-status terrestrial wildlife species, particularly the Monterey dusky-footed wood rat.

This alternative would reduce the amount of lucustrine habitat in the Project Area which may reduce the amount of bullfrog habitat which, in turn, may benefit the CRLF population.

MITIGATION

A CRLF adult and tadpole and western pond turtle juvenile and hatchling relocation program would be conducted to clear the sediment bed of these species prior to vegetation removal, sediment redistribution, channel excavation, and roadway construction. Presence of terrestrial special-status species would be assessed by preconstruction surveys and flagging of special-status species habitat for avoidance. The details of the CRLF relocation program and habitat enhancement are discussed in the mitigation measures for the Proponent's Proposed Project Issue WI-3 (Cofferdam Construction and Plunge Pool Dewatering) and in the Protection Measures (Appendix V).

Individuals of listed species not discovered during the rescue and relocation effort could be desiccated. More details are provided in the Protection Measures for Special-status Species (Appendix V).

Alternative 4 (No Project)

No improvements would be made to the roads and the Dam would remain in its current condition. There would be no construction impacts associated with this alternative.

Under this alternative, the reservoir would eventually reach a point where sediment is no longer captured by the Dam. Resulting changes in sediment effects would be most prominent in the reservoir and in the reaches immediately downstream of the SCD.

4.6 WETLANDS

This section describes the potential impacts of the San Clemente Seismic Safety Project on the wetland resources of the Project Area. Wetland resources include all wetland vegetation, non jurisdictional areas with wetland vegetation and Other Waters of the U.S. influenced by the project. Riparian vegetation is discussed in Section 4.5. Additional information is provided in this Final EIR/EIS which clarifies and amplifies the information included in this EIR/EIS. This environmental setting section was prepared using information developed from the documents provided by the Recirculated Draft Environmental Impact Report (Denise Duffy & Associates 2000), which in turn was originally developed for the New San Clemente Project (MPWMD 1984). Wetlands delineations for the Proponent's Proposed Project were conducted by Wetland Research Associates, Inc. in 1994 and Olberding and Associates in 1998 (Denise Duffy & Associates 2000). ENTRIX scientists re-delineated the wetlands in July and August 2005 and February 2006 for the Proponent's Proposed Project and the alternatives under consideration. This Final EIR/EIS contains the 2005 wetland delineation report in Appendix W.

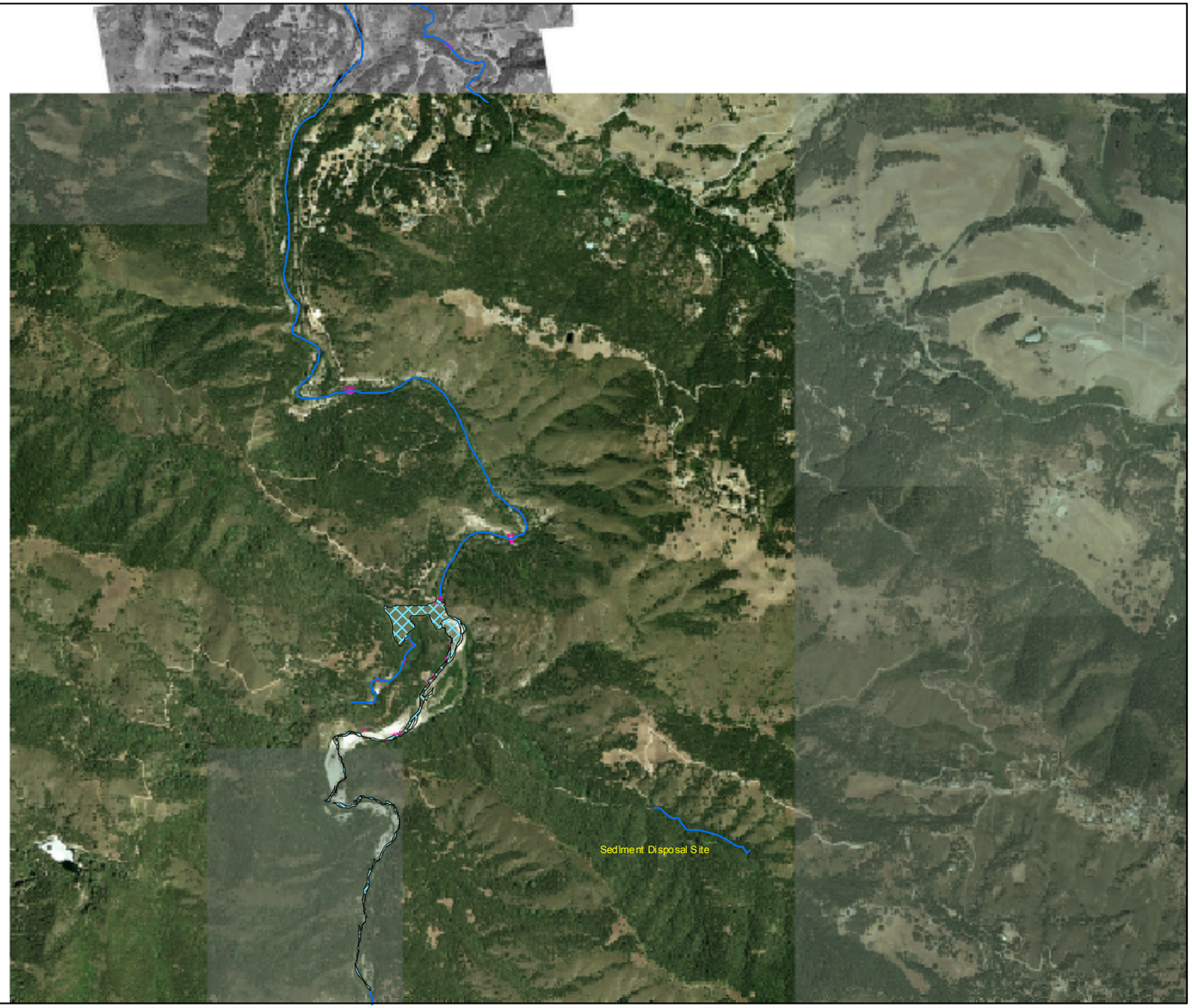
2030 Baseline Conditions

As described in Section 4.2, the natural sediment transport into the reservoir is estimated to average 16.5 AF/year (MEI 2003). At this rate, the reservoir would reach capacity in approximately 6 to 10 years and begin to pass this sediment load downstream.

In the San Clemente Reservoir sediment plain (Reach 3), a gentle incision of the meandering planform into the coarse sands would allow for the development of young riparian communities. Much of the San Clemente arm and the much larger Carmel River arm of the sediment plain already have fairly extensive areas of localized riparian vegetation, including sedge meadow, isolated seasonal and perennial ponds, and emergent riparian wetland vegetation. Larger floods, such as the 1998 flood, would continue to scour large portions of the young riparian growth, maintaining a dynamic sediment plain. However, as deposition of coarse sediment and large woody debris helps to stabilize the terraces and channel patterns develop into more incised meanders, an increased number of large patches of more mature riparian woodland and forest habitat would develop (Denise Duffy & Associates 2000).

Reach 4 (downstream of SCD) has hard banks and the upper portion of Reach 5 has relatively hard banks and moderate gradients that could experience sediment accumulation on bars, benches, and low overflow channels as the reservoir fills and begins to pass sediment downstream. Figure 4.6-1 included in this report identifies the River Reaches that would be affected by the Proponent's Proposed Project and its alternatives. These lower fluvial landforms are supporting different but relatively even-aged stands of riparian vegetation. These vary from small complexes of cottonwood-sycamore-willow-alder on the older deposits, to even-aged stands of alder and willow, to young herbaceous growth on the youngest bars.

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Legend

- Stream
- Wetland Delineation Sites
- Reservoir and Carmel River

Projection: NAD83
Datum: Lambert Conformal Conical

N

0 0.25 0.5 1 1.5 2 Miles

Figure 4.6-1
Wetlands and Other Waters of the U.S. in the Project Area

ENTRIX

Large episodic floods and deposits of sand could scour, bury, and kill recently-established riparian and brushy habitats near water. Since these reaches have hard banks and a steeper gradient, they are less subject to bank failure and loss of mature riparian vegetation, even in smaller episodic events (Denise Duffy & Associates 2000).

Softer banks occur in the lower portion of Reach 5 in the Robles del Rio area and increasingly downstream through reaches 6 and 7 and the upper portion of Reach 8. In areas with softer banks, the river channel would become wider and shallower. Deposition and low flow channel migration is likely to smother or remove young herbaceous and riparian scrub communities on the less stable bars, benches and terraces (Denise Duffy & Associates 2000).

Extensive areas of bare sandy flood plain and braided channels would be created when episodic events deposit large to very large amounts of material, especially if they occur early in the 50-year project life. A complex depositional and erosional pattern with blowouts, terrace scour holes, and trapping of large woody debris could lead to a complex of riparian and wetland habitats of different ages (Denise Duffy & Associates 2000).

Reach 8 (especially the lower two thirds) and the upper portion of Reach 9 have finer grained alluvial soils, with more extensive riparian forest and root stabilized banks. These conditions are combined in numerous locations with hardened banks and a relatively straight and narrow river channel with good conveyance. Therefore, there is less likely to be significant bank migration and loss of riparian vegetation in this reach. Substantial filling of the active channel would bury or create habitat favorable for growth of a successional complex of riparian habitats. This reach has only very localized opportunities for creation of smaller, more isolated and discontinuous bars and benches for seral herbaceous, shrub, willow scrub and woodland succession (Denise Duffy & Associates 2000).

The complex of riparian, wetland, and coastal dune habitats associated with the lagoon and the associated riparian forest above the lagoon is not expected to change appreciably due to release of sediment over SCD. The dynamics of this area are controlled by other factors (Denise Duffy & Associates 2000).

4.6.1 ENVIRONMENTAL SETTING

Locations with potential jurisdictional wetlands and Other Waters of the U.S. in the Project Area for the Proponent's Proposed Project and alternatives include Tularcitos Creek at the new Tularcitos Access Road crossing, the concrete ford on an existing access road, the Old Carmel Dam Bridge (OCDB), the existing plunge pool access road along the east side of the Carmel River (which requires improvements), the plunge pool at the SCD, and the reservoir flood plain upstream of the SCD.

Olberding and Associates conducted a separate field survey of the CVFP settling basins in 1997 (Denise Duffy & Associates 2000). The USACE concurred with this study in

determining that the settling basins are not considered to be jurisdictional wetlands or Waters of the U.S. because they are artificial settling basins constructed on dry land for the purpose of collection and detention of piped sediment-laden water from the CVFP (Denise Duffy & Associates 2000). CVFP activities are ongoing, the source of hydrology in the settling basins is artificial and, under normal circumstances, wetland vegetation would not be present.

Wetlands in the Project Area for the Proponent's Proposed Project and alternatives consist primarily of riparian vegetation associated with the Carmel River, Tularcitos Creek, and the flood plain of the reservoir along the Carmel River and San Clemente Creek. This riparian vegetation would be classified as palustrine forested wetlands in the Cowardin system where the trees are taller than 20 feet, or as palustrine or lacustrine shrub-scrub wetlands where the woody vegetation is less than 20 feet tall (Cowardin 1979). Functions provided by these riparian wetlands include temporary surface water storage, energy dissipation, nutrient cycling, removal of non-point source pollutants, retention of particulates, organic carbon export, and maintenance of plant and animal communities (Brinson et al. 1995).

Where only herbaceous vegetation is present, the Cowardin classification would be palustrine emergent wetlands ranging from permanently flooded to seasonally flooded. Functions provided by these riparian wetlands include temporary surface water storage, energy dissipation, nutrient cycling, removal of non-point source pollutants, retention of particulates, organic carbon export, and maintenance of plant and animal communities (Brinson et al. 1995).

Other Waters of the U.S. in the Project Area include these streams, and the lower reservoir shoreline of San Clemente Reservoir.

Within the SCD study area, potential jurisdictional wetlands, under current conditions, are found adjacent to San Clemente Reservoir and the base of the SCD, the Carmel River, and Tularcitos Creek, as shown on Figure 4.6-1.

ENTRIX has made a preliminary determination that approximately 0.9 acres of jurisdictional wetlands are present at these sites with another 18.5 acres meeting the definition of "Other Waters of the U.S." under Section 404 of the Clean Water Act (CWA). The majority of this acreage occurs within the San Clemente Reservoir. This acreage does not include the fringe wetlands between the Carmel River and the access road, as the improvements to the road are not expected to affect these wetlands. These wetlands are generally in good condition.

4.6.2 ENVIRONMENTAL RESOURCE IMPACT STANDARDS AND METHODS

Standards of Significance

The significance criteria for evaluating wetlands impacts resulting from the Proponent's Proposed Project are based on the following considerations. In accordance with CEQA Mandatory Findings of Significance, and agency and professional standards, an adverse impact on wetlands would be significant and would require mitigation if project construction or operations activities would:

- Fill or alter a wetland or vernal pool, resulting in a long-term change in its hydrology or soils, or the composition of vegetation of a unique, rare, or special concern wetland community;
- Substantially affect a rare or endangered species of animal or plant or the habitat of the species;
- Remove or significantly prune overstory tree species in a manner that would affect wetland functions related to bank stabilization, stream temperature, or insect habitat;
- Cause short- or long-term violations of federal or state water quality standards for streams that lead to wetlands, measured as in-stream elevated turbidity readings or decreased DO levels; or
- Cause substantial flooding, erosion or siltation

Impact Assessment Methodology

This assessment evaluates and identifies impacts over a range of temporal scales. The three temporal impact categories are:

- Short-term impacts that occur within the construction period, but do last throughout the period;
- Short-term impacts that occur within the construction period (concurrent with the number of construction seasons, which vary from one alternative to another);
- Long-term impacts that persist beyond the construction period.

Existing resource information and the results of new field studies in 2005 were used to develop the description of the environmental setting. The resources described in that section were evaluated in conjunction with the activities associated with the Proponent's Proposed Project and the alternatives to determine potential impacts and develop mitigation measures.

The following impact issues have been defined for Wetland resources:

- WET-1: Permanent Loss of Wetlands and Other Waters of the U.S. (permanent loss of jurisdictional waters of the U.S.)
- WET-2: Short-term Disturbance of Wetlands and Other Waters of the U.S. (short-term filling of fringe wetlands)
- WET-3: Indirect Impacts to Wetlands and Other Waters of the U.S. (indirect adverse impacts to vegetation, including increased erosion and sedimentation).

The acreages presented in the following discussion are estimates derived from preliminary engineering drawings (Table 4.6-1).

Table 4.6-1: Area of Waters of the U.S. and Potential Jurisdictional Wetlands Impacted by Proponent's Proposed Project and Alternatives

	Other Waters of the U.S. (acres)	Potential Jurisdictional Wetlands (acres)	Other Waters of the U.S. (acres)	Potential Jurisdictional Wetlands (acres)
	Permanent		Short-term	
Proponent's Proposed Project	0.02	--	7.3	0.43
Alternative 1	0.12	--	7.9	0.74
Alternative 2	0.12	--	11.5	0.92
Alternative 3	10.0	--	0.5	0.28
Alternative 4	No direct impacts			

4.6.3 IMPACTS AND MITIGATION

Proponent's Proposed Project (Dam Thickening)

Locations with potential jurisdictional wetlands in the Project Area for the Proponent's Proposed Project include the concrete ford on an existing access road, the OCDB, the existing access road along the east side of the Carmel River (which requires improvements), the plunge pool at SCD, and the reservoir flood plain upstream of the SCD. The majority of this acreage occurs within the San Clemente Reservoir.

Issue WET-1: Permanent Loss of Wetlands and Other Waters of the U.S.

Permanent loss of jurisdictional waters of the U.S.
Determination: ***less than significant with mitigation, long-term***

IMPACT

Construction activities associated with the Proponent's Proposed Project would result in the thickening of the Dam by nine feet at the plunge pool and the permanent loss of a small area of jurisdictional Other Waters of the U.S. (Table 4.6-1). Improvements to the

OCRD Bridge and concrete ford would result in no permanent loss of wetlands or Other Waters of the U.S.

MITIGATION

See Appendix U for a Botanical Management Plan which includes provisions for restoration, mitigation, and monitoring for wetlands and Other Waters affected by the project. Riparian and fringe palustrine emergent wetlands similar in function (streamside habitat) to the lost acreage would be created or restored at a 3:1 ratio, grading as necessary and placing cuttings or seedlings in appropriate habitat under the supervision of a qualified botanist. Seedlings would be from Carmel Valley area populations. Replacement plantings would be monitored for at least five years. Seedlings would be replanted as necessary to ensure long-term survival. Restoration sites would be monitored for five years. The USACE, and CDFG would have regulatory authority over the measures in the Botanical Management Plan, but performance criteria will include cover criteria for native vegetation (ranging from 50 to 75 percent) and survival criteria for woody vegetation that is planted. Additional mitigations details are provided in the Botanical Resources Management Plan (Appendix U).

For impacts to Other Waters, mitigation may consist of stream channel improvements either along the Carmel River upstream from the Project Area or along other streams in the watershed. The project proponent may either conduct the work or provide funding to other property managers for projects that restore natural channel conditions.

Restoration may be conducted at sites in lands along the Carmel River owned by the Project Proponent or on appropriate streams elsewhere in the watershed. Restoration sites would be coordinated with the USACE and CDFG and would be conserved in perpetuity.

Issue WET-2: Short-term Disturbance of Wetlands and Other Waters of the U.S.

Short-term filling of fringe wetlands
*Determination**: Less than significant with mitigation, short-term***

IMPACT

Construction activities associated with the Proponent's Proposed Project would result in the temporary filling or dewatering of a small area of fringe palustrine emergent wetlands and several acres of Other Waters of the U.S. (Table 4.6-1).

Construction activities associated with the Proponent's Proposed Project would have no effect on wetlands above the Dam and minimal temporal effect on Other Waters of the U.S. due to draining the reservoir pool and temporary placement of a cofferdam and diversion pipeline during Phase II. Below the Dam, temporary fill would be placed in the plunge pool and at the upper end of the plunge pool access road. Two temporary

cofferdams would also be placed in the Carmel River to prevent back flow and create a stilling basin between the cofferdams.

Improvements to the Old Carmel River Dam Bridge and concrete ford should result in no permanent loss of wetlands or Other Waters of the U.S. The Old Carmel River Dam Bridge can be reached from the south end without affecting fringe wetlands. Temporary caissons would constitute a minor temporary fill, and the new upstream piers would occupy approximately the same footprint as the existing piers. The concrete ford for the "high road" would probably require minor fill on top of existing soft fill on the south side of the crossing to provide a firm base.

MITIGATION

Mitigation for Impact Issue WET-1 (Permanent Loss of Wetlands and Other Waters of the U.S.*)* would be implemented. In addition, cofferdams would be constructed of clean river-run gravel. They would be installed no earlier than May and removed in October. (If existing flows are less than the 50 cfs bypass capacity, the cofferdams could be installed as early as April 15th or removed as late as November 30th).

The plunge pool staging area would be filled with gravel (spawning size) and topped with a visqueen liner and a layer of crushed rock and/or sand to create a working surface. When construction is complete, the surface layer and liner would be removed off-site and the gravels used to augment spawning habitat in the plunge pool tailwater and downstream.

The plunge pool access road would be upgraded to a one lane, two-way road with pullouts to minimize road widening and loss of wetlands and riparian vegetation. Any willows, alders, cottonwoods or sycamores removed by temporary filling of the plunge pool and access road would be replaced at a 3:1 ratio by placing cuttings or seedlings in appropriate habitat under the supervision of a qualified botanist. Seedlings would be from Carmel Valley area populations. Replacement plantings would be monitored for at least five years. Seedlings would be replanted as necessary to ensure long-term survival (see mitigation for Impact Issue VE-3 (Loss of other Native Vegetation) in Section 4.5). Additional mitigation details are located in the Botanical Resources Management Plan (Appendix U)

Issue WET-3: Indirect Impacts to Wetlands and Other Waters of the U.S.

Indirect adverse impacts to vegetation, including increased erosion and sedimentation
*Determination****: less than significant with mitigation, short-term***

IMPACT

Construction activities associated with the Proponent's Proposed Project could have indirect impacts on wetlands and Other Waters of the U.S. if these activities result in accelerated erosion and sedimentation. Potential erosion and sedimentation impacts

are described in detail in Section 4.5, (Impact Issue VE-4, Indirect Effects on Native Vegetation) Proponent's Proposed Project.

MITIGATION

Implementing mitigation measures for Impact Issue VE-4 would reduce Impact Issue WET-3 to less than significant. BMPs for erosion control are located in the Stormwater Pollutions and Prevention Plan and the Botanical Resources Management Plan (Appendices K and U, respectively).

Alternative 1 (Dam Notching)

Locations with potential jurisdictional wetlands in the Project Area for Alternative 1 include the concrete ford on an existing access road, the OCDB, the existing access road along the east side of the Carmel River (which requires improvements), the plunge pool at SCD, the reservoir flood plain upstream of SCD, and the sediment disposal site. ENTRIX has made a preliminary determination that approximately 0.7 acre of wetlands are present at these sites with another 8.0 acres meeting the definition of "Other Waters of the U.S." under Section 404 of the CWA. The majority of this acreage occurs within the San Clemente Reservoir.

Impact Issue WET-3 (Indirect Impacts to Wetlands and Other Waters of the U.S.) would be the same as described for the Proponent's Proposed Project.

Issue WET-1: Permanent Loss of Wetlands and Other Waters of the U.S.

Permanent loss of Other Waters of the U.S.
Determination: ***less than significant with mitigation, long-term***

IMPACT

Potential impacts to wetland resources from Alternative 1 are similar to those described for the Proponent's Proposed Project WET-1 (Permanent Loss of Wetlands and Other Waters of the U.S.*),* except that construction activities associated with this alternative would result in the permanent loss of Other Waters of the U.S. due to fill at the sediment disposal site (Table 4.6-1).

MITIGATION

Mitigation measures for Impact Issue WET-1 would be the same as described for the Proponent's Proposed Project. The restoration or conservation acreages would be adjusted to suit the affected acreage.

Issue WET-2: Short-term Disturbance of Wetlands and Other Waters of the U.S.

Short-term loss of fringe wetlands and Other Waters of the U.S.
Determination: ***Less than significant with mitigation, short-term***

IMPACT

Potential impacts to wetland resources from Alternative 1 are similar to those for the Proponent's Proposed Project WET-2 (Short-term Disturbance of Wetlands and Other Waters of the U.S.), except that construction activities associated with this alternative would result in the temporary loss of fringe wetlands and Other Waters of the U.S. (Table 4.6-1).

Construction activities associated with Alternative 1 would affect wetlands and Other Waters of the U.S. above the Dam due to sediment removal. Below the Dam, temporary fill would be placed in the plunge pool and at the upper end of the plunge pool access road, affecting limited areas of Other Waters of the U.S. and fringe wetlands. A temporary cofferdam would also be placed in the Carmel River to divert the flow into a pipeline. A similar cofferdam may be placed in San Clemente Creek.

MITIGATION

Mitigation Measures WET-1 and WET-2 would be implemented as described for the Proponent's Proposed Project. The restoration or conservation acreages would be adjusted to suit the affected acreage.

Issue WET-3: Indirect Impacts to Wetlands and *Other* Waters of the U.S.

Indirect adverse impacts to vegetation, including increased erosion and sedimentation
Determination: ***less than significant with mitigation, short-term***

IMPACT

Construction activities associated with Alternative 1 could have indirect impacts on wetlands and Other Waters of the U.S. if these activities result in accelerated erosion and sedimentation. Potential erosion and sedimentation impacts are described in detail in Section 4.5, (Issue VE-4, Indirect Effects on Native Vegetation) Proponent's Proposed Project.

MITIGATION

Implementing mitigation measures applying to Impact Issue VE-4 would reduce Impact WET-3 to less than significant.

Alternative 2 (Dam Removal)

Within the Project Area of Alternative 2, potential jurisdictional wetlands, under current conditions, are found adjacent to San Clemente Reservoir and the base of the SCD (including the plunge pool), and the Carmel River as shown on Figure 4.6-1. Potential Other Waters of the U.S. include these streams, an unnamed tributary to the Carmel River that forms part of the sediment disposal site, and the reservoir pool upstream of the SCD. The majority of this acreage occurs within the San Clemente Reservoir.

Issue WET-1: Permanent Loss of Wetlands and Other Waters of the U.S.

Permanent loss of Other Waters of the U.S.
Determination: ***less than significant with mitigation, long-term***

IMPACT

Potential impacts to wetland resources from Alternative 2 are similar to those described for the Proponent's Proposed Project WET-1 (Permanent Loss of Wetlands and Other Waters of the U.S.), except that construction activities associated with this alternative would result in the permanent loss of Other Waters of the U.S. due to fill at the sediment disposal site (Table 4.6-1).

MITIGATION

Mitigation measures applying to Impact Issue for the Proponent's Proposed Project would be implemented. The restoration or conservation acreages would be adjusted to suit the affected acreage.

Issue WET-2: Short-term Disturbance of Wetlands and Other Waters of the U.S.

Short-term filling of fringe wetlands
Determination: ***Less than significant with mitigation, short-term***

IMPACT

Potential impacts to wetland resources from Alternative 2 are similar to those described for Alternative 1, but include short-term impacts to additional wetlands and Other Waters of the U.S. upstream of the disturbance limits of Alternative 1 (Table 4.6-1).

MITIGATION

Mitigation measures applying to Impact Issues WET-1 (Permanent Loss of Wetlands and Other Waters of the U.S.) and WET-2 under the Proponent's Proposed Project would be implemented. The restoration or conservation acreages would be adjusted to suit the affected acreage.

Issue WET-3: Indirect Impacts to Wetlands and Other Waters of the U.S.

Indirect adverse impacts to vegetation, including increased erosion and sedimentation
Determination: ***less than significant with mitigation, short-term***

IMPACT

Potential impacts to wetland resources from Alternative 2 are similar to those described for the Proponent's Proposed Project, but include impacts to Other Waters in the unnamed tributary that is part of the sediment disposal site.

MITIGATION

Implementing mitigation measures applying to Impact Issue VE-4 would reduce Impact WET-3 to less than significant.

Alternative 3 (Carmel River Reroute and Dam Removal)

Locations with potential jurisdictional wetlands and Other Waters of the U.S. in the Project Area for Alternative 3 include the concrete ford on an existing access road, the OCDB, the existing access road along the east side of the Carmel River (which requires improvements), the reservoir flood plain upstream of SCD and access route and the conveyor route for the sediment disposal site (which form the primary access route for this alternative).

Within the Alternative 3 Project Area, potential jurisdictional wetlands, under current conditions, are found adjacent to San Clemente Reservoir and the base of the SCD, the Carmel River, and San Clemente Creek, as shown on Figure 4.6-1. Potential Other Waters of the U.S. include these streams and the reservoir pool upstream of the SCD. The majority of this acreage occurs within the San Clemente Reservoir.

Issue WET-1: Permanent Loss of Wetlands and Other Waters of the U.S.

Permanent loss of jurisdictional waters of the U.S.
Determination: ***less than significant with mitigation, long-term***

IMPACT

Potential impacts to wetland resources from Alternative 3 are similar to those for the Proponent's Proposed Project WET-1, although construction activities associated with Alternative 3 would result in the permanent loss of several acres of Other Waters of the U.S. due to the installation of the diversion dam and the elimination of San Clemente reservoir by the removal of SCD (Table 4.6-1).

MITIGATION

Mitigation measures applying to Impact Issue WET-1 under the Proponent's Proposed Project would be implemented. The restoration or conservation acreages would be adjusted to suit the affected acreage.

Issue WET-2: Short-term Disturbance of Wetlands and Other Waters of the U.S.

Short-term filling of fringe wetlands
*Determination****: Less than significant mitigation, short-term***

IMPACT

Potential impacts to wetland resources from Alternative 3 are similar to those for the Proponent's Proposed Project WET-2, except that construction activities associated

with Alternative 3 would result in the short-term loss of a smaller area of fringe wetlands and Other Waters of the U.S. (Table 4.6-1) A temporary cofferdam would be placed in the Carmel River to divert the flow into a pipeline. A similar cofferdam may be placed in San Clemente Creek.

MITIGATION

Mitigation measures applying to Impact Issues WET-1 (Permanent Loss of Wetlands and other Waters of the U.S.) and WET-2 under the Proponent's Proposed Project would be implemented. The restoration or conservation acreages would be adjusted to suit the affected acreage.

Issue WET-3: Indirect Impacts to Wetlands and Other Waters of the U.S.

Indirect adverse impacts to vegetation, including increased erosion and sedimentation
Determination: ***less than significant with mitigation, short-term***

IMPACT

Potential impacts to wetland resources from Alternative 3 are similar to those for the Proponent's Proposed Project.

MITIGATION

Implementing mitigation measures applying to Impact Issue VE-4 would reduce Impact Issue WET-3 to less than significant.

Alternative 4 (No Project)

The area of potential effect for Alternative 4, the No Project Alternative, encompasses wetlands and Waters of the U.S. downstream of the Dam that may be affected when the reservoir has filled with sediment and uncontrolled sediment spills over the Dam spillway occur. No improvements would be made to the roads and the Dam would remain in its current condition.

Wetlands Issues WET-1 (Permanent Loss of Wetlands and Other Waters of the U.S.), Issue WET-2: (Short-term Disturbance of Wetlands and Other Waters of the U.S) and WET-3 (Indirect Impacts to Wetlands and Other Waters of the U.S.) do not apply to this alternative because there would be no construction activities.

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4.7 AIR QUALITY

This section describes the potential impacts of the San Clemente Seismic Safety Project and other action alternatives on the Air Quality in the Project Area. Air Quality includes ambient local and regional air quality influenced by the project. Additional information is provided in this Final EIR/EIS which clarifies and amplifies the information included in the Draft EIR/EIS. This environmental setting section was prepared using information developed from the documents provided by the RDEIR (Denise Duffy & Associates 2000). Air Quality analysis for the project was conducted using criteria, methodologies, and tools developed by the Monterey Bay Unified Air Pollution Control District (MBUAPCD), comprised of Santa Cruz, San Benito and Monterey Counties, and the United States EPA.[1] Calculation templates are included in Appendix X. Appendix Y presents a General Conformity Finding for the Proponent's Proposed Project under the General Conformity Rule adopted to comply with the federal Clean Air Act (CAA) Section 176(c).

4.7.1 ENVIRONMENTAL SETTING

Information in this section is derived from the 2004 Air Quality Management Plan (AQMP) for the Monterey Bay Region.

Climate and Meteorology

Carmel Valley is contained within the North Central Coast Air Basin (NCCAB) and thus is subject to the climate and meteorological conditions of the basin. The semi-permanent high-pressure cell in the eastern Pacific is the basic controlling factor in the climate of the air basin. In the summer, the high-pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. Air descends in the Pacific High, forming a stable temperature inversion of hot air over a cool coastal layer. In the fall the winds become weak and the marine layer grows shallow, subsiding completely at times. During the winter the Pacific high moves to the south and has less influence on the air basin. Air frequently flows in a southeasterly direction out of the Salinas and San Benito valleys. Northwest winds are nevertheless still dominant in the winter, but easterly flow is more frequent. Inversion conditions, which tend to reduce the mixing and dilution of pollutants in the valley, are present throughout a significant part of the year.

Ambient Air Quality Standards

The 1970 federal CAA, amended in 1977 and 1990, identifies six criteria, or common, pollutants regulated by EPA on the basis of health and environmental effects:

- Reactive organic compounds/gases (ROC/ROG) as ozone (O_3) precursors[2]

[1] An air quality analysis was conducted by Don Ballanti, certified consulting meteorologist, for the RDEIR on the Seismic Retrofit of SCD (DWR 2000). This analysis makes use of Ballanti's work where possible.

[2] ROC and ROG are alternate names for VOC and NMHC (i.e., nonmethane nonethane photochemically reactive hydrocarbons, C3 & up)

- Carbon monoxide (CO)
- Nitrogen oxides (NO and NO_2 as NO_X) as ozone (O_3) precursors
- Sulfur oxides (SO_2 and SO_3 as SO_X)
- Particulate matter, 10 microns or less and 2.5 microns or less (PM_{10} and $PM_{2.5}$)
- Lead (Pb)[3]

The regulated criteria pollutants and/or their derivatives (e.g., O_3) can cause significant negative health and environmental effects when ambient concentrations are high enough. The EPA and the California Air Resources Board (CARB) have established ambient air quality standards for criteria pollutants. Ambient air quality standards represent maximum allowable safe concentrations to avoid specific adverse health effects associated with each pollutant.

Federal and State of California ambient air quality standards are summarized in Table 4.7-1. These standards differ with regard to certain contaminants because they were developed separately with independent purposes and methods. Despite their differences, both sets of standards were determined with the intent of avoiding public health related effects.

Table 4.7-1: Current Federal and State Ambient Air Quality Standards[4]

Species Name	Averaging Time	California Standards		Federal Standards	
		ppmv	µ/m3	ppmv	µ/m3
Ozone (O_3)	1-hour	0.09	177	–	–
	8-hour	0.07	137	0.08	157
Carbon Monoxide (CO)	1-hour	20	22,890	35	40,057
	8-hour	9	10,300	9	10,300
	Lake Tahoe (8-hr)	6	6,867	–	–
Nitrogen Dioxide (NO_2)	1-hour	0.18	338	–	–
	Annual	0.03	56	0.053	100
Sulfur Dioxide (SO_2)	1-hour	0.25	654	–	–
	3-hour	–	–	0.50	1,308
	24-hour	0.04	105	0.14	366
	Annual	–	–	0.03	78
Particulates (as PM_{10})	24-hour	–	50	–	150
	Annual	–	20	–	–
Particulates (as $PM_{2.5}$)	24-hour	–	–	–	35
	Annual	–	12	–	15
Lead (Pb)	30-day	–	1.5	–	–
	90-day	–	–	–	1.5
Sulfates (as SO_4)	24-hour	–	25	–	–
Hydrogen Sulfide (H_2S)	1-hour	0.03	42	–	–
Vinyl Chloride	24-hour	0.01	26	–	–

ppm = parts per million
μ/m^3 = micrograms per cubic meter

[3] Lead is not applicable to this analysis since the project is not source of lead emissions
[4] CARB (2007) http://www.arb.ca.gov/research/aaqs/aaqs2.pdf

On July 18, 1997, EPA revised the ozone and particulate matter standards based on a comprehensive review of new scientific evidence. The EPA replaced the 1-hour ozone standard with an 8-hour ozone standard and supplemented the particulate matter standard with 24-hour and annual standards for fine particulate matter. Implementation of the new ozone standard was delayed until recently due to litigation. The federal one-hour standard for ozone was revoked on June 15, 2005, and replaced by the federal eight-hour ozone standard. The new federal and state standards for particulate matter 2.5 microns in diameter ($PM_{2.5}$) have been adopted as well. Ambient air quality is currently being monitored for these new standards at the Salinas and Santa Cruz air monitoring stations. These standards are in addition to existing standards for particulate matter 10 microns or less (PM_{10}).

2030 Baseline Conditions

The project site is within the NCCAB. The MBUAPCD operates a network of monitoring sites throughout the NCCAB. The four monitoring sites are located in Carmel Valley, King City, Monterey, and Salinas. An additional Salinas site has not been used since 1999. The monitoring site in Carmel Valley at Ford Road is the one in closest proximity to the project site, and monitors for ozone and PM_{10}.

One exceedence of the state ozone standard for PM_{10} was recorded at the Carmel Valley monitoring site in 1999, and two exceedences were recorded in 2001 and 2003 at the Salinas monitoring site. The 2004 AQMP states that in 2000 to 2003 the state ozone standard was exceeded on 24 station days or 17 air basin days for a total of 36 hours. The MBUAPCD meets criteria for nonattainment-transitional area. Tables 4.7-2 through 4.7-6 summarize relevant background data for ozone, PM_{10}, CO, and NO_2 [5]

Table 4.7-2: Ozone Trends Summary: Carmel Valley-Ford Road

Year	Days Exceeding Standard			Highest Concentration for O_3 (ppm)	
	1-hour State	1-hour Federal	8-hour Federal	1-hour average	8-hour average
2004	0	0	0	0.093	0.079
2003	0	0	0	0.082	0.074
2002	0	0	0	0.080	0.073
2001	0	0	0	0.085	0.079
2000	0	0	0	0.088	0.079
1999	0	0	0	0.080	0.067
1998	0	0	0	0.082	0.069
1997	0	0	0	0.080	0.072
1996	0	0	0	0.089	0.080
1995	0	0	0	0.093	0.077
1994	0	0	0	0.093	0.079

Notes: All concentrations expressed as parts per million. An exceedence is not necessarily a violation.
Source of data: CARB 2005

[5] For all tables: When State and Federal concentrations were provided, state numbers were used. In most cases, the state and federal numbers provided were the same, in some cases they differed slightly.

Table 4.7-3: Ozone Trends Summary: Salinas #3

Year	Days Exceeding Standard			Highest Concentration for O_3 (ppm)	
	1-hour State	1-hour Federal	8-hour Federal	1-hour average	8-hour average
2004	0	0	0	0.077	0.070
2003	0	0	0	0.073	0.063
2002	0	0	0	0.075	0.062
2001	0	0	0	0.076	0.069
2000	0	0	0	0.075	0.065

Notes: All concentrations expressed as parts per million. An exceedence is not necessarily a violation
Source of data: CARB

Table 4.7-4: Background Ambient PM_{10}: Carmel Valley & Salinas

Year	Salinas #3 Annual Mean for PM_{10} (µ/m3)	Carmel-Ford Annual Mean for PM_{10} (µ/m3)	Salinas #3 Highest 24-hour Concentration for PM_{10} (µ/m3)	Carmel-Ford Highest 24-hour Concentration for PM_{10} (µ/m3)
2004			41	33
2003		13	67	35
2002	18.5	14.8	46	35
2001			51	31
2000			37	28
1999				57
1998				29
1997		14.3		31
1996				24
1995		13.4		28
1994		15.3		31
Max	19	15	67	57

Notes: Concentrations corrected to 20 C (68 F)
Source of data:CARB

Table 4.7-5: Background Ambient CO: Salinas

Year	Highest 8-hour Concentration for CO (ppm)	Highest 8-hour Concentration for CO (µ/m3)
2004	1.21	1408
2003	1.09	1269
2002	1.38	1606
2001	1.64	1909
2000	1.40	1630
1999	1.79	2084
1998	2.18	2538
1997	1.79	2084
1996	2.56	2980
1995	2.13	2479
1994	2.06	2398
Max		2980

Notes: 1994 to 1999 Salinas Natividad Road #2, 1999 to 2004 Salinas #3. Concentrations corrected to 20 C (68 F)
Sources of data: CARB 2005

Table 4.7-6: Background Ambient NO_2: Salinas #3 & Salinas Natividad Road #2

Year	Annual Mean for NO_2 (ppm)	Annual Mean for NO_2 (µ/m3)	Highest Concentration for NO_2 (ppm)	Highest Concentration for NO_2 (µ/m3)
2004	0.007	13	0.139	266
2003	0.006	11	0.053	101
2002	0.007	13	0.049	94
2001	0.007	13	0.041	78
2000	0.007	13	0.071	136
1999	0.010	19	0.054	103
1998	0.010	19	0.085	163
1997	0.010	19	0.056	107
1996	0.011	21	0.060	115
1995	0.011	21	0.054	103
1994	0.012	23	0.067	128
Max		23		266

Notes: 1994 to -1999 Salinas Natividad Road #2, 1999 to 2004 Salinas #3. Concentrations corrected to 20 C (68 F)
Sources of data: CARB 2005

Table 4.7-7 shows aggregated historic and projected exceedences of the California 1-hour ozone standard (0.09 ppm) in the NCCAB for 1987 through 2030, respectively[6]. Projections for 2004 to 2030 are based on nonlinear trendline analysis of historic data from 1987 to 2003.[7] The trendline analysis shows an overall quantitative improvement in ambient air quality in the NCCAB from 1987 to 2003, with the expectation that implementation of district-wide NO_X and ROC emission control measures will continue to reduce ambient ozone levels in the future.

Air Quality Planning

The MBUAPCD shares responsibility with CARB and the EPA for ensuring that the State and National Ambient Air Quality Standards (NAAQS) are met within Monterey County. State law assigns local air districts the primary responsibility for control of air pollution from stationary sources while the State presides over control of mobile sources. The MBUAPCD is responsible for developing regulations that govern emissions of air pollution, permitting and inspecting stationary sources, and monitoring air quality and air quality planning activities.

Federally mandated air quality planning is regulated by the CAA Amendments of 1990 (CAAA). Historically, the NCCAB was classified as a moderate nonattainment area for ozone and either unclassified or attainment for all other pollutants. In 1994 the MBUAPCD submitted a redesignation request (requesting redesignation from nonattainment to attainment). As part of the redesignation process, the MBUAPCD, the Association of Monterey Bay Area Governments (AMBAG) and the San Benito County Council of Governments adopted a Maintenance Plan for the region.

[6] Rounded to nearest whole station day.
[7] Last available year of published reduced data is 2003.

Table 4.7-7: Exceedences of State Ozone Standard in NCCAB 1987 — 2030[8]

Calendar Year	Data Type	Basin-Wide Station Days	
		Lower Estimate	Upper Estimate
1987	Historic	42	42
1988	Historic	16	16
1989	Historic	12	12
1990	Historic	13	13
1991	Historic	14	14
1992	Historic	10	10
1993	Historic	17	17
1994	Historic	6	6
1995	Historic	8	8
1996	Historic	19	19
1997	Historic	1	1
1998	Historic	12	12
1999	Historic	3	3
2000	Historic	4	4
2001	Historic	3	3
2002	Historic	11	11
2003	Historic	3	3
2004	Projected	3	4
2005	Projected	3	4
2006	Projected	2	4
2007	Projected	2	4
2008	Projected	2	3
2009	Projected	2	3
2010-19	Projected	1	3
2020-30	Projected	0	2

With revocation of the federal one-hour ozone standard in 2005, the NCCAB is now designated either an attainment or unclassified area for all federal air quality standards[9] as applicable. The NCCAB is designated a nonattainment transitional area for the State one-hour ozone standard, a nonattainment area for the State PM_{10} standard, and an attainment area for the State CO standard in Monterey County.

The current attainment status of the NCCAB is listed in Table 4.7-8. The 1991 AQMP for the Monterey Bay Area was the first plan prepared in response to the California Clean Air Act of 1988 (CCAA) that established specific planning requirements to meet the ozone standard. The Act requires that the AQMP be updated every three years. The 2004 AQMP is the fourth update to the 1991 AQMP with the first three completed in 1994, 1997 and 2000, respectively. The AQMP addresses only attainment of the State ozone standard. Attainment of the PM_{10} standard is addressed in a separate report. The CCAA also requires the MBUAPCD to prepare and submit a report to CARB summarizing progress in meeting the schedules for developing, adopting or implementing the air pollution control measures contained in the MBUAPCD's plans. The report is due by December 31 of each year and is included in the AQMP.

[8] MBUAPCD, 2004 AQMP, September 2004, Table 2-2.
[9] Under the Federal one-hour standard, the NCCAB was classified as a maintenance area for ozone.

Table 4.7-8: NCCAB Attainment Status [10]

Criteria Pollutant	Federal Status	State Status
Ozone –1 hour	Not Applicable	Nonattainment Transitional
Ozone – 8 hour	Attainment	Not Applicable
Carbon Monoxide	Unclassified/Attainment	Monterey – Attainment San Benito – Unclassified Santa Cruz – Unclassified
Nitrogen Dioxide	Unclassified/Attainment	Attainment
Sulfur Dioxide	Unclassified	Attainment
Inhalable PM_{10}	Attainment	Nonattainment
Inhalable $PM_{2.5}$	Unclassified	Not Applicable

Senate Bill No. 656 is a new planning requirement that calls for a plan and strategy for reducing $PM_{2.5}$ and PM_{10}. This bill requires CARB to identify, develop and adopt a list of control measures to reduce the emissions of $PM_{2.5}$ and PM_{10} from new and existing stationary, mobile, and area sources. The MBUAPCD has developed particulate matter control measures and submitted a plan to CARB that includes a list of measures to reduce particulate matter. Under the plan, the District is required to continue to assess $PM_{2.5}$ and PM_{10} emissions and their impacts. The PM plan was officially adopted by the District Board in December 2005.

The NCCAB is in attainment with the federal eight-hour ozone standard, whereas the air basin was a nonattainment area under the former one-hour ozone standard. The NCCAB is under the authority of the MBUAPCD which was required to write a Federal Maintenance Plan (FMP) in 1994 for ozone. This document still applies today. The MBUAPCD is not required to update the plan but is required to continue monitoring ozone emissions.

General Conformity

The federal CAA Section 176(c) prohibits federal entities from taking actions (e.g., funding, licensing, permitting, or approving projects) in NAAQS nonattainment or maintenance areas which do not conform to the State Implementation Plan (SIP) for the attainment and maintenance of NAAQS pursuant to Section 110(a) of the CAA. The purpose of conformity is to:

- Ensure federal activities do not interfere with the budgets in the SIP;
- Ensure actions do not cause or contribute to new violations;
- Ensure attainment and maintenance of the NAAQS.

Conformity to an implementation plan means:

[10] MBUAPCD, CEQA Air Quality Guidelines, October 1995 (last revised June 2004), Table 6-1

- Conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards.

- That such activities would not: (1) cause or contribute to any new violation of any standard in any area; (2) increase the frequency or severity of any existing violation of any standard in any area; or (3) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area. The determination of conformity should be based on the most recent emissions, and such emissions should be determined from the most recent population, employment, travel, and congestion estimates as determined by the metropolitan planning organization or any other agency authorized to make such estimates.

Notwithstanding contemporaneous attainment status, the Proponent's Proposed Project would nevertheless comply with the conformity requirements as stated in Section 176(c) of the CAA. No entity may take action in this area that does not conform to the SIP for the attainment and maintenance of the NAAQS in the NCCAB. An analysis of impacts of the project to the NCCAB must be conducted prior to any project construction within the region.

4.7.2 ENVIRONMENTAL RESOURCE IMPACTS STANDARDS AND METHODS

Standards of Significance

In accordance with state and county CEQA Guidelines, MBUAPCD CEQA Air Quality Guidelines, and agency and professional standards, a project impact would be significant if it would:

- Violate any air quality standard or contribute to an odor problem;

- Cause a cumulatively considerable net increase in criteria pollutant emissions in nonattainment areas;

- Contribute substantially to an existing or projected air quality violation by exposing sensitive receptors (e.g., schools, daycare centers, hospitals, nursing homes) to substantial pollutant concentrations; or

- Be inconsistent with the AQMP.

The MBUAPCD has established recommended thresholds of significance to be used to evaluate air quality impacts for construction and operation. For direct and indirect operational impacts, the thresholds and estimated emissions for the Proponent's Proposed Project and Alternatives 1 through 4 are shown in Table 4.7-9.

Table 4.7-9: Comparison of Estimated Emissions for Significance

Project Option	NO_X	SO_X	CO	PM_{10}	VOC	PM_{10F}
	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
Significance Threshold[11]	137	150	550	82	137	82
Proponent's Proposed Project	443	0	524	25	62	708
Alternative 1 (Dam Notching)	241	0	286	13	34	419
Alternative 2 (Dam Removal)	725	1	858	40	101	1257
Alternative 3 (Reroute and Removal)	491	0	572	27	68	1092
Alternative 4 (No Project)	0	0	0	0	0	0

As shown in Table 4.7-9, various project alternatives exceed MBUAPCD significance thresholds for daily mass emissions NO_X, CO, and fugitive PM_{10}., Determination of significance in this assessment is based on screening dispersion modeling[12] results which estimate relative ambient air quality impacts with respect to state and federal air quality standards. Thus, if a modeled concentration, when added to the maximum recent historic background concentration, does not exceed an applicable standard, it could be argued that there is no significant impact to ambient air quality from project alternative activities. However, the MBUDAPCD stated in its comments on the draft EIR that because it is a precursor to the formation of ozone in an air basin that is non-attainment for the state ozone standard, NO_X is a criteria pollutant of regional (not only local) significance and the distance of the nearest residential receptors does not eliminate the impact of emissions of 443 lbs/day, when the threshold of significance is 137 lbs/day. To the extent that NO_X emissions contribute to a regional incremental increase of NO_X, there could be a potential significant environmental impact on ambient air quality from project alternative activities.

Temporary emissions from construction activities consistent with the proposed project schedule are estimated for vehicle traffic, off-road equipment, and fugitive road dust. Blasting emissions are not included since there are no EPA-approved emission factors for civil demolition blasting. Also, blasting emissions would be transient (under one hour) and relatively small compared to other construction emissions, and therefore can be safely ignored in assessing daily and annual ambient impacts at the screening level.

Some roads used for the project would be improved with several inches of Class II base rock and a double chip seal coat. Paving reduces generation of road dust generally equivalent to watering of unpaved roads. All roads in this screening assessment are treated as moderately watered (continuously moist) for screening assessment purposes[13]. Fugitive PM_{10} emissions are based on equipment activity for each alternative that includes silt management, as applicable.

[11] MBUAPCD, CEQA Air Quality Guidelines, October 1995 (last revised June 2004), Table 5-1
[12] Refined dispersion modeling is beyond the scope of this study.
[13] A dry paved road with a fine layer of carryover dust is assumed to be generally equivalent to a moderately watered unpaved road in an industrial or construction setting for the screening assessment.

Screening Impact Assessment Methodology

For diesel-powered on-road trucks, CARB EMFAC 2002 output was used to estimate criteria pollutants (i.e., emission factors) in diesel exhaust (NO_X, SO_X, CO, PM_{10}, and ROC) pursuant to the following parameters (SO_X emission factors calculated from empirical values):

- Monterey Bay area
- Average annual emissions (i.e., 4-season)
- Model year 2000 with 100,000 miles (consistent with typical vehicle age)
- Standard inspection & maintenance (I/M) program
- 37.1 percent engine efficiency (South Coast Air Quality Management District [SCAQMD] CEQA Air Quality Handbook, Table A9-3-A)
- 15 ppm S in diesel fuel (required in California after 1/1/06)
- ROC includes exhaust, hot soak, and running loss

For fugitive PM_{10F} from road dust, from EPA AP-42 Chapter 13.2.2 equation 1a is applicable for vehicles on unpaved roads at industrial sites (EPA 2006):

$E = [K (S/12)^a (W/3)^b] [1-C] (453.59)$ g/mile, where:

K = 1.5	Constant, Table 13.2.2-2
S = 8.5	Silt content, percent Table 13.2.2-1
a = 0.9	Exponent, Table 13.2.2-2
W = 2.5 – 35	Mean vehicle weight in tons, varies per class
b = 0.45	Exponent, Table 13.2.2-2
C = 0.75	Default control efficiency, Fig. 13.2.2-2, minimum moisture ratio = 2

Table 4.7-10 shows the resultant emission factors for diesel exhaust and fugitive dust based on the above methodologies.

Table 4.7-10: On-Road Diesel Truck Emission Factors in Grams per Mile

Emission Factors	NO_X	SO_X	CO	PM_{10}	ROC	PM_{10F}
Type I Light Duty Truck	0.158	0.008	1.987	0.006	0.202	115
Type II Light Duty Truck	0.326	0.009	2.579	0.012	0.225	175
Medium Duty Truck	0.585	0.010	3.008	0.016	0.302	224
Type I Light Heavy Duty Truck	1.603	0.013	0.537	0.021	0.144	267
Type II Light Heavy Duty Truck	3.203	0.016	0.696	0.034	0.235	305
Medium Heavy Duty Truck	9.224	0.022	2.167	0.180	0.257	341
Heavy Heavy Duty Truck	12.785	0.036	0.810	0.146	0.249	375

The implementation of practical and cost-effective NO_X controls for diesel vehicles and equipment, such as Viscon, could reduce NO_X emissions up to 25 percent. However, reducing on-road vehicle emissions alone would not reduce NO_X emissions from project activities below significance (137 lb/day NO_X), since the bulk of these emissions are from off-road equipment, as summarized in Table 4.7-9 and detailed below. Since it is unlikely NO_X mass emissions could be reduced below the significance threshold, screening dispersion modeling is used to determine significance in this assessment, as described above.

For EIR/EIS preliminary screening analysis of off-road construction equipment, (URBEMIS 2002 Appendix H per 40 CFR 89.112 Tier 1) emission factors shown in Table 4.7-11 assume 37.1 percent efficiency (per SCAQMD CEQA guidelines) and use of California ultra-low sulfur diesel fuel (15 ppm S by weight). Please note: the Tier 1 factors were used in the preliminary estimate to account for the use of older, hired equipment (i.e., worst case). During the permitting process, it may be deemed appropriate to use Tier 2 factors, or a composite of Tier 1 and Tier 2 factors.

Appendix X contains tables showing information on the types of on-road vehicles to be used in the project and the projected utilization of each vehicle (average speed assumed is 15 mph). As explained above, EMFAC 2002 emission factors are used to estimate on-road vehicle emissions for the project alternatives.

The URBEMIS model is designed for estimating typical urban traffic impacts from residential, educational, recreational, retail, commercial, and industrial development. Non-typical projects such as dam construction work in a rural setting are not part of the URBEMIS model. As such, the URBEMIS model is not applicable for this type of project application. However, URBEMIS emission factors can be used to estimate off-road emissions as described above and shown in Table 4.7-11 below.

Table 4.7-11: Off-Road Diesel Equipment Emission Factors in Grams per BHP-hr[14]

Emission Factors	NO_X	SO_X	CO	PM_{10}	ROC
Off-Road Equipment (Tier 1)	6.9	0.005	8.5	0.4	1.0

[14] Same as U.S. EPA Tier 1, 40 CFR 89.112

Estimated truck and trip data was provided by Higgins & Associates (1998) for low, medium, and high increments (access road construction, dam thickening, and dam removal, respectively). Estimated off-road construction equipment and activity data was also provided for the Dam thickening (Proponent's Proposed Project) and dam removal (Alternative 2) scenarios. Based on these scenarios, empirical estimates were made for Alternatives 1 and 3. Emission calculations (Appendix X) were performed using standardized multi-variable spreadsheet templates designed to evaluate different project scenarios. As shown in Appendix X, estimated on-road NO_X emissions for the Proponent's Proposed Project and any of the Alternatives (1, 2, or 3) are 5 and 8 pounds per day, respectively, which is small compared to the majority off-road vehicle and equipment NO_X emissions.

The latest version of EPA's SCREEN3 (1995) gaussian plume dispersion model was used to calculate the ground level concentrations of criteria emissions. SCREEN3 is a single source Gaussian plume model which provides maximum ground-level concentrations for point, area, flare, and volume sources, as well as concentrations in the cavity zone, and concentrations due to inversion break-up and shoreline fumigation. The screening dispersion modeling options selected include the use of rural dispersion parameters and regulatory default options. The input file specified information regarding the subject emission sources including location, type (segmented area), and emission rate (g/sec). Default (internal) meteorological data were utilized in conjunction with the SCREEN3 model (i.e., stability class E, standard deviation or sigmatheta of horizontal wind direction between 3.8 and 7.5 degrees). Maps and aerial photographs of the project site and vicinity were used to determine approximate locations of emission sources and distances to receptors for the assessment. Release parameters used for the assessment are shown in Table 4.7-12.

Table 4.7-12: SCREEN 3 Release Parameters

Release Parameter	Units	4R	Dam	Access
Source Type	**Label**	**Area**	**Area**	**Area**
Long Side	meters	1360	600	1600
Short Side	meters	8	600	8
Long Side (segment)	meters	80	n/a	80
Release Rate (unit)	g/sec-m^2	1	1	1
Release Rate (segment)	g/sec-m^2	0.059	n/a	0.050
Release Height	meters	2.5	25	2.5
Receptor Height	meters	1.5	1.5	1.5
Dispersion Coefficient	Urban/Rural	Rural	Rural	Rural
Range of Directions	Yes/No	Yes	Yes	Yes
Stability Class	A-F	E	E	E
Automated Distance Array	Yes/No	Yes	Yes	Yes
Minimum Distance	meters	10	10	10
Maximum Distance	meters	1000	1000	1000

It should be noted that the screening model in area source mode (e.g., 8 m x 80 m road segments which simulate a line source) does not take into account 1) actual meteorology data, 2) complex terrain, and 3) downwash. It is a basic tool for ranking relative impacts assuming hypothetical "worst case" stability class E, which is

sigmatheta (standard deviation) of horizontal wind direction between 3.8 and 7.5 degrees. Nevertheless, the impact assessment conservatively demonstrates that while the project does not significantly impact or degrade existing ambient concentrations of CO, PM_{10} (primarily from road dust) is increased and thus would require mitigation (e.g., sufficient periodic road watering). While the modeled concentration of NO_X, when added to the maximum recent historic background concentration, does not exceed an applicable standard, the MBUBAPCD has expressed concerns regarding the incremental addition of NO_X to regional air quality levels. Mitigation measures to reduce NO_X are discussed below.

4.7.3 IMPACTS AND MITIGATION

The following impact issues have been defined for air quality:

AQ-1: Dam Site Activities (short-term emissions from construction equipment and road dust)

AQ-2: Access Road Upgrades (short-term dust and other emissions during access road improvements)

AQ-3: Project-Generated Traffic (short-term dust and other emissions during project-related travel)

AQ-4: Concrete Batch Plant Operation (operation of a new, short-term stationary source)

Proponent's Proposed Project (Dam Thickening)

Issue AQ-1: Dam Site Activities

Short-term emissions from construction equipment and road dust
Determination: ***significant, unavoidable, short-term***

IMPACT

Construction activities would generate temporary emissions from diesel-powered equipment and road dust. Fugitive dust, if not mitigated, could exceed the MBUAPCD construction threshold of significance for PM_{10} only. This would be a potentially significant unavoidable impact.

The Proponent's Proposed Project would have no operational impacts because it would not create any new air pollutant sources nor generate new employee vehicle trips. The Proponent's Proposed Project would affect regional and local air quality during construction. The level and types of activities would vary over the construction period, but the activities with the greatest potential to generate air pollutants are materials delivery (aggregates); and concrete placement (pouring, securing). These phases represent the periods of greatest pollutant generation, at other times less-polluting

activities such as land surveying, land clearing, reservoir dewatering, site preparation, and integrity testing would occur.

SCD is in an isolated portion of the Carmel River Valley. During daytime hours, prevailing winds would carry emissions up-river or towards the east. The closest receptors are residences in the Sleepy Hollow Subdivision, which is located along San Clemente Drive, as shown in Figure 4.7-1. These homes would be quite distant (3900 to 5300 meters from the Dam site) and generally upwind of construction activity at the Dam itself. Therefore localized dust created by sand blasting and drilling dowel holes during preparation of the existing dam surface would not impact any receptors. Emissions associated with concrete trucks hauling materials from the batch plant to the Dam site would also occur at a substantial distance and downwind of these receptors.

Tables 4.7-13 and 4.7-14 show estimated aggregated maximum emissions in pounds per day and tons per year at the Dam for the various activities that would occur during project construction. Two primary types of emission sources have been estimated: 1) diesel fuel combustion in vehicle and equipment engines, and 2) generation of fugitive road dust (PM_{10F}). The tables distinguish the generation of fugitive dust (PM_{10F}) from PM_{10} emitted from combustion sources (due to different emission estimation techniques), although the same standard applies to both.

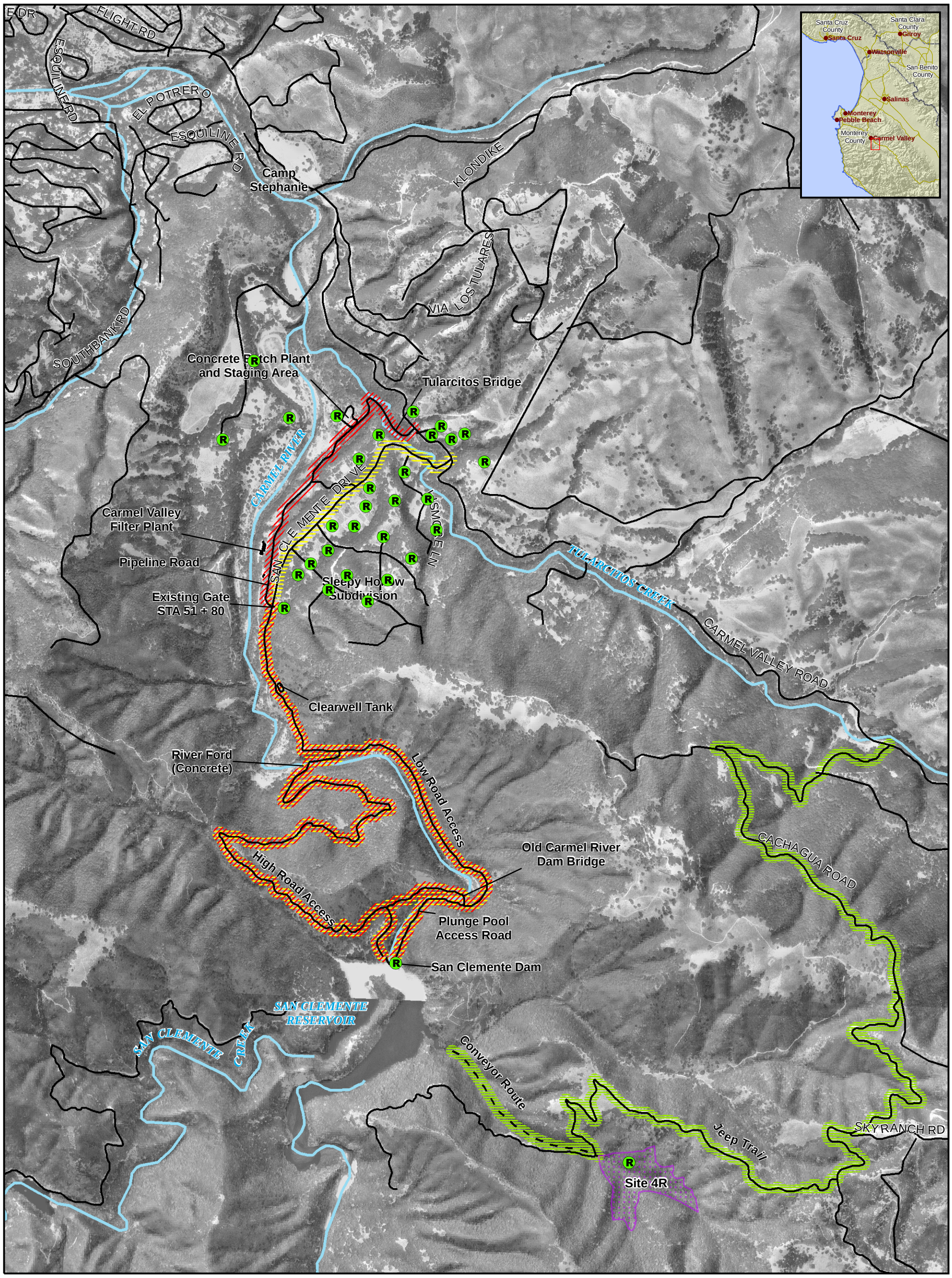
Table 4.7-13: Estimated Temporary Daily Construction Emissions — Proponent's Proposed Project

Location	NO_X	SO_X	CO	PM_{10}	ROC	PM_{10F}
	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
Dam Site	430	0	523	25	62	322

Table 4.7-14: Estimated Temporary Annual Construction Emissions — Proponent's Proposed Project

Location	NO_X	SO_X	CO	PM_{10}	ROC	PM_{10F}
	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr
Dam Site	54	0	66	3	8	23

Table 4.7-13 shows that estimated daily emissions from fuel combustion at the Dam and sediment handling could exceed the 137 pound per day level of significance for NO_X contained in Table 4.7-9. However, Tables 4.7-15 and 4.7-16 show that maximum estimated NO_X impacts would be below state and federal ambient air quality standards (338 µ/m3 hourly and 100 µ/m3 annual, respectively).



Legend

Access Routes
- Cachugua / 4R
- Sleepy Hollow
- Tularcitos
- Sleepy Hollow / Tularcitos*

*Note: Sleepy Hollow and Tularcitos access routes share the same roads between the filter plant and the dam

- Stream
- Existing Road
- Proposed Road
- Sediment Disposal Site

R Sensitive Receptor

Projection: California State Plane, Zone IV
Datum: NAD 83 Units: Feet

San Clemente Dam EIS/EIR

Figure 4.7-1

Sensitive Receptors Map

0 0.15 0.3 0.6

Miles

N

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Table 4.7-15: Estimated NO_X Impact in Residential Zone Proponent's Proposed Project

Criteria Pollutant	Averaging Period	Modeled Concentration	Background Concentration	Total Concentration
		µ/m3	µ/m3	µ/m3
Nitrogen Oxides (as NO_2)	1-hour	5.7	266	272
	Annual	0.5	23	23

Table 4.7-16: Estimated NO_X Impact at Dam Site Proponent's Proposed Project

Criteria Pollutant	Averaging Period	Modeled Concentration	Background Concentration	Total Concentration
		µ/m3	µ/m3	µ/m3
Nitrogen Oxides (as NO_2)	1-hour	41.6	266	308
	Annual	3.3	23	26

Incremental ambient NO_X in the residential zone is 5.7 µ/m3, an increase of 2.1 percent above the maximum hourly background concentration of 266 µ/m3 for a total of 272 µ/m3, which is under the state standard of 338 µ/m3. Such an increase would not be measurable by an ambient NO_X monitor since it lies within the daily calibration bandwidth of the instrument (2.5 percent Hourly NO_X impacts at the Dam site are slightly greater, 15.6 percent but still below the state standard. The federal annual NO_X standard of 100 μ/m^3 is not exceeded at the residential zone or the Dam site is. The nearest residential receptors are located far enough from the Dam site (3,900 to 5,300 meters) that only a limited amount of dispersed NO_X would be transported by wind due to diffusion. Although very small, there may be an incremental significant unavoidable impact on ambient air quality in distant residential areas or at the Dam site from NO_X emissions, because these emissions are above the mass emissions significance threshold.

Estimated emissions of fugitive dust (PM_{10F}) could potentially exceed the PM_{10} threshold of 82 lb/day by a significant amount, thus requiring mitigation in order to minimize ambient air impacts. Table 4.7-17 summarizes the PM_{10} impacts of the Proponent's Proposed Project.[15]. The 550 pound per day CO level of significance is not exceeded by the Proponent's Proposed Project.

Table 4.7-17: Estimated PM_{10} Impact Summary Proponent's Proposed Project

Location	Averaging Period	Modeled Concentration	Background Concentration	Total Concentration
		µ/m3	µ/m3	µ/m3
Dam Site Average	1-hour	33.6	–	–
	24-hour	13.4	57	70
	Annual	2.7	15	18

[15] For a description how emission rates (lb/day) are translated to ambient air impacts (µ/m3), refer to Impact Assessment Methodology at the end of this section.

MITIGATION

There are several feasible mitigation measures that address the many sources of PM_{10} during the construction phase of a project (e.g., grading, wind erosion, entrained dust). Common measures include watering, chemical stabilization, or reducing surface wind speeds with windbreaks. Summarized below are feasible mitigation measures for PM_{10}, the source of emissions that would be affected, the effectiveness of the measure in mitigating emissions, and the source of assumptions. The effect of a mitigation measure can be quantified by identifying the source of PM_{10} that would be affected, estimating emissions from the source, and applying a mitigation effectiveness factor to those emissions. For example, watering active, unpaved construction areas with full coverage can reduce fugitive PM_{10} from construction equipment and other mobile sources by 50 percent, reducing daily emissions from 70 lb/day/acre to 35 lb/day/acre.

Because construction-related emissions of PM_{10} vary based on a number of factors (e.g., activity types, area of activity, silt content), the level of mitigation necessary to reduce impacts below significance would vary and would be monitored during construction by the owner's engineer or consultant, to assure that actual mitigation is effective. In general, mitigation measures that address larger sources of PM_{10} during construction (e.g., grading, excavation, entrained dust from unpaved roads) have the greatest potential to substantially reduce fugitive dust to a less than significant level. Mitigation measures for the Proponent's Proposed Project include:[16]

- Water all active construction areas and access roads at least twice daily. Frequency would be based on the type of operation, soil, and wind exposure.
- Prohibit all grading (e.g., sediment removal) activities during periods of high wind (over 15-mph).
- Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).
- Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed area.
- Haul trucks would maintain at least 2 feet of freeboard.
- Cover all trucks hauling dirt, sand, or loose materials.
- Seed or plant vegetative ground cover in disturbed areas as soon as possible.
- Cover inactive storage piles with tarps
- Post a publicly visible sign giving the telephone number and person to contact regarding dust complaints. This person would respond to complaints and take

[16] MBUAPCD, CEQA Air Quality Guidelines, October 1995 (last revised June 2004), Table 8-2

corrective action within 48 hours. The phone number of the MBUAPCD would be visible to ensure compliance with Rule 402 (Nuisance).

Emissions of NO_X from heavy duty equipment would be reduced by using practical and cost-effective NO_X controls for diesel vehicles and equipment in order to minimize emissions. Since daily CO emissions are below the level of significance, no CO mitigation would be required. The Applicant would implement practical and cost-effective PM_{10} controls for access roads, including paving and coarse graveling, in addition to periodic watering, along with practical and cost-effective NO_X controls for diesel vehicles and equipment, such as Viscon[17]. The Applicant would utilize, to the maximum extent possible, state-certified construction equipment in the Portable Equipment Registration Program (PERP) which is pre-approved for use in any district by CARB. The applicant would work closely with district staff upon commencement of permitting activities consistent with project scheduling requirements.

Issue AQ-2: Access Road Upgrades

Short-term dust and other emissions during access road improvements
Determination: ***significant, unavoidable, short-term***

IMPACT

Construction activities during access road improvements would sometimes be upwind of residential neighborhoods and, if not mitigated, create the potential for dust nuisance complaints. This would be determined by several factors, including the amount of emissions, distance between the source of emission and receptors, and prevailing wind direction when construction activities occur.

Access road associated emissions would be relatively small compared to proposed and alternative project emissions. The small differences in emissions between the San Clemente Drive or Tularcitos access routes would have little effect on the comparative ambient air quality impacts of the Proponent's Proposed Project and action alternatives. Therefore, a typical set of access road-related emissions have been developed for evaluation of the routes. The results presented in Tables 4.7-18 and 4.7-19 for the existing (San Clemente Drive) access route and the alternative (Tularcitos) demonstrate the negligible difference between the two routes. These data indicate that for the Proponent's Proposed Project, the greatest potential for dust nuisance would occur during construction of access road improvements and during the aggregate delivery phase of the project, when up to 20 trucks trips per day would use the improved access road and from cement trucks hauling from the batch plant to the Dam. Depending on the weather and the types of amounts of activity along the new access road, a temporary potential for dust nuisance could exist at the closest homes within the Sleepy Hollow Subdivision prior to implementation of mitigation measures, as discussed below.

[17] While Viscon can reduce NOx emissions by about 25 percent, the use of Viscon would not lower NO_X emissions below the 137 pound per day significance threshold (0.75 x 443 lb/day = 332 lb/day).

Table 4.7-18: Estimated Daily Construction Emissions — Road Construction

Location	NO_X	SO_X	CO	PM_{10}	VOC	PM_{10F}
	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
San Clemente Drive	0.43	0.00	0.10	0.01	0.01	16
Tularcitos Route	0.41	0.00	0.10	0.01	0.01	15
Typical	0.42	0.00	0.10	0.01	0.01	16

Table 4.7-19: Estimated Annual Construction Emissions — Road Construction

Location	NO_X	SO_X	CO	PM_{10}	VOC	PM_{10F}
	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr
San Clemente Drive	0.02	0.00	0.01	0.00	0.00	0.8
Tularcitos Route	0.02	0.00	0.00	0.00	0.00	0.7
Typical	0.02	0.00	0.01	0.00	0.00	0.8

Table 4.7-18 shows that estimated daily emissions from fuel combustion would not exceed any level of significance contained in Table 4.7-1. However, estimated emissions of fugitive dust (PM_{10F}) could potentially be about one-half the PM_{10} threshold of 82 lb/day. At this level of emission, mitigation would be a good construction site practice. Due to the nuisance level that could occur to residence of Sleepy Hollow, the impact would be significant and unavoidable for short periods of time.

MITIGATION

Dust generation due to travel on unpaved roads between the batch plant and the Dam is a potentially significant impact (see Table 4.7-13) that could be reduced to a less than significant level by requiring contractors to minimize dust generation during construction through implementation of the following dust suppression techniques, which could reduce fugitive PM_{10} emissions from unpaved roads below the 82 lb/day threshold:

- Use crushed rock as a final base on the unpaved service roads from Center Court Place to the Batch Plant, and from the Batch Plant to the Filter Plant to minimize dust generation in the vicinity of the Sleepy Hollow subdivision. According to the project engineer, placement of crushed rock would make the roads more driveable and would also keep dust down.

- Use watering trucks and adequate quantities of water to suppress dust on unpaved or unrocked roads, parking areas, staging areas and the batch plant. Water quality BMPs (see Section 4.5) would avoid introducing sediment into the river and creeks. The amount and frequency of water application would be adjusted for weather conditions to maintain a minimum average soil moisture ratio of 5, for 95 percent or greater dust suppression. Non-toxic chemical stabilizers or dust suppressants would be applied to unpaved haul roads. These may consist of materials that are added to

the water prior to application, or materials worked into the road surface that increases the efficiency of subsequent wetting with water.

- As traffic and weather allow, regularly vacuumsweep (municipal street sweeper) accumulated soil from the surface of Center Court Place and affected portions of San Clemente Drive to prevent introducing sediment into river and creeks.

- Impose and enforce a 15-mph speed limit for all vehicles on unpaved haul roads.

The Applicant would implement practical and cost-effective PM_{10} controls for access roads, including paving and coarse graveling, in addition to periodic watering, along with practical and cost-effective NO_X controls for diesel vehicles and equipment, such as Viscon[18]. The Applicant will utilize, to the maximum extent possible, state-certified construction equipment in the PERP, which is pre-approved for use in any district by the Air Resources Board. The Applicant will work closely with district staff upon commencement of permitting activities consistent with project scheduling requirements.

Issue AQ-3: Project-Generated Traffic

Short-term dust and other emissions during project-related travel

Determination: ***significant, unavoidable, short-term***

Construction activities during access road improvements and truck travel on the unpaved service road to and from the concrete batch plant site would sometimes be upwind of residential neighborhoods and, if not mitigated, create the potential for dust nuisance complaints.

Worker travel consists of motor vehicle exhausts from contractor employee trips to and from the project site. Truck travel represents on-road trucks delivering construction materials to the site. Fugitive emissions are mainly the result of mechanical action of vehicle wheels on unpaved earth surfaces. On-site vehicles and equipment consist of concrete trucks and other diesel-powered construction equipment. Unpaved road dust would be raised by the material delivery and concrete trucks traveling on the graveled interior haul roads.

Use of existing paved roads and improvement of unpaved access roads to the concrete batch plant site and the CVFP should generate less than significant levels of dust during the road building phase. However, as shown in Table 4.7-9, PM_{10} emissions could exceed the MBUAPCD threshold during material delivery and concrete placement. This would primarily be due to travel on unpaved roads between the CVFP and Dam.

Again, emissions associated with project-generated traffic would vary relatively little between the Proponent's Proposed Project and the action alternatives. The analysis utilized the roads nearest the receptor area to access PM_{10} impacts on those receptors.

[18] While Viscon can reduce NO_X emissions by about 25 percent, the use of Viscon would not lower NO_X emissions below the 137 pound per day significance threshold (0.75 x 443 lb/day = 332 lb/day).

Although the routes for the alternatives are different from the Proponent's Proposed Project, the distance to the receptor location via each route is approximately the same. These small differences in emissions would have negligible effect on comparative ambient air quality impacts. Therefore, a typical set of project traffic-related emissions have been developed for evaluation of all of the alternatives.

Typical fugitive dust (PM_{10F}) emissions are shown in Table 4.7-20 in terms of background concentrations, modeled increments that result from project-related traffic, and total resulting concentrations. Estimated emissions of fugitive dust (PM_{10F}) could exceed the PM_{10} threshold of 82 lb/day, which would be a significant unavoidable impact.

Table 4.7-20: Estimated PM_{10} Impact Summary
Proponent's Proposed Project

Location	Averaging Period	Modeled Concentration	Background Concentration	Total Concentration
		µ/m3	µ/m3	µ/m3
Access Roads (typical)	1-hour	10.6	–	–
	24-hour	4.2	57	61
	Annual	0.8	15	16

MITIGATION

The project impact identified above could be reduced with implementation of Mitigation Measure AQ-2 (Access Road Upgrades) and the following additional measures:

Provide Sleepy Hollow residents with a card containing the telephone number and person to contact regarding dust, traffic and noise complaints as well as providing construction schedule information. This person would respond to complaints and arrange for corrective action to be taken within 24 hours. The phone number of the MBUAPCD would also be provided.

The applicant would be responsible for ensuring that the mitigation measures are implemented. Agencies and local government issuing permits would enforce compliance with permit conditions. Construction monitoring would be conducted to assure that permit requirements, resource protection measures, and mitigation measures are followed. The owner's contracts would embody pertinent requirements, and the applicant would require contractors to comply with the terms of their contracts. The project management would post a publicly visible sign in the Sleepy Hollow area giving the telephone number and project contact person to contact regarding dust or noise complaints:

- The project contact person would respond to complaints and take corrective action within 48 hours.

- Corrective actions would require that all fugitive dust and noise mitigation measures listed above be verified (i.e., checked and inspected) for implementation and effectiveness.

- As a backstop measure, the complaint line telephone numbers of the MBUAPCD and Monterey County Resource Management Agency would also be posted to ensure compliance with applicable nuisance rules (e.g., MBUAPCD Rule 402, Nuisance).

Issue AQ-4: Concrete Batch Plant Operation

Operation of a new, short-term stationary source
Determination: ***less than significant with mitigation, short-term***

The concrete batch plant would be subject to regulation by the MBUAPCD as a temporary stationary source. In general, New Source Review (NSR) rules would require the following conditions to be met in order to obtain an operating permit:

- Best Available Control Technology (BACT);

- Offsets (nonattainment pollutants over regulatory threshold);

- Protection of ambient air quality;

- Certification of statewide compliance for all sources under common ownership and/or operational control; and

- For sources subject to CEQA, analysis of alternatives.

Under MBUAPCD rules, a nonexempt stationary source must be permitted, and a permit would not be issued unless the proposed source meets all applicable MBUAPCD rules and regulations regarding emission limits, opacity limits, control requirements, offsets and other limitations or conditions. The MBUAPCD also enforces compliance with Rule 402 (Nuisance).

MITIGATION

Under general NSR rules described above, batch plant emissions would be mitigated by jurisdictional MBUAPCD temporary source operating permit conditions, which would likely require powering of the batch plant with electricity (i.e., no diesel fuel combustion emissions) and fugitive dust control measures (e.g., water sprays, pneumatic dust collectors).

The batch plant requires a level area approximately 5 acres (about 218,000 square feet) in size with good road access in order to move in/out the larger pieces of batch pant equipment and aggregate materials. This limits possible sites for the batch plant to generally near Carmel Valley Road, and not up the canyon closer to the Dam due to mountainous terrain and narrow, winding access roads. Thus, it is not technically

feasible to locate the batch plant closer to the Dam. Also, the proximity of electric power lines may avoid the use of diesel generators for batch plant operation, thus avoiding emissions of NO_X, CO, ROC, SO_2 , and diesel fine particulate (PM_{10}).

The Applicant will work closely with district staff upon commencement of permitting activities consistent with project scheduling requirements.

Alternative 1 (Dam Notching)

Impacts and mitigation for Air Quality Issues AQ-2 (Access Road Upgrades) and AQ-3 (Project-Generated Traffic) would be the same as the Proponent's Proposed Project except the mitigation would also include the Cachagua Access Route. Issue AQ-4 (Concrete Batch Plant) would not apply to Alternative 1.

Issue AQ-1: Dam Site Activities

Short-term emissions from construction equipment and road dust
Determination: ***significant, unavoidable, short-term***

Refer to Proponent's Proposed Project for a general discussion of construction activities as they relate to air quality effects. For Alternative 1, Tables 4.7-21 and 4.7-22 show estimated aggregated maximum emissions in pounds per day and tons per year that would occur at the dam site and sediment disposal site.

Table 4.7-21: Estimated Daily Construction Emissions Alternative 1

Location	NO_X	SO_X	CO	PM_{10}	ROC	PM_{10F}
	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
Sediment Disposal Site	9	0	1	0	0	254
Dam Site	233	0	285	13	34	164
Totals	241	0	286	13	34	419

Table 4.7-22: Estimated Annual Construction Emissions Alternative 1

Location	NO_X	SO_X	CO	PM_{10}	ROC	PM_{10F}
	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr
Sediment Disposal Site	0	0	0	0	0	13
Dam Site	35	0	43	2	5	25
Totals	35	0	43	2	5	37

Table 4.7-23 shows estimated daily emissions from fuel combustion at the Dam and sediment disposal sites. Impacts are similar to those discussed for the Proponent's Proposed Project in that although emissions at these sites could exceed the level of significance for mass emissions of NO_X, maximum estimated NO_X impacts to the nearest residential receptors would be below the state and federal ambient air quality standards (338 µ/m3 hourly and 100 µ/m3 annual, respectively) (Tables 4.7-23 and 4.7-24).

Table 4.7-23: Estimated NO_X Impact in Residential Zone Alternative 1

Criteria Pollutant	Averaging Period	Modeled Concentration	Background Concentration	Total Concentration
		µ/m3	µ/m3	µ/m3
Nitrogen Oxides (as NO_2)	1-hour	3.8	266	270
	Annual	0.3	23	23

Table 4.7-24: Estimated NO_X Impact at Dam Site Alternative 1

Criteria Pollutant	Averaging Period	Modeled Concentration	Background Concentration	Total Concentration
		µ/m3	µ/m3	µ/m3
Nitrogen Oxides (as NO_2)	1-hour	22.5	266	289
	Annual	1.8	23	25

Although very small, there may be a significant unavoidable impact on ambient air quality in distant residential areas or at the dam site from NO_X emissions, because these emissions are above the mass emissions significance threshold. As for Alternative 1, estimated emissions of fugitive dust (PM_{10F}) could exceed the PM_{10} threshold (Table 4.7-25).

Table 4.7-25: Estimated PM_{10} Impact Summary Alternative 1

Location	Averaging Period	Modeled Concentration	Background Concentration	Total Concentration
		µ/m3	µ/m3	µ/m3
Site 4R Average	1-hour	125.6	–	–
	24-hour	50.2	57	107
	Annual	10.0	15	25
Dam Site Average	1-hour	17.2	–	–
	24-hour	6.9	57	64
	Annual	1.4	15	16

Neither the residential zone nor the dam site exceeds the federal annual NO_X standard of 100 µ/m3. The nearest residential receptors are located far enough from the dam site (3900 to 5300 meters); only a limited amount of dispersed NO_X would be transported by wind due to diffusion. Although very small, there may be an incremental, significant unavoidable impact on ambient air quality in distant residential areas or at the dam site from NO_X emissions, because these emissions are above the mass emissions significance threshold.

MITIGATION

Air quality mitigation measures would be the same as for the Proponent's Proposed Project.

Alternative 2 (Dam Removal)

Impacts and mitigation for Air Quality Issues AQ-2 (Access Road Upgrades) and AQ-3 (Project-Generated Traffic) would be the same as the Proponent's Proposed Project except the mitigation would also include the Cachagua Access Route. Issue AQ-4 (Concrete Batch Plant) would not apply to Alternative 2.

Temporary emissions from construction activities associated with Alternative 2 are estimated for vehicle traffic, off-road equipment, and fugitive road dust. Blasting emissions are not included since there are no EPA-approved emission factors for civil demolition blasting. Also, blasting emissions would be transient (under one hour) and relatively small compared to other construction emissions, and therefore can be safely ignored in assessing daily and annual ambient impacts at the screening level.

Issue AQ-1: Dam Site Activities

Short-term emissions from construction equipment and road dust
Determination: ***significant, unavoidable, short-term***

Refer to Proponent's Proposed Project (Dam Thickening) for a general discussion of activities as they relate to air quality effects. For Alternative 2, Tables 4.7-26 and 4.7-27 show estimated aggregated maximum emissions in pounds per day and tons per year that would occur at the dam site and sediment disposal site.

Table 4.7-26: Estimated Daily Construction Emissions Alternative 2

Location	NO_X	SO_X	CO	PM_{10}	ROC	PM_{10F}
	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
Site 4R	26	0	2	0	1	763
Dam Site	699	1	856	40	101	494
Totals	725	1	858	40	101	1257

Table 4.7-27: Estimated Annual Construction Emissions Alternative 2

Location	NO_X	SO_X	CO	PM_{10}	ROC	PM_{10F}
	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr
Site 4R	1	0	0	0	0	38
Dam Site	105	0	128	6	15	74
Totals	106	0	128	6	15	112

Table 4.7-26 shows estimated daily emissions from fuel combustion at the Dam and sediment disposal sites. Impacts are similar to those discussed for the Proponent's Proposed Project in that although emissions at these sites could exceed the level of significance for mass emissions of NO_X and CO, maximum estimated NO_X and CO impacts to the nearest residential receptors would be below the state and federal ambient air quality standards (Tables 4.7-28 and 4.7-29).

Table 4.7-28: Estimated NO_X and CO Impact in Residential Zone Alternative 2

Criteria Pollutant	Averaging Period	Modeled Concentration	Background Concentration	Total Concentration
		µ/m3	µ/m3	µ/m3
Nitrogen Oxides (as NO_2)	1-hour	11.3	266	277
	Annual	0.9	23	24
Carbon Monoxide (CO)	1-hour	2.7	4257	4260
	8-hour	1.9	2980	2982

Table 4.7-29: Estimated NO_X and CO Impact at Dam Site Alternative 2

Criteria Pollutant	Averaging Period	Modeled Concentration	Background Concentration	Total Concentration
		µ/m3	µ/m3	µ/m3
Nitrogen Oxides (as NO_2)	1-hour	67.7	266	334
	Annual	5.4	23	28
Carbon Monoxide (CO)	1-hour	82.9	4257	4340
	8-hour	58.0	2980	3038

Although very small, there may be an incremental significant unavoidable impact on ambient air quality in distant residential areas or at the dam site from NO_X emissions, because these emissions are above the mass emissions significance threshold. As with Alternative 2, estimated emissions of fugitive dust (PM_{10F}) could exceed the PM_{10} threshold (Table 4.7-30).

Table 4.7-30: Estimated PM_{10} Impact Summary Alternative 2

Location	Averaging Period	Modeled Concentration	Background Concentration	Total Concentration
		µ/m3	υg/m3	µ/m3
Site 4R Average	1-hour	377.1	–	–
	24-hour	150.8	57	208
	Annual	30.2	15	45
Dam Site Average	1-hour	51.7	–	–
	24-hour	20.7	57	78
	Annual	4.1	15	19

MITIGATION

Air quality mitigation measures would be the same as for the Proponent's Proposed Project.

Alternative 3 (Carmel River Reroute and Dam Removal)

Impacts and mitigation for Air Quality Issues AQ-2 (Access Road Upgrades) and AQ-3 (Project-Generated Traffic) would be the same as the Proponent's Proposed Project except mitigation would also include the Cachagua Access Route. Issue AQ-4 (Concrete Batch Plant) would not apply to Alternative 3.

Short-term emissions from construction activities associated with the Alternative 3 are estimated for vehicle traffic, off-road equipment, and fugitive road dust. Blasting emissions are not included since there are no EPA-approved emission factors for civil demolition blasting. Also, blasting emissions would be transient (under one hour) and relatively small compared to other construction emissions, and therefore can be safely ignored in assessing daily and annual ambient impacts at the screening level.

Issue AQ-1: Dam Site Activities

Short-term emissions from construction equipment and road dust
Determination: ***significant, unavoidable. short-term***

Refer to Proponent's Proposed Project for a general discussion of activities as they relate to air quality effects. For Alternative 3, Tables 4.7-31 and 4.7-32 show estimated aggregated maximum emissions in pounds per day and tons per year that would occur at the dam site and reservoir.

Table 4.7-31: Estimated Daily Construction Emissions Alternative 3

Location	NO_X	SO_X	CO	PM_{10}	ROC	PM_{10F}
	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	Lbs/day
Sediment Site	26	0	2	0	1	763
Dam Site	465	0	570	27	67	329
Totals	491	0	572	27	68	1092

Table 4.7-32: Estimated Annual Construction Emissions Alternative 3

Location	NO_X	SO_X	CO	PM_{10}	ROC	PM_{10F}
	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	Tons/yr
Sediment Site	1	0	0	0	0	38
Dam Site	70	0	86	4	10	49
Totals	71	0	86	4	10	87

Table 4.7-31 shows estimated daily emissions from fuel combustion at the Dam and sediment disposal sites. Impacts are similar to those discussed for the Proponent's Proposed Project in that although emissions at these sites could exceed the level of significance for mass emissions of NO_X and CO, maximum estimated NO_X and CO impacts to the nearest residential receptors would be below the state and federal

ambient air quality standards (Tables 4.7-33 and 4.7-34). Although very small, there may be an incremental significant, unavoidable impact on ambient air quality in distant residential areas or at the dam site from NO_X emissions, because these emissions are above the mass emissions significance threshold. As with the Proponent's Proposed Project, estimated emissions of fugitive dust (PM_{10F}) could exceed the PM_{10} threshold (Table 4.7-35).

Table 4.7-33: Estimated NO_X and CO Impact in Residential Zone Alternative 3

Criteria Pollutant	Averaging Period	Modeled Concentration	Background Concentration	Total Concentration
		µ/m3	µ/m3	µ/m3
Nitrogen Oxides (as NO_2)	1-hour	7.6	266	274
	Annual	0.6	23	24
Carbon Monoxide (CO)	1-hour	1.8	4257	4259
	8-hour	1.2	2980	2981

Table 4.7-34: Estimated NO_X and CO Impact at Dam Site Alternative 3

Criteria Pollutant	Averaging Period	Modeled Concentration	Background Concentration	Total Concentration
		µ/m3	µ/m3	µ/m3
Nitrogen Oxides (as NO_2)	1-hour	45.1	266	311
	Annual	3.6	23	27
Carbon Monoxide (CO)	1-hour	55.2	4257	4312
	8-hour	38.6	2980	3019

Table 4.7-35 Estimated PM_{10} Impact Summary Alternative 3

Location	Averaging Period	Modeled Concentration	Background Concentration	Total Concentration
		µ/m3	µ/m3	µ/m3
Sediment Site Average	1-hour	377.1	–	–
	24-hour	150.8	57	208
	Annual	30.2	15	45
Dam Site Average	1-hour	34.4	–	–
	24-hour	13.8	57	71
	Annual	2.8	15	18

MITIGATION

Air quality mitigation measures would be the same as for the Proponent's Proposed Project.

Alternative 4 (No Project)

No construction activities would be associated with the No Project Alternative; therefore there would be no additional issues related to air quality.

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4.8 NOISE

This section describes the potential impacts of the San Clemente Seismic Safety Project on the noise characteristics in the Project Area. Noise characteristics include sensitive receptors influenced by the project. In response to comments, additional information provided in this Final EIR/EIS clarifies and amplifies the information included in the Draft EIR/EIS. The following environmental setting section was prepared using information developed from the documents provided by the RDEIR (Denise Duffy & Associates 2000).

4.8.1 ENVIRONMENTAL SETTING

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is defined as unwanted sound. Environmental noise is frequently measured in decibels (dB). The A-weighted decibel (dBA) refers to the human ear's sensitivity to sounds of different frequencies. On this scale, the sound level of normal talking is about 60 to 65 dBA. Due to evolutionary factors, humans are more sensitive to nighttime noise; sleep disturbance usually occurs at 40 to 45 dBA.

The most commonly used measurement scale to account for a person's increased sensitivity to nighttime noise is the community noise equivalent level (CNEL). The CNEL is a noise scale used to describe the overall noise environment of a given area from a variety of sources. The CNEL applies a weighting factor to evening and nighttime values.

Excessive noise may not only be undesirable, but also may cause physical and/or psychological damage. The effects of noise, whether ambient or project-related, may be categorized as auditory or non-auditory. Auditory effects include interference with communication and, in extreme circumstances, hearing loss. Non-auditory effects include physiological reactions such as a change in blood pressure or breathing rate, interference with sleep, adverse effects on human performance, and mental well being.

Generally, noise levels diminish with distance from the source of the noise. Some land uses are more sensitive to noise than others. Noise-sensitive land uses include residences, transient lodging, schools, hospitals, nursing homes, churches, meeting halls, and office buildings.

Monterey County Noise Regulations

The Proponent's Proposed Project area is located in an unincorporated portion of Monterey County. The California Department of Health Services (CDHS) Office of Noise Control has established categories for judging the severity of noise impacts on specific land uses based on studies of noise levels and their effects. The Monterey County General Plan (1996) contains a Noise Element that establishes noise exposure standards for land use compatibility based on CDHS categories. According to these standards, shown in Table 4.8-1, normally acceptable exterior noise levels for residential areas are 50 to 60 decibels (day-night sound level [L_{dn}] or CNEL), although

levels between 60 and 70 decibels are conditionally acceptable with appropriate noise insulation and other attenuation measures. Most of areas affected by project noise are isolated and would be passively used open space (Table 4.8-1).

Table 4.8-1: Monterey County Land Use Compatibility Standards for Exterior Community Noise[1]

Land Use Category	Noise Ranges (L_{dn} or CNEL) dBA			
	I	II	III	IV
Passively used open spaces	50	50–55	55–70	70+
Auditoriums, concert halls, amphitheaters	45–50	50–65	65–70	70+
Residential — low density single family, duplex, mobile homes	50–60	60–70	70–75	75+
Residential — multi family	50–60	60–70	70–75	75+
Transient lodging — motels, hotels	50–60	60–70	70–80	80+
Schools, libraries, churches, hospitals, nursing homes	50–60	60–70	70–80	80+
Actively used open spaces — playgrounds, neighborhood parks	50–67	–	67–3	73+
Golf courses, riding stables, water recreation, cemeteries	50–70	–	70–80	80+
Office buildings, business commercial and professional	50–67	67–75	75+	–
Industrial, manufacturing, utilities, agriculture	50–70	70–75	75+	–
Noise Range I — Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any building involved are of normal conventional construction without any special noise insulation requirements.				
Noise Range II — Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, which includes closed windows and conventional air supply systems or air conditioning, will normally suffice.				
Noise Range III — Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.				
Noise Range IV — Clearly Unacceptable: New construction or development should generally not be undertaken.				

Noise Sources in the Proponent's Proposed Project Area

The dominant source of noise in the Carmel Valley project area is traffic on Carmel Valley Road. Carmel Valley Road and San Clemente Drive represent the only access route to the Proponent's Proposed Project area at present. Typical peak noise levels due to passenger vehicles driving by on local streets are 55 to 65 dBA at 15 meters. Trucks, motorcycles, and poorly muffled automobiles produce noise levels 5 to 15 dBA higher.

Traffic noise is controlled by four major factors: speed, acceleration, road grade, and road surface. As speed, acceleration, and road grade increase, and as road surface worsens, vehicular noise levels would increase. Another consideration in highway noise is the escape of air between the tire treads as vehicles travel along the highways. Many four-wheel drive vehicles have large treads that produce excessive noise when traveling at high speeds.

Overflying aircraft can be heard at times in the Proponent's Proposed Project area, but are infrequent and not a significant noise source relative to traffic noise. Other sources of noise such as barking dogs, chain saws, and off-road vehicles are present in

[1] Monterey County General Plan, 1996

particular areas, but are not significant compared to noise produced by the transportation sources.

Sensitive Receptor Locations and Baseline Ambient Noise Levels

The Stone Cabin is listed as HR-8 in Section 4-10 Cultural Resources. It is located approximately 0.75 mile (3,960 feet, 1,207 meters) southwest of Site 4R at the closest point. The Stone Cabin is used as a remote recreational refuge by an ownership group of 10 individuals. The Jeep Trail (i.e., 4WD road) which serves the Stone Cabin would be improved to provide access above the Dam via Cachagua Road.

Additionally, in 1997, four residential locations nearest Proponent's Proposed Project activity areas were selected as representative sensitive noise receptors, as shown generally in Figure 4.8-1. Other nearby residential receptor locations not specifically evaluated would have similar or lesser project noise impacts. The four representative sensitive receptor locations are shown on the map as numbered below:

1. North bend in San Clemente Drive (Lot 11)

2. Residence off Center Court Place (Lot 10)

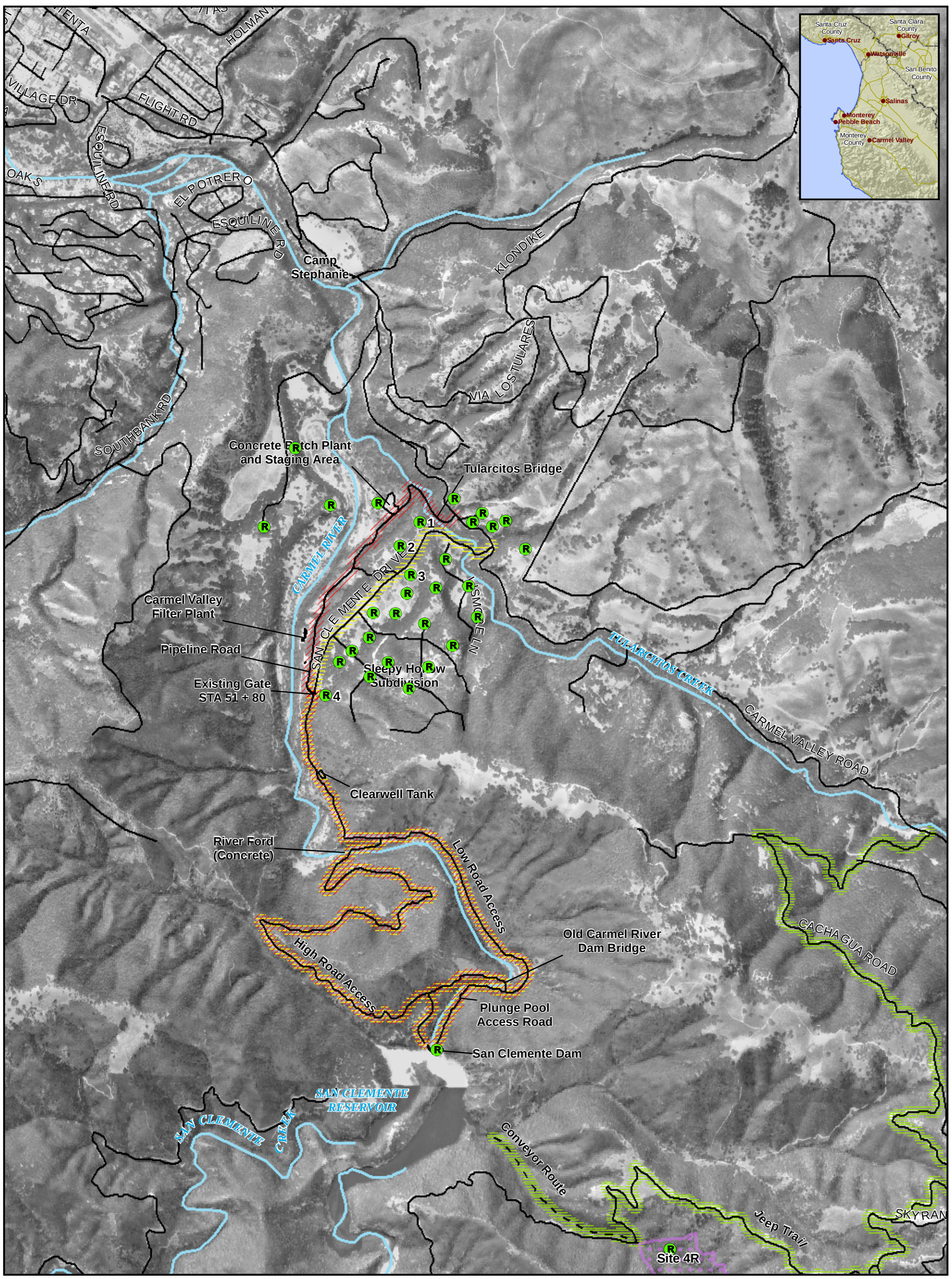
3. Residence above new intersection (Lot 9)

4. South end of San Clemente Drive (Lot 1)

In October 1997, ambient noise levels were monitored at the representative receptor locations. Existing noise levels recorded at each site are summarized in Table 4.8-2. Standard statistical noise descriptors were recorded at each receptor location. The L_{90} is the noise level exceeded 90 percent of the time, and is generally considered the background noise level. The L_{50} and L_1 are the noise levels exceed 50 percent and 1 percent of the time, respectively. The L_{eq} is the single noise level that has a noise energy equivalent to the overall varying noise monitored. The L_{dn} is the long-term average L_{eq}, with a night time "penalty" of 10 dBA, when noise levels are expected to be significantly lower. The L_{dn} was computed for each location using the field measurements, a standard model of hourly traffic distribution and an updated National Center for Highway Research traffic noise model.[2]

[2] Highway Research Board, 1971.

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Legend

Access Routes
- Cachugua / 4R
- Sleepy Hollow
- Tularcitos
- Sleepy Hollow / Tularcitos*

*Note: Sleepy Hollow and Tularcitos access routes share the same roads between the filter plant and the dam

- Stream
- Existing Road
- Proposed Road

- Sediment Disposal Site
- R Sensitive Receptor
  1. North Bend in San Clemente Drive (Lot 11)
  2. Residence off Center Court Place (Lot 10)
  3. Residence above new intersection (Lot 9)
  4. South end of San Clemente Drive (Lot 1)

Projection: California State Plane, Zone IV
Datum: NAD 83 Units: Feet

San Clemente Dam EIS/EIR

Figure 4.8-1

Sensitive Receptors Map

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Miles

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Table 4.8-2: Baseline Ambient Noise (dBA)[3]

Receptor Location	L_{90}	L_{50}	L_{eq}	L_1	L_{dn}
1. North bend in San Clemente Drive (Lot 11)	37	39	46	56	49
2. Residence off Center Court Place (Lot 10)	36	38	47	56	47
3. Residence above new intersection (Lot 9)	37	41	51	60	51
4. South end of San Clemente Drive (Lot 1)	36	38	46	58	46
Adjacent to Carmel Valley Road (reference, not a receptor)	41	44	58	70	57

Ambient noise levels in 1997 reflected the traffic characteristics at each location: nearby traffic volume, average speed, and distance to the nearest road. In these locations background noise levels are established by natural sounds such as birds and wind in the trees, and by traffic on Carmel Valley Road. Since Carmel Valley Road is the only arterial with significant traffic (approximately 120 trips per hour), noise levels decrease with distance from this road. However, the "background" noise level (L90) reflected a generally quiet ambient noise level (37 dBA). The L_{dn} levels were within land use compatibility standards, with the highest levels found adjacent to Carmel Valley Road.

2030 Baseline Conditions

Since the Proponent's Proposed Project area is a sparsely populated rural zone with larger parcels of land occupied by individual residences with limited additional development potential, there would be no anticipated potential for significant changes in the ambient background noise summarized in Table 4.8-2. Therefore, the 1997 baseline ambient noise levels are not expected the change significantly in the future out to the year 2030.

4.8.2 ENVIRONMENTAL RESOURCE IMPACT STANDARDS AND METHODS

Standards of Significance

In accordance with CEQA and County of Monterey land use compatibility standards for exterior community noise, a project impact would be significant if:

- Ambient noise levels in adjoining areas or in areas of sensitive receptors would increase substantially; or
- The proposed land uses are not compatible with ambient noise level standards.

Impact Assessment Methodology

The impact assessment utilizes estimates of project noise levels that are based on empirical calculations using literature-based noise source data and standardized calculations of noise attenuation with distance from the source. Since the complex nature of outdoor acoustics as affected by terrain and vegetation creates variability in

[3] The ambient noise levels computed fell in the "normally acceptable" range (Noise Range 1) of the Monterey County Land Use Compatibility Standards for residential uses.

noise levels at a given distance, the calculated noise levels associated with construction-related activities such as truck traffic and equipment operation may vary from those experienced during construction.

During the construction phase of the project, haul truck traffic noise level will vary depending on the quantities and frequency of trucks, which operate at any particular time. A maximum noise level for typical trucks in decibels (dBA) was correlated from industrial hygiene and noise measurement reference tables for characteristic industrial noise sources at reference distances.

Noise attenuation over distance from the alternative access roads was calculated on the basis of sound pressure level (SPL) converted to dB ("A" weighting, dBA). Sound pressure level (SPL, µbar, 0.1 N/m^2) attenuates with respect to the inverse distance law, where sound pressure is inversely proportional to the distance from the noise source. The decibel is defined as ten times the base 10 logarithm of the ratio between the two quantities of pressure squared, or:

$$SPL = 10 \log (p^2 / p_o^2) = 20 \log (p / p_o) \text{ dB}$$

where p is the sound pressure being measured and p_o is the reference sound pressure (in air 0.0002 µbar = 2×10^{-5} N/m^2, in water 0.00001 µbar = 1×10^{-6} N/m^2). This relationship is used to calculate attenuated noise levels for truck traffic at discrete distance intervals from the alternative access roads. Receptors range from about 60 to 600 meters in the receptor zone, with estimated attenuation shown in Table 4.8-3. At a sufficient distance from a particular noise source, with respect to intensity, noise becomes insignificant, particularly in complex, obstructed terrain covered with vegetation.

Table 4.8-3: Typical Noise Attenuation

Construction Equipment	Line-of-Sight Estimated Noise Level, dBA						
	15 m.	30 m.	60 m.	100 m.	150 m.	300 m.	600 m.
Dump Truck	91	85	79	75	71	65	59
Backhoe	85	79	73	69	65	59	53
Drilling Equipment Diesel Engines	100	94	88	84	80	74	68
Flatbed Truck	85	79	73	69	65	59	53
Pickup Truck	70	64	58	54	50	44	38
Tractor Trailer	85	79	73	69	65	59	53
Crane	85	79	73	69	65	59	53
Pumps	70	64	58	54	50	44	38
Welding Machine	72	66	60	56	52	46	40
City Street Traffic	80	74	68	64	60	54	48
Average for Truck Traffic	**87**	**81**	**75**	**71**	**67**	**61**	**55**

Table 4.8-4 shows that blasting noise at the dam site would not cause impacts due to the very long attenuation distance from the dam site to the receptor locations, 3900 to 5300 meters (see Figure 4.8-1). At these distances, transmitted noise would become insignificant, particularly in the complex obstructed terrain covered with vegetation.

Table 4.8-4: Typical Estimated Noise Impacts from Blasting

Activity	Line-of-Sight Estimated Noise Level, dBA						
	15 m.	1000 m.	2000 m.	3000 m.	4000 m.	5000 m.	6000 m.
Blasting (120 dBA)	120	84	78	74	71	70	68
Blasting (140 dBA)	140	104	98	94	91	90	88

In addition to the line-of-sight attenuation effects described above, the steep and convoluted terrain would cause construction noise to turn and bounce multiple times in order to reach a receptor. As noise turns or bounces in complex vegetated terrain, it is significantly reduced, typically 30 to 40 dBA.

Two aspects are important when considering potential noise impacts of a project: the increase in noise level, and the overall noise level produced. In terms of noise increases, persons exposed to an increase of 2 dBA or less would not notice the difference. Some persons exposed to increases of 3 to 4 dBA notice the increase in noise level, although the increase would not be serious. Noise increases of 5 dBA and above are very noticeable, and, if these are frequent incidents or continuous in nature, could represent a significant disturbance. Because of the existing low ambient levels in the Proponent's Proposed Project area, very noticeable short-term noise increases of 5 dBA or more could be produced by Proponent's Proposed Project activities.

4.8.3 IMPACTS AND MITIGATION

The following impacts have been defined for noise related activities:

- Issue NO-1: Dam Site Activities (noise from construction equipment and activity)
- Issue NO-2: Access Road Upgrades (noise generated during access road improvements)
- Issue NO-3: Project-Generated Traffic (noise from construction-related travel, including mobilization, materials, and workers)
- Issue NO-4: Concrete Batch Plant Operation (noise from operation of a new temporary stationary source)
- Issue NO-5: Sediment Disposal Site 4R Activities (noise from construction-related travel and activity)

Potential noise impacts associated with the seismic safety project would only occur during construction, would be intermittent and would not involve continuous noise sources, even during the primary construction period.

Proponent's Proposed Project

Impacts and mitigation measures for Noise Issue NO-5 (Sediment Disposal Site 4R Activities) do not apply to Proponent's Proposed Project.

Issue NO-1: Dam Site Activities

Noise from construction equipment and activity
Determination: ***significant, unavoidable, short-term***

IMPACT

Noise-generating activities associated with the Proponent's Proposed Project would cause temporary, short-term noise. Although most activities at the dam site would be audible and temporarily increase noise levels, they would not generate continuous noise. Because of their typically short duration, they would not affect the L_{dn} noise level.

The primary types of noise-generating construction activities that would occur in the area of the dam site include access road and bridge improvements; foundation preparation; parapet wall and spillway pier demolition; and concrete from construction and concrete pouring. These activities would involve the use of large diesel engine equipment, which produce noise levels of 75 to 85 dBA at 15 meters under full load. Jackhammers, if employed in the demolition phase, could produce noise levels of up to 90 dBA at 15 meters. A list of typical construction equipment and the associated noise levels is presented in Table 4.8-5, along with the "usage" level, or the portion of the time the equipment is generally used (that is, 0.4 means the equipment is used 40 percent of the time).[4]

No receptor areas would have a direct noise path and none are located in the vicinity of the Dam. Significant noise impacts would not occur due to the very long attenuation distance from the dam site to the receptor locations (3900 to 5300 meters; see Figure 4.8-1). At these distances, transmitted noise would likely become insignificant, particularly in complex terrain covered with vegetation. Residential noise levels in the Proponent's Proposed Project area, except for those adjacent to Carmel Valley Road, have existing L_{dn} noise levels below 50 dBA. Project noise sources of longer duration could temporarily increase the daily L_{dn}, but would rarely approach the 55 dBA limit considered acceptable for low-density residential use. Once the dam retrofit is complete, no long-term noise-generating activities would occur. However, given the sparsely populated rural nature of the area it cannot be determined with certainty that the impact will be less than significant.

MITIGATION

Standard measures such as limiting operations to normal daytime working hours to reduce noise nuisances would be routinely applied to construction activities near sensitive receptors and it is unlikely that dam site activities would have a significant noise impact. However, given the sparsely populated rural nature of the area it cannot be determined with certainty that the impact will be less than significant.

[4] U.S. EPA 1971

Table 4.8-5: Typical Ranges of Construction Equipment Noise Levels[5]

Equipment Type	Noise levels, dBA @ 15 m	Typical Usage
Mobile Equipment		
Front Loader	75–80	0.4
Backhoe	75–85	0.2
Bulldozer, tractors	75–85	0.4
Scraper	80–90	0.4
Grader	75–85	0.1
Truck	75–90	0.4
Paver	80–90	0.1
Materials Handling Equipment		
Concrete mixer	75–85	0.4
Concrete pump	75–80	0.4
Crane	75–85	0.2
Derrick	75–90	0.2
Stationary Equipment		
Pumps	70–75	1.0
Generators	75–80	1.0
Compressors	75–80	1.0
Saws	75–80	0.05
Impact Equipment		
Pile drivers	95–100	0.05
Jackhammers	75–90	0.1
Rock drills	80–100	0.05
Pneumatic tools	80–85	0.2

Issue NO-2: Access Road Upgrades

Noise generated during access road improvements
Determination: ***significant, unavoidable, short-term***

IMPACT

Road and bridge widening and improvement would generate noise transmitted from the following activities:

- Minor pruning and removal of some trees and underbrush. Gas engine chain saws typically produce sound levels of 82 to 87 dBA and would be used intermittently over a period of weeks.

- Delivery of aggregate materials and bridge building tasks. Diesel trucks produce noise levels of 80 to 85 dBA and would make several trips per day over a period of several months.

- Installing retaining walls along some embankments, by drilling holes and placing steel posts in concrete, to retain heavy wood timbers. This activity would require diesel equipment producing noise levels of 80 to 85 dBA for brief periods and would be completed within a few weeks.

[5] U.S. EPA 1971

- Widening and grading would require heavy machinery, such as small bulldozers, bobcats, backhoes, and diesel trucks. These have medium diesel engines and typically produce noise levels of 80 to 85 dBA under full load and 75 to 80 dBA while idling. This activity could occur sporadically at any particular location over a period of several months.

A summary of the typical intermittent conservative line-of-sight noise levels produced by road improvement activities at the representative receptors is presented in Table 4.8-6. Actual attenuated noise levels would likely be less than the calculated levels due to terrain and vegetation factors which would mitigate transmitted noise by approximately 3 to 7 dBA[6]. Resultant noise levels at some times at some locations may be above the normally acceptable range and/or more than 5 dBA above background. These instances would be transient and temporary. The noise exposures associated with road improvement would be very noticeable above the low background noise levels during several months of dam retrofit preparations. For comparison, a standard auto passby produces a maximum noise level of 55 to 65 dBA in the front yard of a residential property (15 meters). Thus, at some locations during road improvements, noise level increases could exceed that of a passing auto (or more than 5 dBA).

Table 4.8-6: Typical Estimated Road Improvement Noise

Receptor Location[7]	Estimated Noise Level, dBA
1. Lot 11 at north bend in San Clemente Drive (45 m)	60–70
2. Lot 10 residence off Center Court Place (60 m)	55–65
3. Lot 9 residence above new intersection (150 m)	55–65
4. Lot 1 at south end of San Clemente Drive (30 m)	70–80

Access roads and the OCRD Bridge could result in intermittent, short-term noise impacts for residential receptor areas shown in Figure 4.8-1 during daytime operations. Table 4.8-7 shows typical estimated attenuated noise levels at typical residential receptor distances from the prospective access routes (San Clemente Drive, Cachagua, Tularcitos) against a 37 dBA background (100 meters). The nearest receptor to an access route could receive about 75 dBA of equipment and traffic noise during daytime hours while the furthest receptor from an access route could receive about 55 dBA of equipment and traffic noise during daytime hours.

MITIGATION

Road construction and improvements would require contractor implementation of equipment maintenance and management practices to reduce construction-related noise. The following mitigation measures would be required to reduce this impact; however it may remain at a significant level for several weeks.

[6] Detailed terrain and vegetation attenuation analyses are beyond the scope of this study.
[7] The approximate distance to the road is in parentheses.

Table 4.8-7: Typical Estimated Short-term Intermittent Noise Impacts

Reference Level (15 meters)	Nearest Receptor (60 meters)	Furthest Receptor (600 meters)	Background Level (100 meters)
Attenuated noise level: 87 dBA	Attenuated noise level: 75 dBA	Attenuated noise level: 55 dBA	Attenuated noise level: 37 dBA

For off-road equipment:

- Use construction equipment that is of quiet design, has a high-quality muffler system, and is well maintained. This includes trucks used to haul materials. Examples of quiet-design construction equipment include the following:

    - For pile drivers: SPC Co. "Hush" models, Taywood Co. "Pilemaster" model, Dawson Co. "Quiet Piling Rig", for example.

    - For rock drills, mufflers have been developed by H.K. Porter and Acme Muffler. Both rock drill exhaust mufflers and body mufflers have been developed under contract to the U.S. Bureau of Mines Research Center. Pittsburgh Mining and Safety Research Center studies have shown that partial length constrained layer damping for drill steels is effective in reducing noise from drill bit vibration.

    - Install engine enclosure panels when required on stationary gas, diesel, or pump equipment.

    - Eliminate unnecessary idling of machines when not in use.

    - Use good maintenance and lubrication procedures to reduce operating noise.

    - Timing restrictions (i.e., daytime operations only) would be applied to construction activities in and near the concrete batch plant and staging site and access to and from this site from Carmel Valley Road via San Clemente Drive and Center Court Place.

For on-road vehicles:

- Passenger vehicle (including van pools) access for construction workers would be limited to between 7:00 a.m. and 7:00 p.m. Monday through Saturday during the construction season (typically April through October).

- Truck deliveries of construction material and equipment to the batch plant and from the batch plant to the Dam, and construction activities and equipment operation in and around the batch plant would be limited to between 8:00 a.m. and 6:00 p.m. Monday through Saturday during the construction season (typically April through October).

- Enforce California Vehicle Code prohibitions against faulty or modified loud vehicle exhaust systems (Sections 27150 and 27151).[8]

- Post low speed limits (15 mph as stated in the air quality section) on the unpaved access roads, not only to reduce noise levels and dust, but also to maintain safe operation conditions.

These mitigation measures would reduce the impacts of noise generated during access road improvements. Although the impacts will be transient and temporary, it is difficult to say with certainty that the mitigation measures will reduce the short-term impacts to less than significant.

Issue NO-3: Project-Generated Traffic

Noise from construction-related travel, including mobilization, materials, and workers
Determination: ***significant, unavoidable, short-term***

IMPACT

Typical project-generated traffic would be comprised of material delivery trucks, concrete-mixing trucks, and construction worker vehicles traveling to and from the site. Large diesel trucks would be employed to deliver aggregate, sand and concrete to the mixing plant site, as well as equipment to the dam site. These trucks have large diesel engines and produce noise levels of 75 to 80 dBA under full load and 70 to 75 dBA while idling (30 meters). An estimated 20 truck trips per day, with a maximum of about 4 trips per hour, would be expected under typical conditions.[9]

During dam construction, diesel concrete mixing trucks would pick up loads at the batch plant and deliver them to the dam site, creating noise levels of 70 to 80 dBA at 30 meters. Under peak conditions approximately 50 trips per day, or about 6 trips per hour, could travel the road.[10]

Construction worker vehicles traveling to and from the dam site include standard gas-engine cars, pickups and vans, producing noise levels of 55 to 65 dBA at 15 meters. The number of worker trips to and from the mixing plant or dam site is estimated to be about 90 per day, with about 25 to 30 in the morning and evening peak hours.[11]

Receptors for noise transmitted from project-generated car and truck trips to the dam site are described below for each route segment shown generally in Figure 4.8-1:

- On Carmel Valley Road to San Clemente Drive, receptors include several residential properties adjacent to the Carmel Valley Road.

[8] Vehicles with poorly muffled unmuffled or modified engine or exhaust systems that cause excessive noise can be cited by any peace officer according to this code.
[9] Woodward-Clyde, October 1997 and Higgins & Associates, 1998, also MWH, 2005.
[10] Woodward-Clyde, October 1997 and Higgins & Associates, 1998.
[11] Woodward-Clyde, October 1997 and Higgins & Associates, 1998.

- On the Tularcitos Creek Access Route connection, receptors include residential properties on San Clemente Drive, particularly those near the entrance to Center Court Place.

- On the improved access road from new batch mixing plant location past filter plant, receptors include residential properties on San Clemente Drive, particularly those from the entrance to Center Court Place and Lot 1 at end of San Clemente Drive.

- On the improved access road from the extension of San Clemente Drive via the higher access road to the Dam, receptors include residential properties at the south end of San Clemente Drive.

Table 4.8-8 summarizes typical conservative line-of-sight noise levels due to various types of traffic on nearby properties at different sections of the access route. Actual attenuated noise levels would likely be less than the calculated levels due to terrain and vegetation factors which would mitigate transmitted noise by approximately 3 to 7 dBA[12]. Resultant noise levels at some times at some locations may be above the normally acceptable range and/or more than 5 dBA above background. These instances would be transient and temporary. Except for the receptors adjacent to Carmel Valley Road at road level, sensitive receptors would be protected not only by distance, but also by steep terrain and vegetation.

Table 4.8-8: Typical Estimated Project-Generated Traffic Noise

Receptor Location[13]	Worker Trips to the Dam (30/hr max), dBA	Truck Trips to Plant/Dam (6/hr max), dBA
1. Lot 11 at north bend in San Clemente Drive (45 m)	47–57	62–77
2. Lot 10 residence off Center Court Place (60 m)	40–50	60–75
3. Lot 9 residence above new intersection (30 m)	50–60	65–80
4. Lot 1 at south end of San Clemente Drive (30 m)	50–60	65–80

Since background levels are relatively low in the area away from Carmel Valley Road, new truck traffic passing the road several times per hour would be very noticeable, producing noise levels of up to 80 dBA at some receptors. Worker vehicles would be noticeable, but to a much lesser extent. For comparison, a standard auto passby would create a maximum noise level of 55 to 65 dBA in the front yard of a residential property, 15 meters from the road. In summary, most project-generated worker trips would produce lower noise levels than a typical auto passby due to lower speeds that would be required on the access roads during the course of the Proponent's Proposed Project. The noise produced by construction workers' vehicles would not cause a significant noise impact, however material delivery trucks and concrete mixing trucks would result in significant noise impacts.

[12] Detailed terrain and vegetation attenuation analyses are beyond the scope of this study.
[13] The approximate distance to project traffic is in parentheses.

MITIGATION

Mitigation for issue NO-2 (Access Road Upgrades) would also mitigate Impact NO-3 (Project-Generated Traffic). These mitigation measures would reduce the impacts of noise from construction related travel. Although the impacts would be transient and temporary, it is difficult to say with certainty that the mitigation measures can reduce the short-term impacts to less than significant.

Issue NO-4: Concrete Batch Plant Operation

Noise from operation of a new temporary stationary source
Determination: ***significant, unavoidable, short-term***

IMPACT

The concrete to be used for thickening and reinforcing SCD would be mixed at a small temporary batch plant to be constructed in an open area at the bend in the access road approximately a half mile northeast of the existing filter plant. Because of the proximity to at least two Sleepy Hollow properties, Proponent's Proposed Project activities occurring in the concrete mixing plant area potentially could cause construction noise disturbances. The activities occurring in the mixing plant area would be:

- Material loading into plant conveyors would involve the use of diesel engine loaders, producing short-term, intermittent noise levels of 70 to 80 dBA at 15 meters.

- Batch plant mixing operations would include various types of hoppers, conveyors, and motors to load and mix aggregate sand and cement. This stationary equipment produces noise levels to 70 to 78 dBA at 30 meters. This could be a relatively steady noise during days that concrete is being delivered to the site.

- Diesel trucks would deliver aggregate, sand and dry concrete to the mixing plant and also mixing trucks would deliver concrete to the dam site. The truck noise would occur several times per hour. (The noise impacts from trucks delivering materials to the plant and trucks delivering concrete to the Dam were considered in Issue NO-3.)

A summary of typical batch plant conservative line-of-sight noise levels at the affected receptor areas are presented in Table 4.8-9. Actual attenuated noise levels would likely be less than the calculated levels due to terrain and vegetation factors which would mitigate transmitted noise by approximately 3 to 7 dBA[14]. Resultant noise levels at some times at some locations may be above the normally acceptable range and/or more than 5 dBA above background, however, these instances would be significant and unavoidable would be short-term in nature.

[14] Detailed terrain and vegetation attenuation analyses are beyond the scope of this study.

Table 4.8-9: Typical Estimated Concrete Batch Plant Noise

Receptor Location[15]	Plant Noise, dBA
1. Lot 11 at north bend in San Clemente Drive (45 m)	55–60
2. Lot 10 residence off Center Court Place (60 m)	53–58
3. Lot 9 residence above new intersection (30 m)	Near Background
4. Lot 1 at south end of San Clemente Drive (30 m)	Near Background

The receptors that could be disturbed by plant noise would be limited to properties on San Clemente Drive that are within about 150 meters of the plant, a total of two lots. Both would be partly protected by terrain and vegetation attenuation, so there would be no actual direct noise transmission path (line-of-sight) between the plant and the property. Plant noise would often be audible above the ambient noise, but it would generally be low enough not to be considered intrusive. The analysis above shows that the resulting receptor noise levels when the plant is operating would fall within the Monterey County "Normally Acceptable" standard between 50 and 60 dBA for the closest locations, and would be lower at all other receptor locations.

Traffic and batch plant noise would not additively increase the severity of the impacts of either one alone. Since neither source of noise is steady and consistent, nor do the two have the same character or sound level, they would not be additive. Whichever noise is the loudest at the time or closest to a given receptor would be noticeable within the noise level ranges stated in this chapter.

MITIGATION

The batch plant would be quieted by the installation of sound damped conveyors and equipment enclosures, as well as fitting exhaust manifolds with high quality mufflers. Aggregate material piles at the batch plant site would be arranged to protect receptor locations. Wherever possible, materials would be piled to act as noise berms between residential locations and the truck and mixing plant noise sources.

- For the four sensitive receptor locations (Lots 1, 9, 10, and 11), periodically monitor noise generated by batch plant operation to determine actual noise levels and significance of impacts.

- The mitigation measures will minimize the short-term impacts associated with NO-4 (Concrete Batch Plant Operation) but it is difficult to say with certainty that the mitigation measures can reduce the short-term impacts to less than significant.

Alternative 1 (Dam Notching)

Impacts and mitigation measures for Noise Issues NO-2 (Access Road Upgrades), NO-3 (Project-Generated Traffic), and NO-4 (Concrete Batch Plant Operation) would be the same as the Proponent's Proposed Project.

[15] The approximate distance to the batch plant is in parentheses.

Issue NO-1: Dam Site Activities

Noise from construction equipment and activity
Determination: ***significant, unavoidable, short-term***

IMPACT

Impacts from dam notching and sediment disposal would be similar in most respects to those caused by the activities characterized for the Proponent's Proposed Project. Blasting may be used to break up large concrete pieces. At the dam site, blasting would cause brief intermittent noise impacts of a few seconds duration in the range of 120 to 140 dBA at 15 meters.[16,17]

MITIGATION

Noise generated at the Dam and sediment disposal sites, including blasting, would be attenuated by the very long distance to the receptor locations (3,900 to 5,300 meters) and by local terrain, as discussed above. Blasting would be restricted to daytime operations, between 8:00 a.m. and 6:00 p.m. Monday through Saturday during the construction season (typically April through October). The blasting schedule would be communicated to local residents.

Standard measures such as limiting operations to normal daytime working hours to reduce noise nuisances would be routinely applied to construction activities near sensitive receptors and it is unlikely that dam site activities would have a significant noise impact. However, given the sparsely populated rural nature of the area it cannot be determined with certainty that the impact will be less than significant.

Issue NO-5: Sediment Disposal Site 4R Activities

Noise from construction related travel and activity
Determination: ***significant, unavoidable, short-term***

IMPACT

The Stone Cabin is located approximately 0.75 miles (3,960 feet, 1,207 meters) southwest of Site 4R at the closest point. A 700 foot (213 meter) high ridge separates the Stone Cabin from Site 4R at the closest point. Thus, there is no direct line-of-sight from Site 4R to the Stone Cabin. Since there is no direct line-of-sight, noise from Site 4R would be deflected and attenuated by the interceding ridge. This spatial relationship would significantly reduce noise impacts on the Stone Cabin. As shown on the map, traffic on the improved Site 4R access road would not traverse the last mile (1,609 meters) of Jeep Trail beyond Site 4R.

Typical project-generated traffic noise at Site 4R would be comprised of trucks and equipment with large diesel engines and produce estimated noise levels of 75 to 85 dBA under full load and 70 to 80 dBA while idling (30 meters).

[16] Barbara A. Plog, Ed. 1988. Fundamentals of Industrial Hygiene 3rd Edition. National Safety Council, Table 9-b, page 168
[17] Bruel & Kjaer, 1971, Acoustic Noise Measurements, Figure 2-10, page 20.

Table 4.8-10 shows typical estimated attenuated noise levels at the Stone Cabin from the proposed Site 4R activity against an estimated 40 dBA or less background[18].

Table 4.8-10: Typical Estimated Short-term, Intermittent Noise Impacts

Reference Level (15 meters)	Straight Line (1200 meters)	Complex Terrain (1200 meters)	Background Level (1200 meters)
Attenuated noise level: 87 dBA	Attenuated noise level: 49 dBA	Attenuated noise level: 34 dBA	Attenuated noise level: ≤40 dBA[19]

Impacts from transmitted noise from Site 4R to the Stone Cabin would become insignificant due to absorption by the complex terrain covered with vegetation which intercedes between Site 4R and the Stone Cabin. As shown in Table 4.8-10, the actual complex terrain attenuated noise transmission from Site 4R to the Stone Cabin is estimated to be 34 dBA compared to 49 dBA estimated for straight line attenuation. The estimated complex terrain attenuated value is less than estimated background at the Stone Cabin; however, given the sparsely populated rural nature of the area it cannot be determined with certainty that the impact will be less than significant.

MITIGATION

Standard measures such as limiting operations to normal daytime working hours to reduce noise nuisances would be routinely applied to construction activities near the Stone Cabin and it is unlikely that sediment disposal site activities would have a significant noise impact. However, given the sparsely populated rural nature of the area it cannot be determined with certainty that the impact will be less than significant.

Alternative 2 (Dam Removal)

Impacts and mitigation measures for Noise Issues NO-1 (Dam Site Activities), NO-2 (Access Road Upgrades) and NO-3 (Project-Generated Traffic) would be the same as the Proponent's Proposed Project. Issue NO-4 (Concrete Batch Plant Operation) would not apply. Issue NO-5 (Sediment Disposal Site 4R Activities) would be the same as Alternative 1.[20]

Alternative 3 (Carmel River Reroute and Dam Removal)

Impacts and mitigation measures for Noise Issues NO-1 (Dam Site Activities), NO-2 (Access Road Upgrades) and NO-3 (Project-Generated Traffic) would be the same as

[18] Barbara A. Plog, Ed. 1988. Fundamentals of Industrial Hygiene 3rd Edition. National Safety Council, Table 9-b, page 168

[19] Barbara A. Plog, Ed. 1988. Fundamentals of Industrial Hygiene 3rd Edition. National Safety Council, Table 9-b, page 168

[20] Noise generated at the Dam and sediment disposal sites, including blasting, would be attenuated by the very long distance to the receptor locations (3,900 to 5,300 meters) and by local terrain, as discussed above. Blasting would be restricted to daytime operations, between 8:00 a.m. and 6:00 p.m. Monday through Saturday during the construction season (typically April through October). The blasting schedule would be communicated to local residents.

the Proponent's Proposed Project. Issue NO-4 (Concrete Batch Plant Operation) and Issue NO-5 (Sediment Disposal Site 4R Activities) would not apply.[21]

Alternative 4 (No Project)

There are no construction activities associated with the No Project Alternative; therefore there would be no additional noise beyond baseline conditions.

[21] Noise generated at the Dam and sediment disposal sites, including blasting, would be attenuated by the very long distance to the receptor locations (3900 to 5300 meters) and by local terrain, as discussed above. Blasting would be restricted to daytime operations, between 8:00 a.m. and 6:00 p.m. Monday through Saturday during the construction season (typically April through October). The blasting schedule would be communicated to local residents.

4.9 TRAFFIC AND CIRCULATION

This section describes the potential impacts of the San Clemente Seismic Safety Project on the traffic and transportation related conditions in the Project Area. Traffic and transportation related conditions include regional and local roadways and existing traffic operating conditions influenced by the project. In the response to comments, additional information is provided in the Final EIR/EIS which clarifies and amplifies the information included in this Draft EIR/EIS. This environmental setting section was prepared using information developed from the documents provided by the RDEIR (Denise Duffy & Associates 2000).

4.9.1 ENVIRONMENTAL SETTING

This section describes the regional and local roadways that serve the project site and existing traffic operating conditions.

Existing Roadway System

San Clemente Drive

SCD is currently accessed from Carmel Valley Road via San Clemente Drive, a gated private road that extends from Carmel Valley Road through the Sleepy Hollow Subdivision. San Clemente Drive also provides access to the CVFP which is located adjacent to the Carmel River west of the Sleepy Hollow Subdivision. San Clemente Drive is a paved hard-surfaced road between Carmel Valley Road and a locked gate that prevents public access to the reservoir. From this locked gate on CAW property, San Clemente Drive is a one-lane unpaved roadway with turnouts to the junction of the upper and lower dam roads 3,100 feet south of the gate.

Carmel Valley Road

Carmel Valley Road extends between Highway 1 and Arroyo Seco Road west of Greenfield. It is a two-lane rural highway except for a four-lane divided section between Carmel Rancho Boulevard and Via Petra Way. Carmel Valley Road west of Laureles Grades has 12 foot travel lanes and shoulders minimally six feet in width. East of Laureles Grade, shoulder widths narrow. Through Carmel Valley Village, Carmel Valley Road is designed with twelve-foot travel lanes with two- to four-foot shoulders. Numerous driveways exist through the Village and the speed limit is 25 miles per hour.

East of Carmel Valley Village, the shoulder widths vary from two to eight feet. The road in certain areas is extremely winding. Near the project site, a speed limit is not posted, but prevailing vehicle speeds are generally less than 30 miles per hour. At the intersection with San Clemente Drive, one travel lane is provided in each direction on Carmel Valley Road and the travel lanes are approximately 12 feet in width. Striped shoulders are not provided on this section of Carmel Valley Road.

Cachagua Road

Cachagua Road is a two-lane rural road that traverses mountainous terrain with narrow pavement widths and minimal shoulders. It intersects Carmel Valley Road about 2 miles east of San Clemente Drive and it provides access to the Cachagua area of Monterey County. Cachagua Road is generally 18 to 20 feet wide, although there are sections that are not as wide.

A corner sight distance of approximately 400 feet is currently provided to the west from the Cachagua Road approach to Carmel Valley Road. The corner sight distance to the east at this location is about 225 feet. These measurements are taken from a driver's position on the Cachagua Road approach to Carmel Valley Road that is about 13 feet back from the edge of the eastbound travel lane. Corner sight distance measurements taken from a position closer to Carmel Valley Road would yield longer corner sight distance.

Vehicle speeds were observed on Carmel Valley Road at Cachagua Road and the prevailing speed is about 40 miles per hour in each direction. Based upon the stopping distance formula published by the American Association of State Highway and Transportation Officials (AASHTO 2007) a minimum corner sight distance of 295 feet looking west and 310 feet looking east should be provided at the Carmel Valley Road/Cachagua Road intersection. With a sight distance of approximately 225 feet provided to the east, the sight distance deficiency is approximately 85 feet. With an existing sight distance of approximately 400 feet looking to the west, the sight distance looking to the west from Cachagua Road is adequate.

State Route 1

SR 1 provides regional access and circulation functions in Monterey County. SR 1 is two lanes wide (1 lane each way) south of Ocean Avenue and 4 lanes wide north of Ocean Avenue. Traffic movements at the intersection of Highway 1 and Carmel Valley Road are controlled by a fully actuated traffic signal.

State Route 68

SR 68 can be accessed from Carmel Valley Road via Laureles Grade, a two-lane rural highway. SR 68 is a State highway connecting the Monterey Peninsula with Salinas and the Salinas Valley. It has a predominately east-west orientation. It is a four-lane freeway for the first one-half mile east of SR 1. Four travel lanes are also provided east of Toro Park. Two lanes are provided for approximately 10 miles between these four lane segments.

Laureles Grade

Between Carmel Valley Road and SR 68, Laureles Grade has a long, uphill grade in the northbound direction from Carmel Valley Road towards Highway 68. This is followed by a long downhill grade in the northbound direction on its approach to Highway 68.

Twelve-foot wide travel lanes and two- to six-foot wide shoulders are provided along Laureles Grade. The road is extremely winding along most of its length.

Jeep Trail

The Jeep Trail is an unimproved private dirt road that is used to access the San Clemente Open Space and an 18-acre privately owned parcel located off of Cachagua Road. The Open Space is owned and managed by the Monterey Peninsula Regional Park District (MPRPD) and is not currently open to visitors. The 18-acre parcel is used for recreational purposes by its owners. Access to the Jeep Trail is controlled by a locked Park District gate located near Cachagua Road. Therefore, current usage of the Jeep Trail by motor vehicles is low and not frequent.

Existing Traffic Volumes and Traffic Operations

Road Segment Daily Traffic Volumes and Level of Service

CARMEL VALLEY ROAD

Table 4.9-1 identifies existing daily traffic volumes and Level of Service for various segments of Carmel Valley Road and SR 1. The road segments subject to Carmel Valley Master policies are identified in Table 4.9-1 with a segment number between 1 and 12.

The Carmel Valley Master Plan divides Carmel Valley Road from Highway 1 through Carmel Valley Village into 10 segments. Three segments of Carmel Valley Road currently exceed threshold levels established in the Carmel Valley Master Plan. These segments are as follows:

Segment 3: Laureles — Ford	12,073 vpd	[1]LOS E
Segment 6: Schulte — Robinson	15,514 vpd	[1]LOS E
Segment 7: Rancho San Carlos — Schulte	17,012 vpd	[1]LOS E

Notes
[1]LOS=Level of Service

The other Carmel Valley Road segments that are subject to the policies of the Carmel Valley Master Plan operate at or better than the maximum level of service allowed by the Carmel Valley Master Plan.

CARMEL RANCHO BOULEVARD AND RIO ROAD

Carmel Rancho Boulevard and Rio Road (Segments 11 and 12) are also subject to the policies of the Carmel Valley Master Plan. These segments currently operate at LOS B.

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Table 4.9-1: Road Segment Volumes and Levels of Service

NO.	ROAD SEGMENT DESCRIPTION	LEVEL OF SERVICE THRESHOLD 24-HOUR VOLUME	LOS	EXISTING VOLUMES ADT	LOS	PROJECT TRAFFIC DISTRIBUTION	EXISTING PLUS PROPONENT'S PROPOSED PROJECT PROPOSED PROJECT TRIPS	TOTAL EXISTING + PROJECT VOLUMES	LOS	EXISTING PLUS ALTERNATIVE 1 ALT 1 TRIPS	TOTAL EXISTING + ALT 1 VOLUMES	LOS	EXISTING PLUS ALTERNATIVE 2 ALT 2 TRIPS	TOTAL EXISTING + ALT 2 VOLUMES	LOS	EXISTING PLUS ALTERNATIVE 3 ALT 3 TRIPS	TOTAL EXISTING + ALT 3 VOLUMES	LOS	EXISTING PLUS NO PROJECT NO PROJECT TRIPS	TOTAL EXISTING + NO PROJECT VOLUMES	LOS
A. CARMEL VALLEY ROAD																						
	East of Cachagua	N/A	N/A	2,100	B	5%	20	2,120	B	14	2,114	B	12	2,112	B	8	2,108	B	0	2,100	B
1.	Holman – Cachagua	8,487	D	4,208	D	95%	372	4,580	D	266	4,474	D	228	4,436	D	152	4,360	D	0	4,208	D
2a.	Esquiline – Holman	6,835	C	4,341	C	95%	372	4,713	C	266	4,607	C	228	4,569	C	152	4,493	C	0	4,341	C
2b.	Ford – Esquiline	N/A	D	8,984	D	90%	353	9,337	D	252	9,236	D	216	9,200	D	144	9,128	D	0	8,984	D
3.	Laureles – Ford	11,600	D	**12,073**	E	80%	314	**12,387**	E	224	**12,297**	E	192	**12,265**	E	128	**12,201**	E	0	**12,073**	E
5.	Robinson – Laureles	12,752	D	11,947	D	80%	314	12,261	D	224	12,171	D	192	12,139	D	128	12,075	D	0	0	11,947
6.	Schulte – Robinson	15,499	D	**15,514**	E	80%	314	**15,828**	E	224	**15,738**	E	192	**15,706**	E	128	**15,642**	E	0	**15,514**	E
7.	Rancho San Carlos – Schulte	16,340	D	**17,012**	E	78.5%	308	**17,320**	E	220	**17,232**	E	188	**17,200**	E	126	**17,138**	E	0	0	**17,012**
8.	Rio – Rancho San Carlos	48,487	C	21,892	A	75%	294	22,186	A	210	22,102	A	180	22,072	A	120	22,012	A	0	0	21,892
9.	Carmel Rancho – Rio	51,401	C	25,632	A	75%	294	25,926	A	210	25,842	A	180	25,812	A	120	25,752	A	0	0	25,632
10.	Highway – Carmel Rancho	27,839	E	24,404	E	70%	274	24,678	E	196	24,600	E	168	24,572	E	112	24,516	E	0	0	24,404
B. CARMEL RANCHO BOULEVARD																						
11.	Carmel Valley – Rio	33,495	C	10,901	B	2.5%	10	10,911	B	7	10,908	B	6	10,907	B	4	10,905	B	0	10,901	B
C. RIO ROAD																						
12.	**Carmel Rancho – Highway 1**	33,928	C	15,179	B	2.5%	10	15,189	B	7	15,186	B	6	15,185	B	4	15,183	B	0	15,179	B
D. SR 1																						
	North of Carmel Valley Rd	N/A	N/A	53,000	F	70%	274	53,274	F	196	53,196	F	168	53,168	F	112	53,112	F	0	53,000	F
	South of Carmel Valley Rd	N/A	N/A	30,000	F	2.5%	10	30,010	F	7	30,007	F	6	30,006	F	4	30,004	F	0	30,000	F
E. CACHAGUA ROAD																						
	Carmel Valley – Jeep Road	N/A	N/A	760	C	(See Note 5.)	0	760	C	266	1,026	C	228	988	C	152	912	C	0	760	C

NOTES:

LOS: Level of Service
ADT: Average Daily Traffic
N/A: Not applicable
Numbers in bold exceed Carmel Valley Road Master Plan threshold volume
Cachagua Rd Distribution:
Project = 0%
Alt 1 = 70%
Alt 2 = 100%
Alt 3 = 100%
No Project = 0%

STATE ROUTE 1

According to Caltrans statistics, SR 1 north of Carmel Valley Road carried 53,000 vehicles per day (vpd) and SR 1 south of Carmel Valley Road carried 30,000 vpd in 2004. Based on planning level of service threshold volumes, these links currently operate at LOS F.

SAN CLEMENTE DRIVE

San Clemente Drive currently carries an estimated 140 vehicles per day. Residential streets typically carry low volumes of traffic such that the traffic load does not meet or exceed the street capacity. Quality of life for residents is more important than street capacity in assessing impacts to residential streets.

Based on criteria provided in the literature, the following daily traffic volume thresholds provide a basis to assess the relationship between traffic volume and quality of life for residential streets:

Average Level of Service	Daily Traffic
A	1,200
B	1,400
C	1,600
D	1,800
E	2,000
F	>2,000

Currently, San Clemente Drive operates at the low end of LOS A.

CACHAGUA ROAD

The existing daily traffic volume and level of service for Cachagua Road are listed in Table 4.9-1. According to statistics published by Monterey County, Cachagua Road south of Carmel Valley Road carried an average of 760 per day in 2004 (MCDPWTE 2004). The segment between Carmel Valley Road and the Jeep Access Road currently operates at LOS C. Traffic volumes on Cachagua Road are relatively low and the LOS C operating condition is primarily due to the extended 11 percent grade extending in the southbound direction from Carmel Valley Road.

Intersection Traffic Volumes and Level of Service

CARMEL VALLEY ROAD/SAN CLEMENTE DRIVE

AM and PM peak period intersection turning movement counts were conducted at the Carmel Valley Road/San Clemente Drive intersection on Wednesday March 23, 2005. On this day, Carmel Valley Road west of San Clemente Drive carried 191 vehicles per hour (vph) during the AM peak hour and 205 vph during the PM peak hour. The existing AM and PM peak hour volumes were adjusted based on seasonal traffic volume statistics published by the Monterey County Public Works Department. The existing intersection volumes were increased by 9 percent to adjust the volumes to account for

seasonal variations in traffic volumes. The adjusted existing AM and PM peak hour volumes are shown in Figure 4.9-1.

Based on technical procedures documented in the 2000 Highway Capacity Manual (HCM), the Carmel Valley Road/San Clemente Drive intersection currently operates at LOS A during both peak hours. The existing AM and PM peak hour intersection levels of service are summarized in Table 4.9-2.

CARMEL VALLEY ROAD/CACHAGUA ROAD

AM and PM peak period intersection turning movement counts were conducted at the Carmel Valley Road/Cachagua Road intersections on Thursday March 24, 2005. On these days, Carmel Valley Road west of San Clemente Drive carried 191 vehicles per hour (vph) during the AM peak hour and 205 vph during the PM peak hour. The existing AM and PM peak hour volumes were adjusted based on seasonal traffic volume statistics published by the Monterey County Public Works Department. The existing intersection volumes were increased by 9 percent to adjust the volumes to account for seasonal variations in traffic volumes. The adjusted existing AM and PM peak hour volumes are shown in Figure 4.9-1.

Based on technical procedures documented in the 2000 Highway Capacity Manual, the Carmel Valley Road/Cachagua Road intersection currently operates at LOS A during both peak hours. The existing AM and PM peak hour intersection levels of service are summarized in Table 4.9-2.

Figure 4.9-1: Existing AM and PM Peak Hour Intersection Volumes

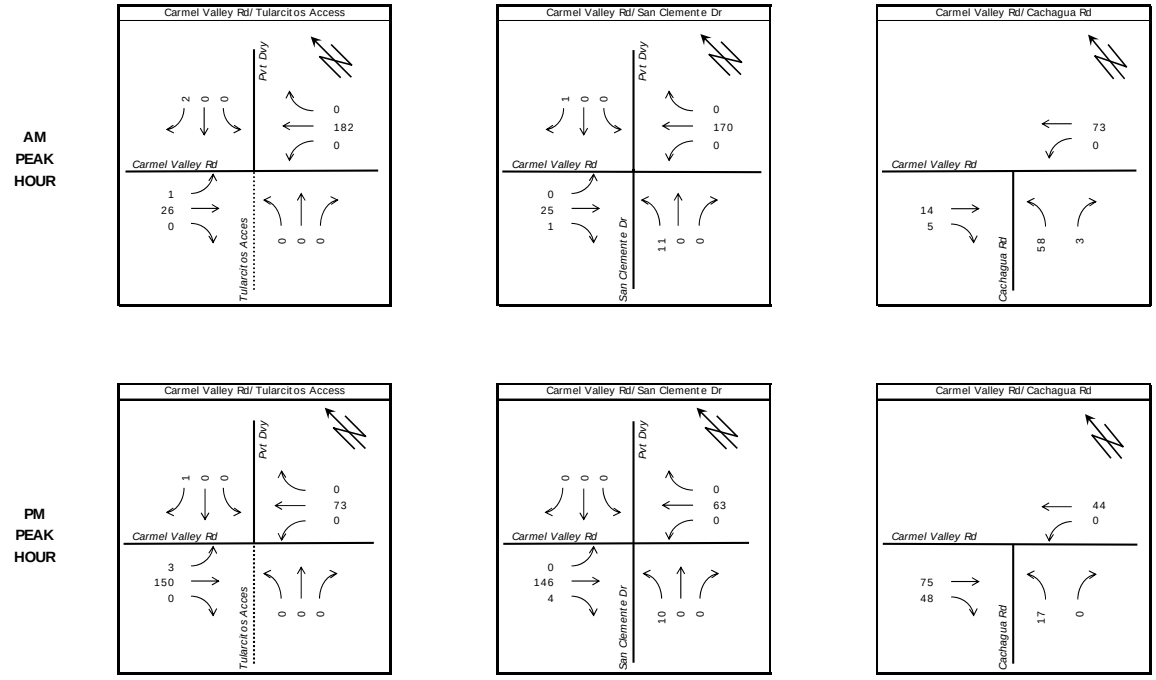


Table 4.9-2: Intersection Levels of Service

	N-S Road	E-W Road	Existing Lane Configuration	Existing Intersection Control	LOS Standard	Existing Conditions				Existing Plus Proponent's Proposed Project				Existing Plus Alternative 1				Existing Plus Alternative 2				Existing Plus Alternative 3			
						AM Peak Hr		PM Peak Hr		AM Peak Hr		PM Peak Hr		AM Peak Hr		PM Peak Hr		AM Peak Hr		PM Peak Hr		AM Peak Hr		PM Peak Hr	
						Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1	Private Dvwy/ Tularcitos Access Road (Future)	Carmel Valley Road	EB 1-L/T	Stop Sign (SB)	C	0.1	A	0.1	A	0.6	A	1.1	A	0.1	A	1.1	A	0.1	A	0.1	A	0.1	A	0.1	A
			WB 1-T/R	Northbound Approach		–	–	–	–	10.4	B	10.5	B	–	–	–	–	–	–	–	–	–	–	–	–
			SB 1-L/R	Southbound Approach		9.5	A	8.7	A	9.5	A	8.7	A	9.5	A	8.9	A	9.5	A	8.9	A	9.5	A	8.8	A
2	San Clemente Drive	Carmel Valley Road	EB 1-L/T/R	Stop Sign (NB & SB)	C	0.6	A	0.4	A	0.6	A	0.4	A	0.5	A	0.4	A	0.5	A	0.4	A	0.5	A	0.4	A
			WB 1-L/T/R	Northbound Approach		10.3	B	9.9	A	10.3	B	9.9	A	10.8	B	10.5	B	10.7	B	10.4	B	9.9	A	10.2	B
			SB 1-L/T/R	Southbound Approach		9.4	A	0.0	A	9.4	A	0.0	A	9.5	A	0.0	A	9.4	A	0.0	A	9.1	A	0.0	A
			NB 1-L/T/R									4.9	A												
3	Cachagua Road	Carmel Valley Road	EB 1-T/R	Stop Sign (NB)	C	3.7	A	0.9	A	3.7	A	0.9	A	3.4	A	2.3	A	3.3	A	2.2	A	3.4	A	1.6	A
			WB 1-L/T	Northbound Approach		9.3	A	9.4	A	9.3	A	9.5	A	9.6	A	9.8	A	9.5	A	9.8	A	9.4	A	9.6	A
			NB 1-L/R	Southbound Approach																					

NOTES:

1. L, T, R = Left, Through, Right
2. Nb, Sb, Eb, Wb = Northbound, Southbound, Eastbound, Westbound
3. Wa = Worst Approach
4. * = Delay Greater Than 300 Seconds
5. N/A = Not Applicable. With Recommended Improvement At This Intersection Under This Scenario, The Intersection Will No Longer Exist.

Accident Rates

CARMEL VALLEY ROAD

Table 4.9-3 provides a summary of traffic accidents that have occurred on Carmel Valley Road between 2002 and 2004. Accidents for 2004 are also summarized separately. For each road segment, accident rates are calculated as the number of accidents per million vehicle-miles of travel. Expected accident rates based on average statewide accident data compiled by Caltrans is also provided in Table 4-9.3.

Between 2002 and 2004, accident rates exceeded the statewide average for roadways of similar type on Carmel Valley Road between mileposts 5.70 and 6.26. Carmel Valley Road between mileposts 5.70 and 6.26 is the segment of road at the Mid-Valley Shopping Center. About one-half of these accidents occurred at the Doris Drive intersection. When the intersection related accidents at Doris Drive are removed from the calculation, the accident rate for the segment falls below the expected accident rate for the segment.

Accident rates in 2004 are similar to the 2002 to 2004 conditions. In 2004, the accident rate on the segment of Carmel Valley Road between the Mid-Valley Shopping Center and Laureles Grade exceeded the expected average accident rate for that segment.

CACHAGUA ROAD

Table 4.9-3 provides a summary of traffic accidents that have occurred on Cachagua Road between 2002 and 2004. Accidents for 2004 are also summarized separately. For each road segment, accident rates are calculated as the number of accidents per million vehicle-miles of travel. Expected accident rates based on average statewide accident data compiled by Caltrans are also provided in Table 4.9-3.

Table 4.9-3: Carmel Valley Road and Cachagua Road Accident Analysis

Begin Milepost		End Milepost	Road Type		Expected Accident Rate (Accidents Per MVM)	2002 - 2004				2004			
						Jan 01 2002-Dec 31 2004 No. Collisions	2002 - 2004 Average AADT	Time period (Years)	Jan 01 2002-Dec 31 2004 Collision Rate (Accidents Per MVM)	Jan 01 2004-Dec 31 2004 No. Collisions	2004 AADT	Time period (Years)	Jan 01 2004-Dec 31 2004 Collision Rate (Accidents Per MVM)
CARMEL VALLEY RD													
0.00	-	0.55	4 Lanes Undivided	Suburban	2.55	13	24600	3	0.88	6	23600	1	1.27
0.55	-	1.72	4 Lanes Divided	Suburban	1.70	23	20700	3	0.87	10	24700	1	0.95
1.72	-	2.80	2 Lanes	Suburban	1.90	25	16833	3	1.26	10	19400	1	1.31
2.80	-	4.19	2 Lanes	Suburban	1.90	14	16833	3	0.55	7	17100	1	0.81
4.19	-	4.87	2 Lanes	Suburban	1.90	8	14633	3	0.73	3	17100	1	0.71
4.87	-	5.70	2 Lanes	Suburban	1.90	6	14633	3	0.45	0	14700	1	0.00
5.70	-	6.26	2 Lanes	Suburban	1.90	24	12067	3	**3.24**	10	14700	1	**3.33**
6.26	-	10.16	2 Lanes	Rural	1.33	59	11367	3	1.22	24	11400	1	**1.48**
10.16	-	11.49	2 Lanes	Suburban	2.95	38	11367	3	2.30	15	11100	1	2.78
11.49	-	12.00	2 Lanes	Urban	3.05	9	9267	3	1.74	2	11200	1	0.96
12.00	-	12.47	2 Lanes	Suburban	2.95	5	3767	3	2.58	0	8900	1	0.00
12.47	-	12.77	2 Lanes	Rural	1.76	1	3533	3	0.86	0	3500	1	0.00
12.77	-	14.12	2 Lanes	Rural	1.83	16	2270	3	**4.77**	7	3100	1	**4.58**
14.12	-	16.02	2 Lanes	Rural	1.84	15	2100	3	**3.43**	5	2100	1	**3.43**
Total Coll						256				99			
CACHAGUA RD													
0.00	-	3.00	2 Lanes	Rural	2.11	8	870	3	**2.80**	3	760	1	**3.60**

NOTES:

MVM: Million Vehicle Miles
Collision rates shown in bold exceed the expected accident rate based on state-wide accident history for similar type roads.

Between 2002 and 2004, accident rates exceeded the statewide average for roadways of similar type on Cachagua Road between Carmel Valley Road and the jJeep Trail. The poor horizontal alignment and narrow width of Cachagua Road are factors that contribute to the higher than expected accident rate on Cachagua Road.

4.9.2 ENVIRONMENTAL RESOURCE IMPACT STANDARDS AND METHODS

Standards of Significance

In accordance with CEQA and professional standards, a project impact would normally be considered significant if the project would:

- Cause an increase in traffic that is substantial in relation to the existing traffic loads and capacity of the roadway system;
- Cause a substantial deterioration of the roadway surface as a result of construction activities;
- Substantially increase the traffic delay experienced by motorists;
- Substantially alter present patterns of circulation or movement; or
- Cause traffic hazards for pedestrians or operators of motor vehicles or bicycles.

The County of Monterey intersection and road segment significance criteria was used to evaluate impacts to traffic operations. The County of Monterey uses the following significance criteria to assess traffic-related impacts to pre-project traffic operations:

Controlled Intersections

A significant impact would occur if an intersection operating at LOS A, B, or C, degrades to D, E, and F. For intersections already operating at unacceptable levels D and E, a significant impact would occur if a project adds 0.01 or more to the critical movement's volume-to-capacity ratio. If the intersection is already operating at LOS F any increase (one vehicle) in the critical movement's volume-to-capacity ratio is considered significant.

Uncontrolled Intersections

A significant impact would occur if any traffic movement has LOS F or any traffic signal warrant is met.

Roadway Segments

A significant impact would occur if a roadway segment operating at A through E degrades to a lower level of service of D, E, or F. If a segment is already operating at LOS F any increase (one vehicle) is considered significant.

Residential Streets

Residential streets typically carry low volumes of traffic such that the traffic load does not meet or exceed the street capacity. Quality of life is more important than street capacity in assessing impacts to residents on residential streets.

Impact Assessment Methodology

Analytical procedures used for this study are described below.

Trip Generation

Daily and peak hour trips that would be generated by the construction project were estimated for the Proponent's Proposed Project and the project alternatives. The project would generate new vehicle trips related both to the hauling of workers and materials to the site and the volume of trips generated by the project would vary throughout the construction project according to variations in manpower requirements and material delivery schedules.

Trip generation estimates were prepared for each phase of the construction. The trip generation estimate for each construction phase represents the highest daily and peak hour trip generation expected during the construction phase. A description of the number of employees for each phase of the construction project is provided in Section 3.2. Project phasing and information regarding access road improvements is also provided in Section 3.2.

Table 4.9-1 shows the assignment of daily trips generated by the project to the study road segments as well as the existing plus project daily traffic volumes and level of service for various segments of Carmel Valley Road and SR 1. With project traffic added to the road network, the existing road segment levels of service are not changed. However, the project would add traffic to the SR 1 north and south of Carmel Valley Road, which currently operates at LOS F. The project would temporarily add traffic to the existing deficient section of SR 1 north and south of Carmel Valley Road.

PEAK HOUR TRIP GENERATION

The analysis of intersection operations is based on peak one-hour traffic volumes during the AM and PM commute periods. The AM and PM peak hour project trip assignment figures show the estimated volume of traffic that the project would add to the three study intersections during the AM and PM peak commute hours. The AM and PM peak hour project trip assignments were combined with existing intersection volumes to achieve total project condition volumes that were analyzed to determine project impacts.

The AM and PM peak hour trip generation estimates for the project were converted to "passenger car equivalent" (PCE) trips before being assigned to the road network. The truck generated trips were increased by a factor of four to reflect the greater impact that trucks have versus passenger cars.

Most of the traffic generated by the project is expected to arrive from and depart to the west. However, it is possible that some traffic may be oriented to and from the east. A trip distribution pattern of 95 percent to the west and 5 percent to the east was assumed for the project-generated traffic.

The Proponent's Proposed Project would generate 23 inbound PCE trips and 10 outbound PCE trips. The new Tularcitos Access Road would be constructed to provide access to the Dam for the Proponent's Proposed Project. Referring to Figure 4.9-2, the AM peak hour volumes on the exhibit are as follows:

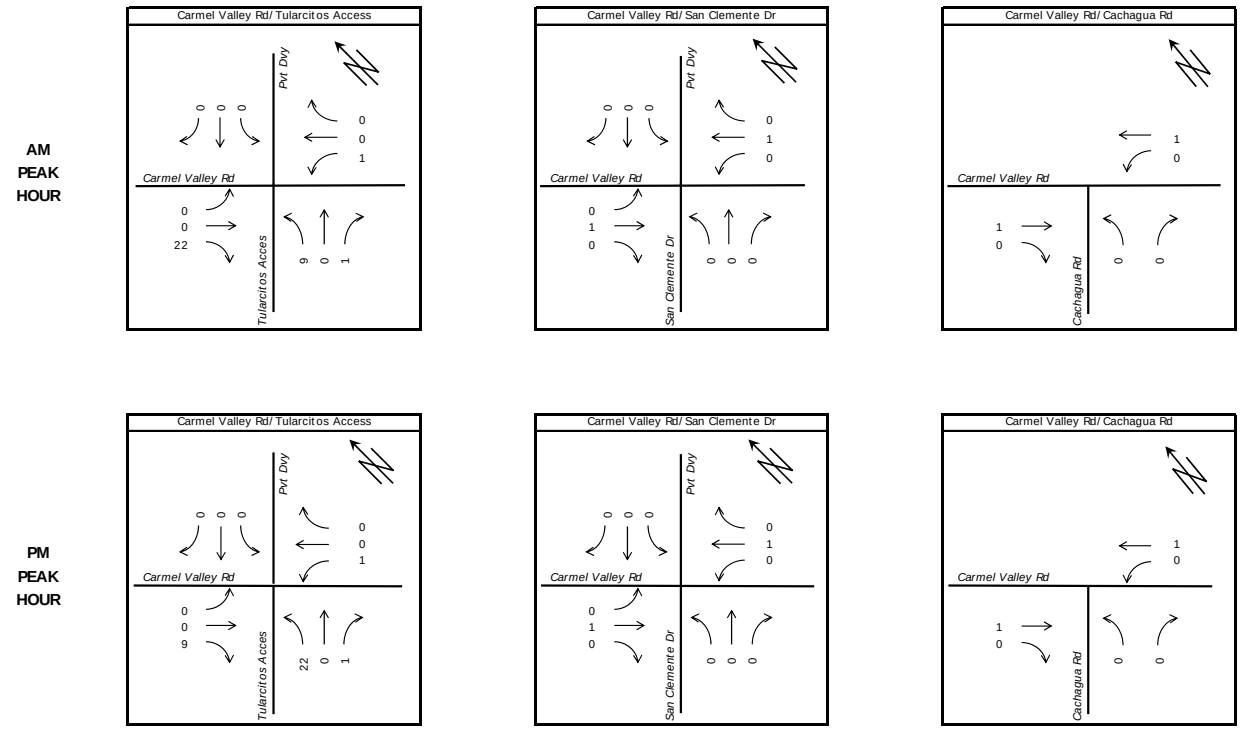
- 22 of the inbound trips are expected to arrive from the west and would make a right turn movement from eastbound Carmel Valley Road to the Tularcitos Access Road.
- One of the inbound trips is expected to arrive from the east and would make a left turn from westbound Carmel Valley Road to the Tularcitos Access Road.
- Nine of the outbound trips are expected to exit to the west and these trips would make a left turn from the Tularcitos Access Road to westbound Carmel Valley Road.
- One of the outbound trips is expected to exit to the east and this trip would make a right turn from the Tularcitos Access Road to westbound Carmel Valley Road.
- The one trip arriving from the east and the one trip departing to the east were modeled as through trips on Carmel Valley Road at the San Clemente Drive and the Cachagua Road intersections.

The trip generation during the PM peak hour is 10 inbound trips and 23 outbound trips. The trip assignment shown on Figure 4.9-2 is essentially a reverse of the AM peak hour trip assignment.

Daily Road Segment Volumes

Daily traffic volumes were estimated for Carmel Valley Road, Cachagua Road, Carmel Rancho Road, Rio Road and SR 1 for the Proponent's Proposed Project and the alternative projects and road segment levels of service were determined. The trip generation estimate for Phase 2 of the project was used in the analysis since it represents the maximum trip generation estimate for the project. A trip distribution pattern of 95 percent to the west and 5 percent to the east was assumed for the project, reflecting an expected predominant orientation of trips generated by the project to and from the west.

Figure 4.9-2: AM and PM Peak Hour Project Trip Assignment



NOTES:
Peak Hour Trip Generation reflects adjustment to account for the passenger car equivalents of large trucks

Intersection Operations

Project Condition (existing plus project) AM and PM peak hour traffic forecasts were prepared for the following intersections:

- Carmel Valley Road/Tularcitos Access Road;
- Carmel Valley Road/San Clemente Drive; and
- Carmel Valley Road/Cachagua Road.

Project Condition intersection operations were evaluated based on technical procedures documented in the 2000 Highway Capacity Manual (HCM).

Roadway Design

The adequacy of intersection and roadway geometrics at key access locations and routes were assessed using geometric design standards published by Caltrans, Monterey County and the AASHTO. The analysis included a review of intersection geometrics, left turn and right turn channelization warrants, roadway widths and sight distances.

Additional Levels of Delay

Motorists will tolerate additional levels of delay when traveling through a construction work zone. According to Caltrans policies, a significant traffic impact in a work zone is 30 minutes above normal recurring traffic delay on the existing facility or the delay threshold set by the District Traffic Manager, whichever is less. Applied in an urban environment, a queue of 2 to 3 miles on a freeway would result in a 30 minute delay. In a rural environment, such as the project location, motorists tolerate less delay. For this evaluation, a work zone delay greater than 10 minutes is considered a significant impact. This threshold is based upon the thresholds utilized by other state highway departments and engineering judgment. For example, the Indiana Department of Transportation work zone policy sets a maximum delay time of 10 minutes, the Maryland Department of Transportation uses an 8-minute delay threshold, the Massachusetts Highway Department uses a 12-minute delay threshold and the South Dakota Department of Transportation attempts to limit delay in work zones to 10 to 15 minutes.

2030 Baseline Conditions

Traffic volumes on the roadways serving the Project Area are expected to increase over time in relation to new development and increased economic activity including tourism. Traffic volumes on Carmel Valley Road through Carmel Valley have generally increased at an average annual rate of about 2 percent for the past 20 years. Traffic on SR 1 north and south of Carmel Valley Road has increased at an average annual rate of 2 percent to 3 percent for the past 20 years. If these growth rates continue into the future, traffic on the area roads would increase 40 to 60 percent from existing levels.

The San Clemente Dam Seismic Safety Project is expected to commence within three years. Because traffic-related impacts associated with project construction would occur in the near-term conditions are used to represent baseline conditions rather than 2030 volumes.

4.9.3 IMPACTS AND MITIGATION

The following impact issues have been defined for traffic and circulation:

TC-1: Road Segment Traffic Operations (additional traffic on area road network)

TC-2: Intersection Traffic Operations (changes to intersection level of service)

TC-3a: Traffic Safety Carmel Valley Road (increased accident rates)

TC-3b: Traffic Safety San Clemente Drive (increased accident rates)

TC-4: Inadequate Corner Sight Distances (adequate visual sight distance at intersections for stopping safety)

TC-5: New Intersections (effect on safety and traffic)

TC-6: Neighborhood Quality of Life (effect of increased traffic on residential neighborhoods)

TC-7: Pavement Loadings (effect of project traffic on pavement)

The traffic impacts of concern are associated with project construction. Of these, Traffic and Circulation Impact TC-6 would not apply, as residential roads would not be used for the Proponent's Proposed Project.

Proponent's Proposed Project

Issue TC-1: Road Segment Traffic Operations

Additional traffic on area road network
Determination: ***less than significant with mitigation, short-term***

IMPACT

The Proponent's Proposed Project would temporarily add construction-related traffic to the area road network Traffic generated by the proposed construction project would increase traffic volumes on Carmel Valley Road, Rio Road, Carmel Rancho Boulevard, SR 1 and San Clemente Drive.

The estimated number of daily and peak hour trips that would be generated by the construction project is summarized in Table 4.9-4. It is estimated that access improvements for the Proponent's Proposed Project would require 2,120 cubic yards of material. Delivered over a 35 day period in 18 cubic yard trucks would generate an average of 4 inbound loads per day, or 8 truck haul round trips per day. With the 15 employees on the site during Phase 1, total trip generation during Phase 1 would be 68 vehicle trips per day.

It was assumed that each employee on-site would generate four vehicle trips per day (two inbound trips and two outbound trips). This daily trip rate was used in the previous traffic studies for the project and accounts for deliveries of minor construction material, equipment, supplies, visitor trips and employee trips.

During Phase 2, a total of 16,408 tons of aggregate, cement, sand and other construction products would need to be imported to the project site. Delivered over an 80 day period at 25 tons per load, an average of 9 inbound loads per day, or 18 truck haul round trips per day would be generated during Phase 2. With a maximum of 80 employees on the site during Phase 2, total trip generation during Phase 2 would be 338 vehicle trips per day.

Table 4.9-4: Proponent's Proposed Project (Dam Thickening) Trip Generation

GENERATOR	DAILY TRAFFIC GENERATION	AM PEAK HOUR				PM PEAK HOUR			
		PEAK HOUR VOLUME	% OF DAILY	INBOUND	OUTBOUND	PEAK HOUR VOLUME	% OF DAILY	INBOUND	OUTBOUND
VEHICLE TRIPS									
VEHICLE TRIPS PHASE 1									
Employee Trips	60	17	28%	15	2	17	28%	2	15
Truck Trips	8	2	25%	1	1	2	25%	1	1
Total Trips	68	19	28%	16	3	19	28%	3	16
VEHICLE TRIPS PHASE 2									
Employee Trips	320	17	5%	15	2	17	5%	2	15
Truck Trips	18	4	22%	2	2	4	22%	2	2
Total Trips	338	21	6%	17	4	21	6%	4	17
PASSENGER CAR EQUIVALENCIES									
PCE's PHASE 1									
Employee Trips	60	17	28%	15	2	17	28%	2	15
Truck Trips	32	8	25%	4	4	8	25%	4	4
Total Trips	92	25	27%	19	6	25	27%	6	19
PCE's PHASE 2									
Employee Trips	320	17	5%	15	2	17	5%	2	15
Truck Trips	72	16	22%	8	8	16	22%	8	8
Total PCE's	392	33	8%	23	10	33	8%	10	23

NOTES:

PCEs = Passenger Car Equivalent

Under the Proponent's Proposed Project, the Jeep Trail would not be used for access to the Dam or to the reservoir. Therefore, the Proponent's Proposed Project would not impact the Jeep Trail.

Table 4.9-1 shows the assignment of daily trips generated by the project to the study road segments as well as the Existing plus Project daily traffic volumes and Level of Service for various segments of Carmel Valley Road and SR 1. With project traffic added to the road network, the existing road segment levels of service are not changed. However, the project would add traffic to the SR 1 north and south of Carmel Valley Road, which currently operates at LOS F. The project would temporarily add traffic to the existing deficient section of SR 1 north and south of Carmel Valley Road.

MITIGATION

By implementing the following measures, the impacts from additional traffic on area road network would be reduced to less than significant.

Trip Reduction Plan for Construction Workers

The Applicant will prepare a trip reduction plan that identifies measures that would be implemented to reduce the number of vehicle trips generated by construction workers. These measures would include a ride-sharing program using buses, and/or vanpools to reduce construction worker trips. The plan would establish an off-site park-and-ride area

for project employees in Carmel Valley Village or another remote location and promote the use of carpools or vanpools to transport employees to the project site.

Traffic Coordination and Communication Plan

The Applicant will prepare a traffic coordination and communication plan that would define the specific schedules for truck delivery and worker shifts to avoid periods of peak commute traffic including school bus traffic on area roadways. Truck deliveries would be prohibited at night and weekends. Delivery of major items would be limited to weekdays between 8:00 AM and 3:00 PM. Mechanisms for informing the public of construction traffic schedules and activities would be included in the plan. This would include an on-site field office for the resident Traffic/Transportation Coordinator. The Traffic/Transportation Coordinator would be available to answer questions from the public regarding scheduled construction activities and major construction traffic schedules impacting residents.

Traffic Safety Plan

The Applicant will prepare a traffic safety plan that would address the appropriate vehicle size and speed; travel routes; flag person requirements; coordination with law enforcement and fire control agencies; emergency access to ensure child, pet and livestock safety; and the need for traffic and speed limit signs including advance warning and/or construction work zone signing on Carmel Valley Road. Elements of the Traffic Safety Plan are described in greater detail below.

Vehicle Size and Traffic Limitations

The types of vehicles that would be used during the construction project and the maximum speed limit for each vehicle would be defined.

Travel Routes

The main access route for access to and from the project site would be Tularcitos Access Road. San Clemente Drive would be used during the first year of construction of the Proponent's Proposed Project, while the Tularcitos Access Route is being developed. Mobilization and demobilization of construction equipment using San Clemente Drive are expected to occur over a period of several weeks and involve 15 to 30 trips with heavy equipment. Thereafter, 5 to 10 trips per day on San Clemente Drive will be used for worker, supervisor and maintenance access over a period of up to eight months during the first year of construction. Periodic delivery of materials during project construction would occur as well, by construction vehicles for initial mobilization of equipment at the beginning of the project for several weeks, an occasional truck during the project, and demobilization of equipment at the end of the project for several weeks.

Flag person Requirements

During periods when double-trailer trucks are used, flagging personnel would be posted to direct traffic at the Carmel Valley Road/Tularcitos Access Road intersection.

Emergency Agency/Access

An emergency Contact Sheet would be posted that lists 24-hour emergency contact numbers for law enforcement and fire control agency personnel, the owner, contractor, Traffic/Transportation Coordinator, resident project representatives, and the Monterey Bay Unified Air Pollution Control District. San Clemente Drive would be used for emergency access only.

Construction Signing and Striping

The Applicant will implement a County-approved traffic control plan during project construction. The limits of the traffic control plan would extend to Carmel Village and include additional traffic control devices including speed advisory signs, curve warning signs, delineators, reflectors and edge line markings on Carmel Valley Road.

Vehicle and Driver Inspection Program

The Applicant will prepare a vehicle and driver inspection program that would require that drivers involved in project construction be properly licensed and that the vehicle be in safe condition and properly registered and loaded. The program would include requirements for inspecting heavy equipment before it enters the project construction area. It would also entail coordination with law enforcement and other agencies. All drivers employed by the contractor and subcontractors would be properly licensed and their vehicles would comply with all applicable regulations and would be in safe condition and registered. Drivers would be required to contact the Project Field Office prior to accessing the project site. A representative of the contractor or the Traffic/ Transportation Coordinator would certify that the vehicles are in safe condition and are properly registered and loaded prior to allowing access to the site. Vehicles would be weighed after loading and before entering the project site. A driver log indicating the date, time driver name, driver license number, type of vehicle, vehicle weight and verification of vehicle registration would be maintained at the field office.

Traffic Impact Fee

The Applicant will pay a traffic impact fee to the County to be applied towards improvements to SR 1 and Carmel Valley Road. The County's traffic impact fee for Carmel Valley does not specifically apply to a construction project of this nature. Therefore, the impact fee would be based on residential dwelling unit equivalents associated with the traffic generated by the project.

Per the requirements of the County's Public Works Department, a Construction Management Plan (CMP) would be prepared during the final design stage of the project, and implemented prior to commencing with the project. The CMP would include a comprehensive traffic/transportation plan that would meet the following objectives:

- Reduce the number of vehicles (construction related and other) generated by the project;

- Reduce the interaction between construction equipment and other vehicles; and

- Promote public safety through actions aimed at driver and road safety.

The Traffic Safety Plan described above would form the basis of the County-required traffic/transportation plan which would be prepared after consultation and coordination with project engineers, affected agencies and community groups. The applicant will appoint a Traffic/Transportation Coordinator to direct the development and implementation of the plan. The County of Monterey Planning and Building Department would enforce implementation of the CMP.

Issue TC-2: Intersection Traffic Operations

Changes to intersection level of service
Determination: ***less than significant with mitigation, short-term***

IMPACT

An estimate of the volume of AM and PM peak hour trips that would be generated during the peak period of construction activity was prepared based upon the following assumptions:

- A vehicle occupancy ratio of 1:0 is assumed for the employees (i.e., all employees are assumed to drive alone).

- All employees arrive during the AM peak hour and depart during the PM peak hour.

- Inbound employee trips during the AM peak hour are assumed to represent 90 percent of the AM peak hour employee and miscellaneous trips and outbound employee trips during the PM peak hour are assumed to represent 90 percent of the total employee and miscellaneous PM peak hour trips.

- During Phase 1, one truckload of aggregate was assumed to arrive during the AM and PM peak hours and the empty trucks are assumed to depart during the same peak hours as well. During Phase 2, two truckloads of aggregate and construction material were assumed to arrive during the AM and PM peak hours and the empty trucks are assumed to depart during the same peak hours as well.

Based on these assumptions, the project would generate 19 trips during the Phase 1 AM and PM peak hours and 21 vehicle trips during the Phase 2 AM and PM peak hours.

For intersection capacity and channelization analyses, the peak hour truck trips generated by the project were converted to passenger car equivalent trips to account for the greater impact associated with each truck in the vehicle stream. Consistent with previous traffic analyses prepared for the project, four passenger car equivalents (PCEs) were assumed per truck (Transportation Research Board 1985). The project would generate 25 AM and PM peak hour passenger car-equivalent trips during Phase 1 and 33 AM and PM peak hour passenger car-equivalent trips during Phase 2.

Figure 4.9-2 shows the assignment of project generated AM and PM peak hour trips to the study intersections. The passenger car equivalent trip generation estimate figures for Phase 2 were used in this analysis and a trip distribution pattern of 95 percent to the west and 5 percent to the east was assumed. Most of the ingress and egress for the Proponent's Proposed Project would occur via the new Tularcitos Access once it is completed. However during CY 1, of the Proponent's Proposed Project, mobilization and demobilization of construction equipment using San Clemente Drive are expected to occur over a period of several weeks and involve 15 to 30 trips with heavy equipment. Thereafter, 5 to 10 trips per day on San Clemente Drive will be used for worker, supervisor and maintenance access over a period of up to eight months. Periodic delivery of materials during project construction would occur as well.

Project Condition AM and PM peak hour intersection volumes were achieved by combining the AM and PM peak hour traffic assignment for the project with the existing intersection volumes. The Project Condition AM and PM peak hour volumes are shown in Figure 4.9-3.

Project Condition AM and PM peak hour intersection levels of service are summarized in Table 4.9-2. With traffic from the Proponent's Proposed Project added to the study intersections, intersection levels of service are unchanged from existing conditions. However, the residents along San Clemente Drive may experience a short-term significant impact during AM and PM peak hours upon departure and return to their residents.

MITIGATION

Mitigation Measures would be the same as Issue TC-1 (Road Segment Traffic Operations) for the Proponent's Proposed Project. The described mitigation would reduce the impact to less than significant.

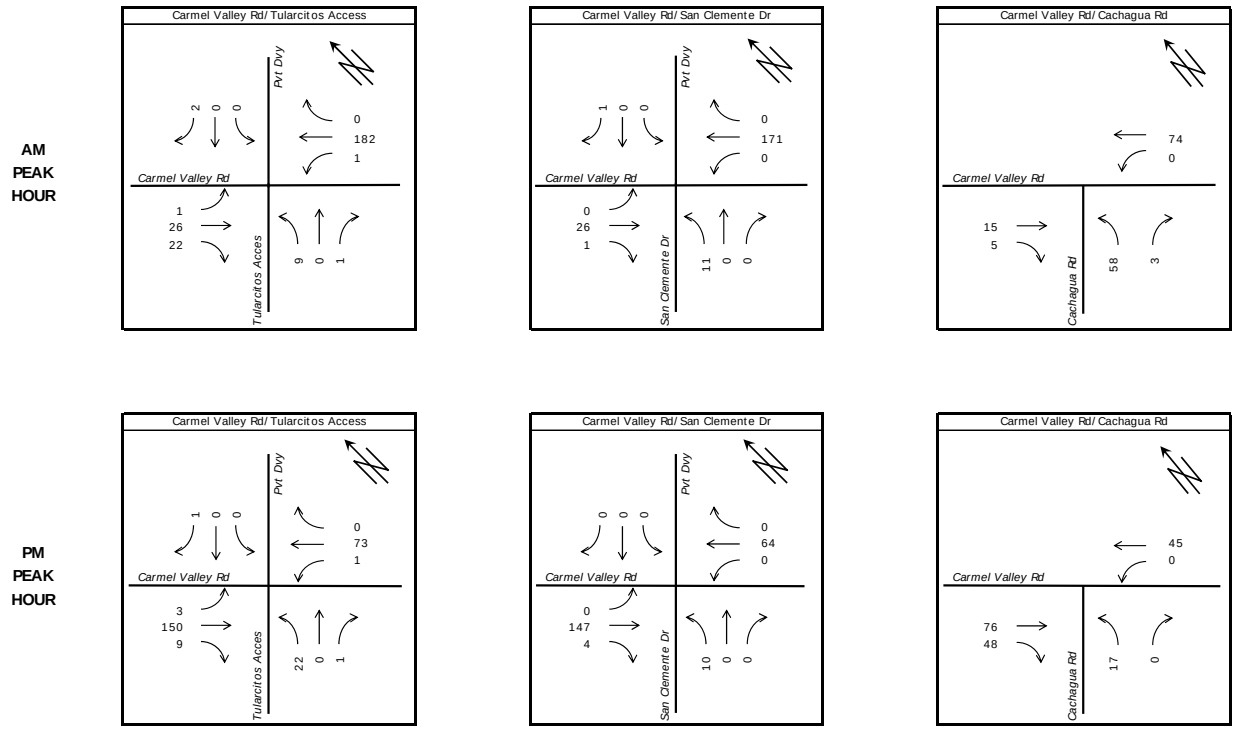
Issue TC-3a: Traffic Safety Carmel Valley Road

Increased accident rates
Determination: ***less than significant with mitigation, short-term***

IMPACT

The project would temporarily add construction traffic to the segment of Carmel Valley Road east of Carmel Village, which has poor horizontal alignments, minimal shoulder width and narrow travel lanes in some locations. This segment of Carmel Valley Road currently experiences relatively high accident rates. Research has shown that large trucks experience accidents at a higher rate than passenger vehicles. Therefore, the Proponent's Proposed Project could potentially increase accident rates on Carmel Valley Road.

Figure 4.9-3: Existing Plus Project AM and PM Peak Hour Intersection Volumes



MITIGATION

The accident rate on Carmel Valley Road east of Carmel Village currently exceeds expected accident rates for the roadway and it is recommended that mitigation be directed to this segment of Carmel Valley Road. Mitigation for impacts under Issue TC-1 (Road Segment Traffic) would also apply. In addition, the Applicant will work with the County Public Works Department to determine if funding additional enforcement on Carmel Valley Road throughout the period of the project when truck traffic would be generated by the Project is appropriate and reasonable in comparison to the potential impacts. The Applicant will subsequently pay additional funding for extra enforcement, which will monitor speeds and enforce truck inspections.

Issue TC-3b: Traffic Safety San Clemente Drive

Increased accident rates
Determination: ***significant, unavoidable, short-term***

Impact

The project would temporarily add construction traffic to San Clemente Drive which currently has minimal traffic as it resides between two locked gates. During the first year of construction of the Proponent's Proposed Project, site access will be developed. Mobilization and demobilization of construction equipment using San Clemente Drive are expected to occur over a period of several weeks and involve 15 to 30 trips with

heavy equipment. Thereafter, 5 to 10 trips per day on San Clemente Drive will be used for worker, supervisor and maintenance access over a period of up to eight months during the first year of construction of the Tularcitos Access Road. Periodic delivery of materials would occur as well but it would not be considered significant. However, with only 140 vehicles per day using San Clemente Drive, any large vehicle traffic could be considered a significant and unavoidable impact to safety.

MITIGATION

Mitigation measures under Issue TC-1 (Road Segment Traffic) would be applied to minimize impacts under Issue TC-3b (Traffic Safety San Clemente Drive). However, even with the mitigation measures, it is not clear that the impacts would be reduced to less than significant levels.

Issue TC-4: Inadequate Corner Sight Distances

Adequate visual sight distance at intersections for stopping safety
Determination: ***less than significant, no mitigation required***

IMPACT

The corner sight distance from the location of the new access road looking to the west along Carmel Valley Road is approximately 300 feet and the sight distance from the location of the new access road to the east along Carmel Valley Road is approximately 350 feet. The recommended stopping sight distance for a 40-mile per hour design speed is 300 feet. Therefore, the proposed location of the Carmel Valley Road/new access road intersection would provide adequate stopping sight distance on Carmel Valley Road.

MITIGATION

Mitigation measures would not be required under the Proponent's Proposed Project.

Issue TC-5: New Intersections

Effect on safety and traffic
Determination: ***less than significant with mitigation, short-term***

IMPACT

Construction of the Tularcitos Access Road would add a new intersection on Carmel Valley Road. The intersection would be designed to meet Monterey County design standards MCPWG 2003). During periods of peak traffic demand during the construction project, the new intersection would operate at LOS A.

MITIGATION

Per Monterey County's required encroachment permit, the Applicant will design and construct a new intersection at Tularcitos Access and Carmel Valley Roads. The new intersection would be appropriately identified with advance warning and/or construction work zone signing on Carmel Valley Road. Analysis of the peak hour intersection

operations indicates that left-turn channelization would not be required on the westbound Carmel Valley Road approach and a right turn lane would not be required on the eastbound Carmel Valley Road approach to the new Tularcitos Access Road. However, the Applicant will design and construct a right turn taper on the eastbound Carmel Valley Road approach to Tularcitos Access Road.

Issue TC-6: Neighborhood Quality of Life

Effect of increased traffic on residential neighborhoods
*Determination**: significant, unavoidable, short-term***

During the first year of construction of the Proponent's Proposed Project, site access will be developed. Mobilization and demobilization of construction equipment using San Clemente Drive are expected to occur over a period of several weeks and involve 15 to 30 trips with heavy equipment. Thereafter, 5 to 10 trips per day on San Clemente Drive will be used for worker, supervisor and maintenance access over a period of up to eight months during the first year of construction of the Tularcitos Access Road. The construction of the Tularcitos Access Route will occur during the initial phase of project work, before extensive work is done at the dam site. After Tularcitos construction, access to the project site would be provided via the Tularcitos Route, avoiding San Clemente Drive for most construction equipment and materials. These short-term, significant, unavoidable impacts would only occur during a portion of CY 1.

MITIGATION

Mitigation measures required under the Proponent's Proposed Project would be the measures implemented for TC-1 on San Clemente Drive. While these measures will minimize impacts, they would not reduce them to less than significant levels.

Issue TC-7: Pavement Loadings

Effect of project traffic on pavement
*Determination**: less than significant with mitigation, short-term***

The Proponent's Proposed Project would generate estimated 1,582-truck trips over the duration of the project. Over a 10-year design period, the project would generate an average of 0.61 truck trips per day, which would generate 2,101 equivalent single axle loads (ESALs). It is estimated that the segment of Carmel Valley Road near the project site is subject to the application of 76,824 ESALs over a 10-year time period based on the existing ADT of 2,230 vehicles per day and assuming 1 percent trucks on this segment of Carmel Valley Road. The existing truck loadings equate to a Traffic Index (TI) of 6.6. The TI is a measure of axle loadings that determines pavement structure requirements. With the project traffic loadings added to the existing ambient loadings, the total ESALs would increase to 78,925, which equates to a TI of 6.7. Because the TI changes with the additional loadings generated by the project, the project would have a significant impact to the pavement loadings on Carmel Valley Road east of Carmel Village.

MITIGATION

The Proponent's Project Proponent would repair any damage to Carmel Valley Road east of Carmel Village and restore it to its pre-project condition immediately after construction has been completed. In addition, the Applicant will coordinate with local agencies to determine whether the proposed routes for truck travel are appropriate before beginning construction.

Alternative 1 (Dam Notching)

Impacts and mitigation measures for Traffic and Circulation Issue TC-5 (New Intersections) would not apply to Alternative 1.

Impact TC-1: Road Segment Traffic Operations

Additional traffic on area road network
Determination: ***significant, unavoidable, short-term***

IMPACT

Alternative 1 would temporarily add construction-related traffic to the area road network. Traffic generated by the proposed construction project would increase traffic volumes on Carmel Valley Road, Rio Road, Carmel Rancho Boulevard, SR 1 and Cachagua Road.

The estimated number of daily and peak hour trips that would be generated by the Alternative 1 (Dam Notching) is summarized in Table 4.9-5. Trip generation estimates were prepared for each phase of the construction. The trip generation estimate for each construction phase represents the highest daily and peak hour trip generation expected during the construction phase. A description of the number of employees for each phase of the Alternative 1 construction project is provided in Section 3.3. Phasing and information regarding access road improvements is also provided in Section 3.3.

Under Alternative 1, the Jeep Trail from Cachagua Road to the disposal site, a distance of 1.5 miles, would be widened to 20-foot. A minimum width of 15 feet with turnouts for passing would be provided in tight reaches. The radius of curvature at sharper curves would be widened and a drainage ditch would be constructed on the uphill edge of the road. The surface would consist of 6 inches of Class II base rock and a double chip seal coat. A "Truck Crossing 500 Feet" sign would be installed on both Cachagua Grade approaches to the Jeep Trail. In addition, the Jeep Trail approach to Cachagua Road would be paved. It is estimated that access improvements for the Jeep Trail and the new road between the Jeep Trail and the Dam for Alternative 1 would require 4,250 cubic yards of material. Delivered over a 100-day period in 18 cubic yard trucks, an average of 5 inbound loads per day, or 10 truck haul round trips per day would be required to import the material for road improvements. With the 20 employees on the site during Phase 1, total trip generation during Phase 1 would be 90 vehicle trips per day.

Table 4.9-5: Alternative 1 (Dam Notching) Trip Generation

GENERATOR	DAILY TRAFFIC GENERATION	AM PEAK HOUR				PM PEAK HOUR			
		PEAK HOUR VOLUME	% OF DAILY	INBOUND	OUTBOUND	PEAK HOUR VOLUME	% OF DAILY	INBOUND	OUTBOUND
VEHICLE TRIPS									
VEHICLE TRIPS PHASE 1 (Year 1)									
Employee Trips	80	22	28%	20	2	22	28%	2	20
Truck Trips	10	2	20%	1	1	2	20%	1	1
Total Trips	90	24	27%	21	3	24	27%	3	21
VEHICLE TRIPS PHASE 2 - (Year 2)									
Employee Trips	180	26	14%	23	3	45	25%	22	23
Truck Trips	0	0	-	0	0	0	-	0	0
Total Trips	180	26	14%	23	3	45	25%	22	23
VEHICLE TRIPS PHASE 2 - (Year 3)									
Employee Trips	240	42	18%	38	4	60	25%	22	38
Truck Trips	10	2	20%	1	1	2	20%	1	1
Total Trips	250	44	18%	39	5	62	25%	23	39
PASSENGER CAR EQUIVALENCIES									
PCE's PHASE 1 (Year 1)									
Employee Trips	80	22	28%	20	2	22	28%	2	20
Truck Trips	40	8	20%	4	4	8	20%	4	4
Total Trips	120	30	25%	24	6	30	25%	6	24
PCE's PHASE 1 (Year 2)									
Employee Trips	180	26	14%	23	3	45	25%	22	23
Truck Trips	0	0	-	0	0	0	-	0	0
Total Trips	180	26	14%	23	3	45	25%	22	23
PCE's PHASE 2 (Year 3)									
Employee Trips	240	42	18%	38	4	60	25%	22	38
Truck Trips	40	8	20%	4	4	8	20%	4	4
Total PCE's	280	50	18%	42	8	68	24%	26	42

NOTES:

PCE's = Passenger Car Equivalent

Phase 2 would require two years to complete. The first year of Phase 2 would consist primarily of sediment transfer. Sediment transfer would be accomplished in two shifts. For the trip generation analysis, the 45 workers were split between the day and swing shift. On this basis, 180 trips would be generated per day during the first year of Phase 2.

Sediment transfer would continue during the second year of Phase 2. In addition, fish ladder and spillway overflow improvements would be constructed with the potential for this work to overlap with the sediment transfer operation. For the trip generation analysis, the 45 sediment transfer workers were split into two shifts and 15 additional workers were included in the day shift. Alternative 1 would require the import of 1,500 cubic yards of concrete, which would be accomplished near the end of the project, at a rate of 4 to 5 loads per day. For this analysis, it was assumed that these trips would overlap sediment transfer operations. On this basis, 250 trips would be generated per day during the second year of Phase 2.

Table 4.9-1 shows the assignment of Alternative 1 project daily trips to the study road segments and the road segment levels of service. Adding traffic generated by Alternative 1 to the road network, the existing road segment levels of service would not be changed. The impact significance to Carmel Valley Road and SR 1 would be the same as discussed for TC-1 (Road Segment Traffic) for the Proponent's Proposed Project, The additional trips added by Alternative 1 to Cachagua Road would not change the operating level of service for this facility.

Under Alternative 1, a new 0.5-mile access road (Conveyor Road) with a width of 25 feet and a 3 foot drainage ditch would be built from the disposal site to the reservoir. The excavated slope would be stabilized with anchors, wire mesh and shotcrete as needed. The surface would consist of 6 inches of Class II base rock with a double chip seal coat. Fifteen-inch diameter culverts with inlet structures would be installed at 400 foot intervals. The belt conveyor would be installed along the outside edge of the road.

The sediment disposal plan proposed in the Draft EIR/EIS would have intersected and cut off the Jeep Trail that leads to the Stone Cabin, denying access beyond the site during construction (two years). However, as discussed in Chapter 3, the disposal site (4R) has been moved uphill and a conveyor overcrossing would be provided to avoid any impact on access to the cabin via the Jeep Trail during construction.

With the exception of the narrower sections, two-way vehicular operations would be feasible on the improved Jeep Trail. The narrower sections would be limited to one-way vehicular operation. Turnouts would be provided where necessary to provide adequate traffic flow.

The Jeep Trail would be used for employee access and for the delivery of conveyor equipment and other construction equipment for Alternative 1. Improvements to the Jeep Trail would be made and the conveyor road would be constructed during the first construction season. Use of the Jeep Trail and conveyor road under Alternative 1 is estimated as follows:

- Project worker access during the construction season (all year during the first construction season and May to October during the following two seasons) through the Jeep Trail that leads by the Stone Cabin and then the conveyor road (once constructed).

- Mobilization of conveyor equipment during the first and third seasons, resulting in roughly 150 trips over 2 to 3 month for each mobilization.

- Mobilization of heavy earth moving and construction equipment (roughly 20 to 40 trips of large equipment) at the beginning and end of each construction season (May and October) for 3 seasons, averaging 2 to 3 loads per day for the first and last month of construction.

- Occasional (bi-weekly) mid-size equipment mobilization (e.g., equipment/supply trucks, cranes, backhoes, and small dozers).

During the peak construction activity, it is estimated that 250 vehicle trips per day would be generated by Alternative 1, most of which would travel on the Jeep Trail between Cachagua Road and the new reservoir access road/conveyor road. The level of construction traffic generated by the project would be relatively low and at levels that could be adequately served by the proposed road design. The 20-foot wide sections of the Jeep Trail would be adequate for two-way travel. The American Association of State Highway and Transportation Officials (AASHTO) publish design guidelines for low-volume local roads.[1] The minimum recommended width is 18 feet for a recreational road and 20 feet for a resource recovery road.

The one-lane, two-way segments located along the Jeep Trail would require additional traffic control measures, particularly where sight distance is constrained approaching the one-lane sections. Turnouts would be provided along the sections of the Jeep Trail that would be limited to one-way travel. This would enhance two-way traffic operations on the one-lane sections.

During the construction of the Jeep Trail improvements, non-project related traffic traveling on the Jeep Trail would be subjected to delays. As previously stated, the volume of traffic currently using the Jeep Trail is low. However, the Jeep Trail provides access to non-project related parcels in the area and construction activity on the trail would impact access to those parcels. Construction related delays would occur during the first construction season, primarily from May through August. At this time, it is not possible to precisely estimate the delay that non-project traffic would incur on the Jeep Trail during construction of improvements to the Jeep Trail. The amount of delay that a motorist on the Jeep Trail would experience during the road construction period would depend on the construction activity underway at the time the motorist arrives at the section under construction and the amount of time required by the construction crew to create a passable surface for the motorist. Because the amount of time that would be required to create a passable road surface is not known, the impact of the project during the construction of improvements to the Jeep Trail would be significant.

During mobilization periods, heavy earth moving equipment, construction equipment and the conveyor system would be transported by truck to and from the reservoir. The largest amount of truck trips would occur at the beginning of the construction season (May) and the end of the construction season (October). However, truck trips would be generated throughout the construction season. It is estimated that the peak truck generation would be 10 trips per day.

Traffic movements on the Jeep Trail would be controlled by flagmen when large trucks are transporting equipment to and from the project. Non-project traffic on the Jeep Trail

[1] *Guidelines for Geometric Design of Very Low-Volume Local roads (ADT<400)*, American Association of State Highway and Transportation Officials, 2001.

at the same time as the project generated truck traffic could incur periods of delay. To reduce the amount of delay that non-project traffic would experience, these vehicles could be positioned in turnouts or other wide sections of the jeep trial until the large truck passed. Under a worst-case condition, non-project traffic could be required to wait at either end of the 1.5 mile section of Jeep Trail that is being used by the project until the road was clear of the large trucks. The project would use 1.5 miles of the Jeep Trail and, assuming that a large truck would travel at an average speed of 10 miles per hour while traveling between the conveyor/reservoir access road and Cachagua Road, the motorist would experience 9 minutes of delay. This delay would be less than the 10 minute work zone delay threshold and, therefore, the delay would not be a significant impact.

It is not known at this time whether delays to non-project related users could be reduced to less than 10 minutes during the construction of improvements to the trail. Therefore, the impact of Alternative 1 to Jeep Trail users during road improvements would be significant and unavoidable. Impacts during the construction of improvements to the Jeep Trail could be reduced to less than significant levels if the Communication Plan includes procedures that allow the other users of the Jeep Trail to provide the construction contractor with a schedule for their use of the Jeep Trail. Construction activities could then be planned to minimize delays to the other users of the Jeep Trail.

MITIGATION

Mitigation for Issue TC-1 would be the same as described for the Proponent's Proposed Project. The Construction Management Plan would be expanded to include Cachagua Road and the Jeep Trail and would include the following additions:

- Cachagua Road would be the main access route for the Alternative 1 project.
- During periods when double-trailer trucks are used, flagging personnel would be posted to direct traffic at the Carmel Valley Road/Cachagua Road intersection.
- The traffic control plan would include Carmel Valley Road between Carmel Village and Cachagua Road, Cachagua Road and the Jeep Trail.
- Transport trucks would be escorted when traveling between Carmel Valley Road and the Jeep Trail. The escort vehicle would assist with traffic control during the ingress and egress movements. At some locations on Cachagua Road, it will be necessary to stop control opposing traffic movements during haul operations.

The Traffic Coordination and Communication Plan would include procedures for distributing the schedule of construction activities to the other users of the Jeep Trail. Procedures would be included in the Plan that would minimize the delay to non-project related Jeep Trail users during construction of improvements to the road as well as during subsequent project activities.

Issue TC-2: Intersection Traffic Operations

Changes to intersection level of service
Determination: ***less than significant, no mitigation required.***

IMPACT

The total peak hour trip generation during Phase 1 would be 24 trips during the AM and PM peak hours. During the first year of Phase 2, 26 trips would be generated during the AM peak hour and 45 trips during the PM peak hour. During the second year of Phase 2, 44 trips would be generated during the AM peak hour and 62 trips during the PM peak hour.

Figure 4.9-4 shows the assignment of AM and PM peak hour trips generated by Alternative 1 to the study intersections. The passenger car equivalent trip generation estimates for year two of Phase 2 were used in this analysis. A trip distribution pattern of 95 percent to the west and 5 percent to the east was assumed for the project. The volume of project traffic using San Clemente Drive will vary throughout the project, but not projected to exceed 12 trips per day. Five percent of project traffic generated during the AM and PM peak hours was assigned to San Clemente Drive and 95 percent to Cachagua Road.

Alternative 1 AM and PM peak hour intersection volumes were achieved by combining the AM and PM peak hour traffic assignment for the project with the existing intersection volumes. The Alternative 1 AM and PM peak hour volumes are shown on Figure 4.9-5.

The Alternative 1 AM and PM peak hour intersection levels of service are summarized in Table 4.9-2. With traffic from Alternative 1 added to the study intersections, intersection levels of service would be unchanged from existing conditions.

Figure 4.9-4: AM and PM Peak Hour Alternative 1 Trip Assignment

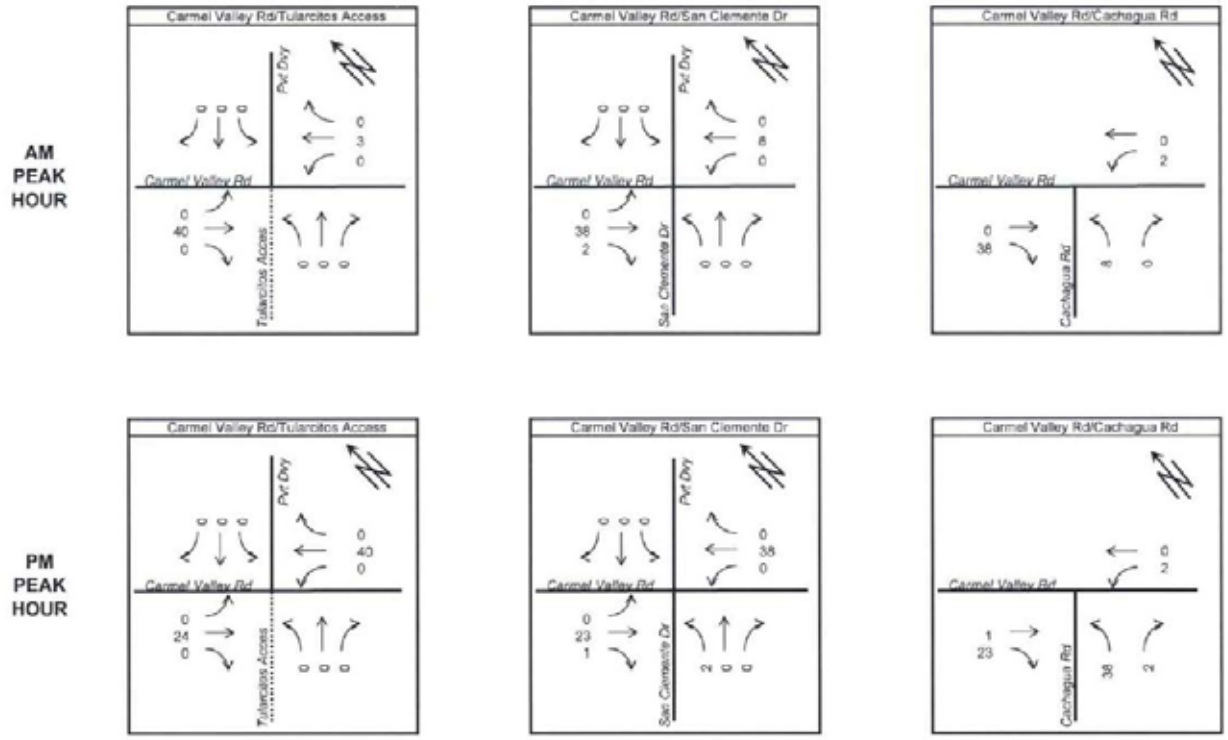
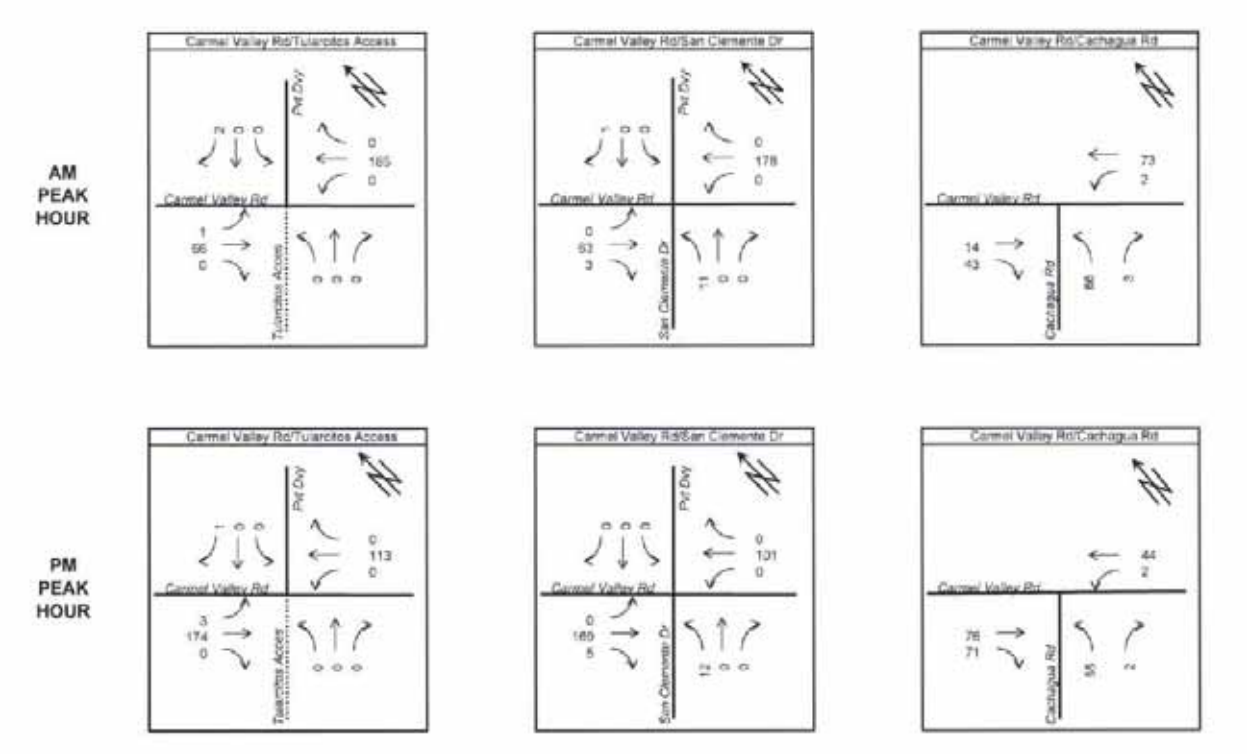


Figure 4.9-5: Existing Plus Alternative 1 AM and PM Peak Hour Intersection Volumes



Based on the forecasted traffic volumes with the addition of Alternative 1, channelization would not be required at the Camel Valley Road intersection with the Cachagua Road.

MITIGATION

Mitigation Measures would not be required under Alternative 1.

Issue TC-3a: Traffic Safety Carmel Valley Road

Increased accident rates
Determination: ***less than significant with mitigation, short-term***

The impact potential to Carmel Valley Road would be the same as discussed for Impact TC-3 for the Proponent's Proposed Project. In addition, construction related traffic would be added to Carmel Valley Road up to Cachagua Road. This would extend the area of impact to these facilities.

Cachagua Road would be used to transport aggregate to the project site for improvements to dam access roads. This segment of Cachagua Road has poor horizontal alignments, minimal shoulder width and narrow travel lanes in some locations and an accident rate that exceeds the expected accident rate. Alternative 1 could potentially increase accident rates on Cachagua Road.

An analysis of the geometric alignment of Cachagua Road was performed to ensure that the transport trucks negotiate roadway. The AUTOTURN software program was used for this analysis. Figure 4.9-6 identifies locations with inadequate width to serve the turning requirements of the transport truck traveling south from Carmel Valley Road to the Jeep Trail. The locations shown on Figure 4.9-6 with inadequate geometrics require pavement widening to ensure that the transport trucks can turn without leaving the pavement. It should also be noted that the double trailer transport truck would encroach into the opposing travel lane for most of Cachagua Road given the horizontal alignment of the road.

MITIGATION

Mitigation for Issue TC-3 would be similar as described for the Proponent's Proposed Project. In addition, an improvement plan would be developed for Cachagua Road to widen the roadway providing additional pavement and ensuring haul truck turning requirements can be met.

Issue TC-3b: Traffic Safety San Clemente Drive

Increased accident rates
Determination: ***significant, unavoidable, short-term***

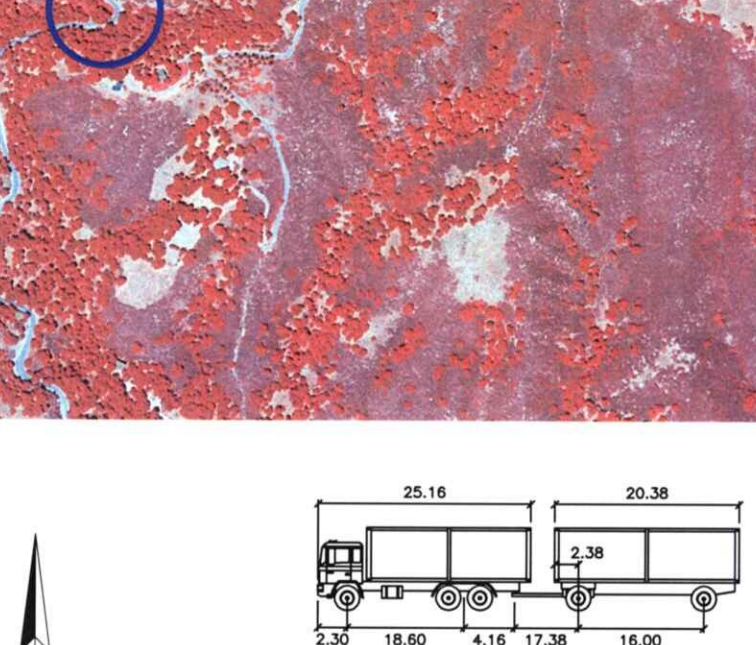
For Alternatives 1, 2 and 3 the Cachagua Access Route would be the primary route providing access above the Dam. However, San Clemente Drive would be needed to provide access below the Dam which is not accessible from the Chachagua route. San Clemente Drive would be used for initial mobilization of equipment for several weeks at the beginning of each construction year for three years, an occasional truck and workers during the project, and demobilization and equipment at the end of each construction year for a period of several weeks. The amount of trips during that several week period is expected to be 15 to 30 trips with heavy equipment. It is anticipated that less than 25 percent of the total construction traffic would use San Clemente Drive for access below the Dam. The number of trips added to San Clemente Drive is not projected to exceed 12 trips per day. San Clemente Drive is a narrow two-lane road with no facilities for pedestrians and bicyclists. The impact to pedestrian and bicycle circulation on San Clemente Drive would be a significant, unavoidable impact.

MITIGATION

Mitigation for impacts to traffic safety associated with San Clemente Drive would be the same as described for the Proponents.Proposed Project TC-1 (Road Segment Traffic).

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= LOCATIONS WITH INADEQUATE GEOMETRIC DESIGN TO SERVE THE TURNING REQUIREMENTS OF A TOWBAR TRAILER TRUCK.



Towbar Trailer Truck	feet		
First Unit Width	: 8.00	Lock to Lock Time	: 6.00
Trailer Width	: 8.00	Steering Angle	: 40.00
First Unit Track	: 8.00	Articulating Angle	: 70.00
Trailer Track	: 8.00		

GRAPHIC SCALE

750 0 375 750 1500

(IN FEET)
1 inch = 750 ft.

FIGURE 4.9-6 CACHAGUA ROAD TRUCK TURNING STUDY

Issue TC-4: Inadequate Corner Sight Distances

Adequate visual sight distance at intersections for stopping safety
Determination: ***less than significant with mitigation, short-term***

IMPACT

The corner sight distance looking to the east from the Cachagua Road approach to Carmel Valley Road is currently not adequate. Alternative 1 would add trips to this intersection.

The corner sight distance looking to the north from the Jeep Trail approach to Cachagua Road is not adequate. The corner sight distance provided at the Cachagua Road intersection with the Jeep Trail is deficient looking to the north. The existing corner sight distance looking from the Jeep Trail to the north is 160 feet and the corner sight distance looking to the south is 350 feet. The sight distance looking to the south for a 35-mph design speed is adequate. A corner sight distance of 275 feet should be provided looking to the north.

MITIGATION

The Applicant will construct improvements at the Carmel Valley Road/Cachagua Road intersection to increase the sight distance provided for a motorist looking to the east from the Cachagua Road approach. The Applicant will also relocate the stop bar on the Cachagua Road approach to Carmel Valley Road to lengthen the sight distance looking to the east. In addition, physical improvements would be required at the intersection to provide further improvement to the sight distance. These include re-grading the embankment on the south side of Carmel Valley Road east of the Cachagua Road.

The Applicant will construct improvements at the Cachagua Road/Jeep Trail intersection to increase the sight distance provided for a motorist looking to the north from the Jeep Trail approach. The Applicant will improve the sight distance by either lowering the elevation of the embankment located on the east side of Cachagua Road north of the Jeep Trail or relocating the intersection of the Jeep Trail to increase the sight distance looking to the north.

Issue TC-6 Neighborhood Quality of Life

Effect of increased traffic on residential neighborhoods
Determination: ***significant, unavoidable, short-term***

IMPACT

Under Alternative 1 construction traffic would increase on to San Clemente Drive as described under Issue TC-3b and in Chapter 3.3. San Clemente Drive is a private street that serves a residential development and provides access below the Dam. Impacts under Issue TC-6 (Neighborhood Quality of Life) would be greater than under the Proponent's Proposed Project, because San Clemente Drive would be used for mobilization and demobilization below the Dam and for occasional use during the

project. Although San Clemente Drive would not be the primary access route for this Alternative (Cachagua Access Route would be the primary access route), it would be the only access route below the Dam (whereas under the Proponent's Proposed Project this function would be served by the Tularcitos Route). San Clemente Drive would be used for initial mobilization of 15 to 30 trips with heavy equipment at the beginning of the project for several weeks, an occasional truck and workers during the project, and demobilization of equipment at the end of the project for a period of several weeks each construction year for three years. It is anticipated that less than 25 percent of the total construction traffic would use San Clemente Drive for access below the Dam. The number of trips added to San Clemente Drive is not projected to exceed 12 trips per day.

San Clemente Drive would continue to operate at LOS A based on neighborhood quality of life level of service thresholds. However, any amount of truck traffic within the gated community of Sleepy Hollow may be considered significant impact to the quality of life of the residents.

Issue TC-6 (Neighborhood Quality of Life) on the Jeep Trail would be significant for the users of the Stone Cabin. The only traffic currently on the Jeep Trail is from the recreational users of the Stone Cabin. Therefore, the increase of traffic would be a significant impact to neighborhood quality of life.

MITIGATION

Mitigation measures under TC-1 would be implemented. However, mitigation measures would not reduce impacts to San Clemente Drive and the Jeep Trail to less than significant for Issue TC-6 (Neighborhood Quality of Life) under Alternative 1.

Issue TC-7: Pavement Loadings

Effect of project traffic on pavement
Determination: ***less than significant with mitigation, short-term***

IMPACT

Alternative 1 would generate an estimated 814 truck trips over the duration of the project. Over a 10-year design period, the project would generate an average of 0.31 truck trips per day, which would generate 1,078 equivalent single axle loads (ESALs). With the project traffic loadings added to the existing ambient loadings, the total ESALs would increase to 77,902, which equates to a Traffic Index (TI) of 6.6. The additional loadings would not change the existing TI.

Alternative 1 would add pavement loadings to Cachagua Road. It is estimated that Cachagua Road would be subject to the application of 26,182 ESALs over a 10-year time period based on the existing ADT of 760 vehicles per day and assuming 1 percent trucks on this segment of Cachagua Road. The existing truck loadings equate to a TI of 5.8. Adding the Alternative 1 traffic loadings to the existing ambient loadings, the total

ESALs would increase to 27,261, which equates to a TI of 5.9. The TI would change with the additional loadings generated by Alternative 1.

MITIGATION

Mitigation for Issue TC-7 would be the same as described for the Proponent's Proposed Project. Additionally, the Applicant will repair of any damage to Cachagua Road between Carmel Valley Road and the Jeep Trail and restore it to its pre-project condition immediately after construction has been completed.

Alternative 2 (Dam Removal)

Traffic and Circulation impacts and mitigation for Issues TC-3a: (Traffic Safety Carmel Valley Road), TC-3b: (Traffic Safety San Clemente Drive), TC-4 (Inadequate Corner Sight Distances) and TC-6 (Neighborhood Quality of Life) would be the same as discussed for Alternative 1 except they would increase from three construction seasons to four construction seasons. Issue TC-5 (New Intersections) would not apply to Alternative 2, as there are no new intersections.

Issue TC-1: Road Segment Traffic Operations

Additional traffic on area road network
Determination: ***significant, unavoidable, short-term***

IMPACT

The trip generation estimate for Alternative 2 (Dam Removal) is summarized in Table 4.9-6. A description of the number of employees for each phase of the Alternative 2 construction project is provided in Section 3.4. Phasing and information regarding access road improvements is also provided in Section 3.4.

Under Alternative 2, access improvements to the Jeep Trail as described above for Alternative 1 would be constructed. It is estimated that access improvements for Jeep Trail and the new road between the Jeep Trail and the Dam for Alternative 2 would require 4,250 cubic yards of material. Delivered over a 60 day period in 18 cubic yard trucks, an average of five inbound loads per day, or 10 truck haul round trips per day would be required to import the material for road improvements. With 15 employees on the site during Phase 1, total trip generation during Phase 1 would be 70 vehicle trips per day.

The sediment disposal plan proposed in the Draft EIR/EIS would have intersected and cut off the Jeep Trail that leads to the Stone Cabin, denying access beyond the site during construction (two years). However, as discussed in Chapter 3, the disposal site (4R) has been moved uphill and a conveyor overcrossing would be provided to avoid any impact on access to the cabin via the Jeep Trail during construction.

Table 4.9-6: Alternative 2 (Dam Removal) Trip Generation

GENERATOR	DAILY TRAFFIC GENERATION	AM PEAK HOUR				PM PEAK HOUR			
		PEAK HOUR VOLUME	% OF DAILY	INBOUND	OUTBOUND	PEAK HOUR VOLUME	% OF DAILY	INBOUND	OUTBOUND
VEHICLE TRIPS									
VEHICLE TRIPS PHASE 1 (Year 1)									
Employee Trips	60	17	28%	15	2	17	28%	2	15
Truck Trips	10	2	20%	1	1	2	20%	1	1
Total Trips	70	19	27%	16	3	19	27%	3	16
VEHICLE TRIPS PHASE 2 - (Year 2-4)									
Employee Trips	240	42	18%	38	4	61	25%	23	38
Truck Trips	0	0	-	0	0	0	-	0	0
Total Trips	240	42	18%	38	4	61	25%	23	38
PASSENGER CAR EQUIVALENCIES									
PCE's PHASE 1 (Year 1)									
Employee Trips	60	17	28%	15	2	17	28%	2	15
Truck Trips	40	8	20%	4	4	8	20%	4	4
Total Trips	100	25	25%	19	6	25	25%	6	19
PCE's PHASE 1 (Year 2-4)									
Employee Trips	240	42	18%	38	4	61	25%	23	38
Truck Trips	0	0	-	0	0	0	-	0	0
Total Trips	240	42	18%	38	4	61	25%	23	38

NOTES:
PCE's = Passenger Car Equivalent

Phase 2 would require three years to complete, which would primarily consist of sediment transfer operations. Sediment transfer would be accomplished in two shifts. For the trip generation analysis, 45 workers were split between the day and swing shift for sediment transfer. An additional 15 workers were assigned to the day shift. On this basis, 240 trips would be generated per day during Phase 2.

Table 4.9-1 shows the assignment of Alternative 2 project daily trips to the study road segments and the road segment levels of service. With Alternative 2 traffic added to the road network, the existing road segment levels of service would not be changed.

Use of the Jeep Trail and conveyor road under Alternative 2 is estimated as follows:

- Project worker access during construction (all year during the first construction season and May to October during the following two seasons) on the Jeep Trail that passes by the Stone Cabin and then to the conveyor road (once constructed).

- Mobilization of conveyor equipment during the first and fourth seasons, resulting in roughly 150 trips over 2 to 3 month for each mobilization.

- Mobilization of heavy earth moving and construction equipment (roughly 20 to 40 trips of large equipment) at the beginning and end of each construction season (May and October) for 4 seasons, averaging 2 to 3 loads per day for the first and last month of construction.

- Occasional (bi-weekly) mid-size equipment mobilization (e.g., equipment/supply trucks, cranes, backhoes, and small dozers).

The Jeep Trail would be used for employee access throughout the construction period and for the delivery of conveyor equipment and other construction equipment. During the peak construction activity, it is estimated that 240 vehicle trips per day would be generated by Alternative 2. Most of the vehicles would travel on the Jeep Trail between Cachagua Road and the new reservoir access road/conveyor road. The 20-foot wide sections of the Jeep Trail would be adequate for two-way travel. Turnouts would be provided along the sections of the Jeep Trail that would be limited to one-way travel to enhance two-way operations.

As in Alternative 1, non-project related traffic using the Jeep Trail would be subjected to delays during the construction of improvements to the Jeep Trail. As additionally described for Alternative 1, the impact of the project during the construction of improvements to the Jeep Trail would be significant because it is not known if the amount of delay that a motorist would experience during the road construction period would be less than 10 minutes.

Similarly to Alternative 1, during mobilization periods, heavy earth moving equipment, construction equipment and the conveyor system would be transported by truck to and from the reservoir. Traffic movements on the Jeep Trail would be controlled by flagmen when large trucks are transporting equipment to and from the project. The delay experienced by non-project traffic would be less than 10 minutes and, therefore, the delay would not be a significant impact under Alternative 2.

As in Alternative 1, a Construction Management Plan would be developed for the Jeep Trail that includes a Trip Reduction Plan for Construction Workers, Traffic Coordination and Communication Plan and a Safety Plan for Alternative 2. The CMP would include measures to minimize the delay to non-project related Jeep Trail users during construction of improvements to the road and during subsequent project activities. It is not known whether delays to non-project related users could be reduced to less than 10 minutes during the construction of improvements to the trail during road improvements. Therefore, the impact of Alternative 2 to Jeep Trail users would be significant and unavoidable. Impacts during the construction of improvements to the Jeep Trail could be reduced to less than significant levels if the Communication Plan includes procedures that allow the other users of the Jeep Trail to provide the construction contractor with a schedule for their use of the Jeep Trail. Construction activities could then be planned to minimize delays to the other users of the Jeep Trail.

MITIGATION

Mitigation would be the same as described for Alternative 1.

Issue TC-2: Intersection Traffic Operations

Changes to intersection level of service
Determination: ***less than significant, no mitigation required***

IMPACT

The peak hour trip generation during Phase 1 of Alternative 2 would 19 trips during the AM and PM peak hours. The peak hour trip generation during Phase 2 of Alternative 2 would be 42 trips during the AM peak hour and 61 trips during the PM peak hour.

Figure 4.9-7 shows the assignment of AM and PM peak hour trips generated by the Alternative 2 project to the study intersection. The passenger car equivalent trip generation estimate figures for year two of Phase 2 were used in this analysis. A trip distribution pattern of 95 percent to the west and 5 percent to the east was assumed for the project. Five percent of the peak hour traffic was assigned to San Clemente Drive and 95 percent was assigned to Cachagua Road.

Alternative 2 AM and PM peak hour intersection volumes were achieved by combining the AM and PM peak hour traffic assignment for the project with the existing intersection volumes. The Alternative 2 AM and PM peak hour volumes are shown on Figure 4.9-8.

The Alternative 2 AM and PM peak hour intersection levels of service are summarized in Table 4.9-2. With traffic from Alternative 2 Project added to the study intersections, intersection levels of service would be unchanged from existing conditions. Based on the Existing Plus Alternative 2 traffic volume forecasts, left turn and right turn channelization would not be required at the Camel Valley Road intersection with the Cachagua Road.

MITIGATION

Mitigation measures for Issue TC-2 would not be required under Alternative 2.

Issue TC-7: Pavement Loadings

Effect of project traffic on pavement
Determination: ***less than significant with mitigation, short-term***

IMPACT

Alternative 2 would generate an estimated 544 truck trips over the duration of the project. Over a 10-year design period, the project would generate an average of 0.21 truck trips per day, which would generate 720 equivalent single axle loads (ESALs). With the Alternative 2 traffic loadings added to the existing ambient loadings on Carmel Valley Road, the total ESALs would increase to 72,032, which equates to a TI of 6.6. The TI would not change with the additional loadings generated by Alternative 2.

It is estimated that Cachagua Road is subject to the application of 26,182 ESALs over a 10-year period based on the existing ADT of 760 vehicles per day and assuming 1 percent trucks on this segment of Cachagua Road. The existing truck loadings equate

to a Traffic Index (TI) of 5.8. With the Alternative 2 traffic loadings added to the existing ambient loadings, the total ESALs would increase to 26,903, which equates to a TI of 5.9. The TI would change with the additional loadings generated by the Alternative 2.

Figure 4.9-7: AM and PM Alternative 2 (Dam Notching) Trip Assignment

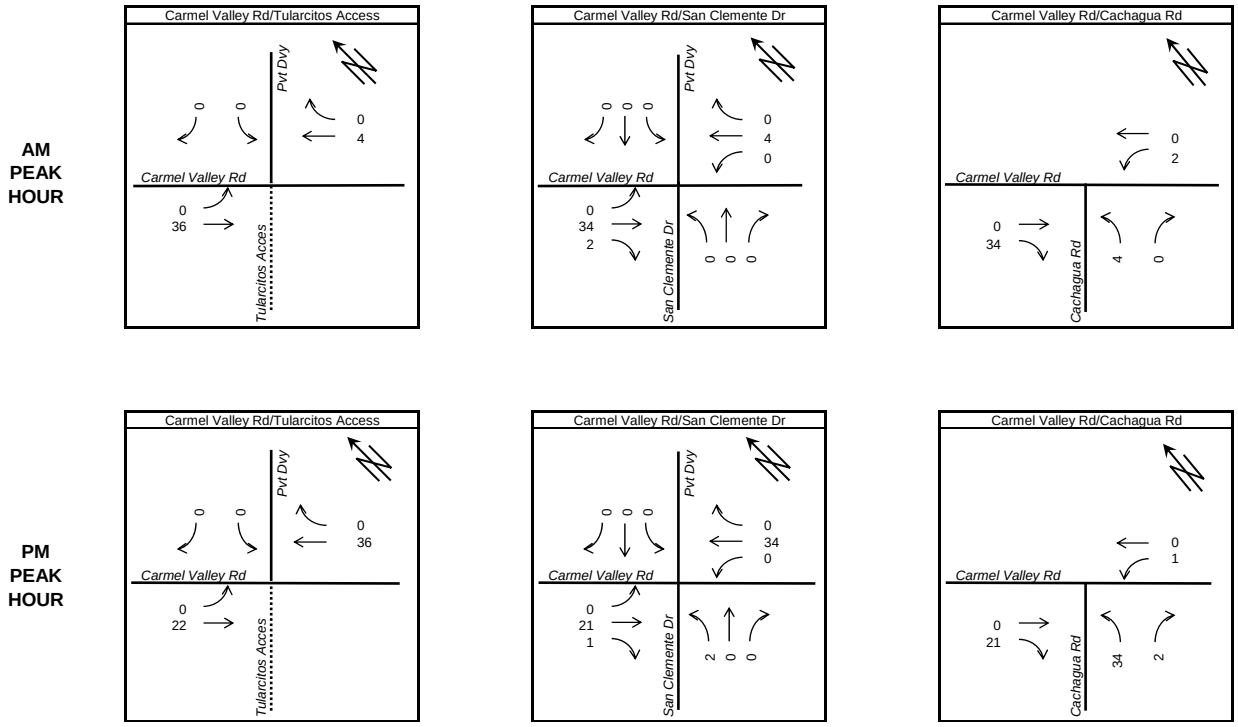
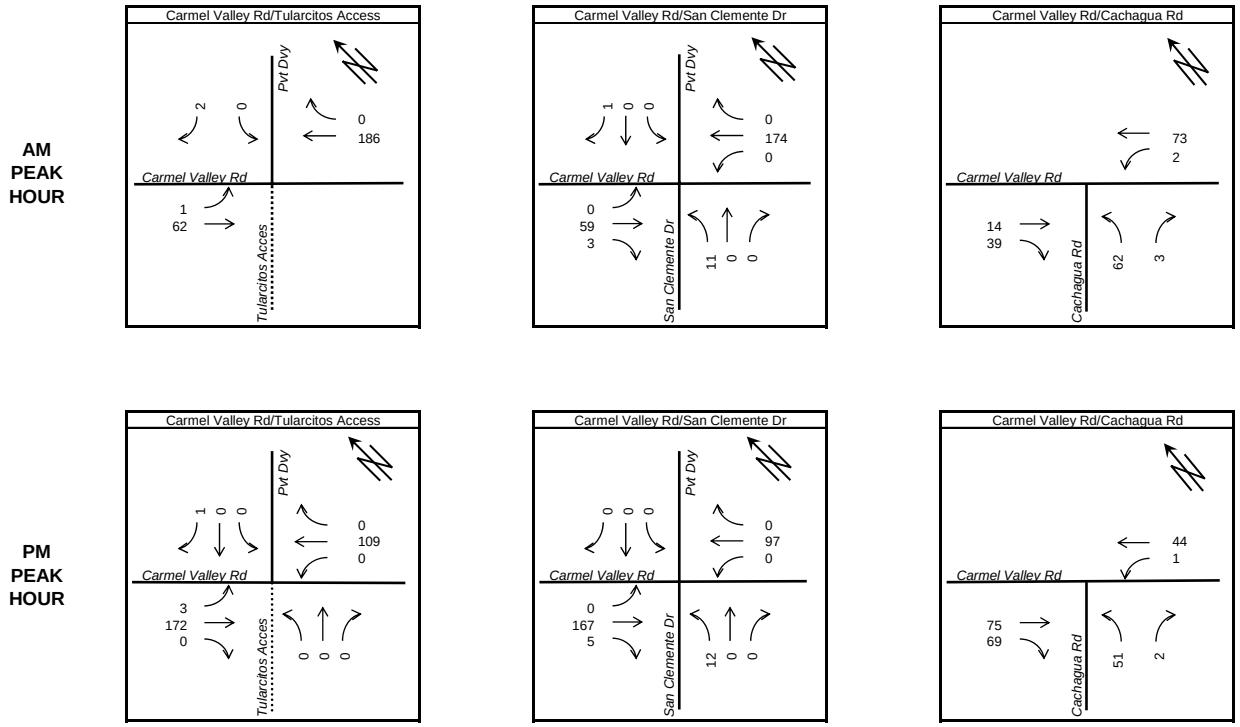


Figure 4.9-8: Existing Plus Alternative 2 AM and PM Peak Hour Intersection Volumes



Alternative 2 would also add additional traffic loadings to San Clemente Drive. Based on Monterey County pavement design standards, San Clemente Drive should be designed with a TI of 3.8 or greater. It would require over 100 large truck trips on San Clemente Drive to add the traffic loadings that would increase the TI by 0.1. The number of large truck trips added to San Clemente Drive would not approach the number of truck loadings required to change the TI.

MITIGATION

Mitigation would be the same as described for Alternative 1.

Alternative 3 (Carmel River Reroute and Dam Removal)

Traffic and Circulation impacts and mitigation measures for Issues TC-3a (Traffic Safety Carmel Valley Road), TC-3b (Traffic Safety San Clemente Drive), Issue TC-4 (Inadequate Corner Sight Distances), and TC-6 (Neighborhood Quality of Life) would be the same as discussed for Alternative 1. Impact TC-5 (New Intersections) would not apply, as there would be no new intersections.

Issue TC-1: Road Segment Traffic Operations

Additional traffic on area road network
*Determination**: significant, unavoidable, short-term***

IMPACT

The Alternative 3 trip generation statistics are summarized in Table 4.9-6. Employee data for each phase of the Alternative 3 construction project is provided in Section 3.5. Phasing and information regarding access road improvements is also provided in Section 3.5.

Table 4.9-6: Alternative 3 (Carmel River Re-route and Dam Removal) Trip Generation

		AM PEAK HOUR				PM PEAK HOUR			
GENERATOR	DAILY TRAFFIC GENERATION	PEAK HOUR VOLUME	% OF DAILY	INBOUND	OUTBOUND	PEAK HOUR VOLUME	% OF DAILY	INBOUND	OUTBOUND
VEHICLE TRIPS									
VEHICLE TRIPS PHASE 1 (Year 1)									
Employee Trips	60	17	28%	15	2	17	28%	2	15
Truck Trips	8	2	25%	1	1	2	25%	1	1
Total Trips	68	19	28%	16	3	19	28%	3	16
VEHICLE TRIPS PHASE 2 - (Year 2-4)									
Employee Trips	160	22	14%	20	2	40	25%	20	20
Truck Trips	0	0	-	0	0	0	-	0	0
Total Trips	160	22	14%	20	2	40	25%	20	20
PASSENGER CAR EQUIVALENCIES									
PCE's PHASE 1 (Year 1)									
Employee Trips	60	17	28%	15	2	17	28%	2	15
Truck Trips	32	8	25%	4	4	8	25%	4	4
Total Trips	92	25	27%	19	6	25	27%	6	19
PCE's PHASE 1 (Year 2-4)									
Employee Trips	160	22	14%	20	2	40	25%	20	20
Truck Trips	0	0	-	0	0	0	-	0	0
Total Trips	160	22	14%	20	2	40	25%	20	20

NOTES:
PCE's = Passenger Car Equivalent

The amount of aggregate that would be required to improve the Jeep Trail and the new road between the Jeep Trail and the Dam would be less than required for Alternatives 1 and 2, because the new road would be constructed to a 15-foot width for Alternative 3, rather than the 25 foot width required for Alternatives 1 and 2. It is estimated that access improvements for Jeep Trail and the new road between the Jeep Trail and the Dam for Alternative 2 would require 3,750 cubic yards of material. Delivered over a 60 day period in 18 cubic yard trucks, an average of 4 inbound loads per day, or 8 truck haul round trips per day would be required to import the material for road improvements. With 15 employees on the site during Phase 1, total trip generation during Phase 1 would be 68 vehicle trips per day.

Phase 2 would require three years to complete, with 40 workers split between two shifts. On this basis, 160 trips would be generated per day during Phase 2.

Table 4.9-1 shows the assignment of Alternative 3 project daily trips to the study road segments and the road segment levels of service. With Alternative 3 traffic added to the road network, the existing road segment levels of service would not be changed.

Under Alternative 3, access improvements to the Jeep Trail as described for Alternative 1 would be constructed, except that the new road constructed from between the Jeep Trail and the reservoir would be constructed to a width of 15 feet, not 25 feet. The new road would only be used by construction personnel and not other property owners.

The Jeep Trail would be used for employee access throughout the construction period and for the delivery of construction equipment. Alternative 3 would entail use of the Jeep Trail and new road connecting the Jeep Trail to the reservoir (following the same alignment as would be used for the conveyor road under Alternatives 1 and 2). Levels of use under Alternative 3 are estimated as follows:

- Project worker access during construction (all year during the first construction season and May to October during the following two seasons) through the Jeep Trail that passes by the Stone Cabin and then, once constructed, to the conveyor road.

- Mobilization of heavy earth moving and construction equipment (roughly 20 to 40 trips of large equipment) at the beginning and end of each construction season (May and October) for 3 seasons, averaging 2 to 3 loads per day for the first and last month of construction.

- Occasional (bi-weekly) mid-size equipment mobilization (e.g., equipment/supply trucks, cranes, backhoes, and small dozers).

During the peak construction activity, it is estimated that 160 vehicle trips per day would be generated by Alternative 3, most of which would use the Jeep Trail between Cachagua Road and the new access road to the reservoir. The 20-foot wide sections of the Jeep Trail between Cachagua Road and the new access road to the reservoir would be adequate for two-way travel. Turnouts would be provided along the sections of the Jeep Trail that would be limited to one-way travel. During the movement of large trucks into and out of the site via the jeep trial, flagmen with radios would be used to control traffic movements on the Jeep Trail.

As with Alternatives 1 and 2, non-project related traffic using the Jeep Trail would be subjected to delays during the construction of improvements to the Jeep Trail. As described for Alternatives 1 and 2, the impact of the project during the construction of improvements to the Jeep Trail would be significant because it is not known if the amount of delay that a motorist would experience during the road construction period would be less than 10 minutes.

During mobilization periods, heavy earth moving equipment and construction equipment would be transported by truck to and from the reservoir. Alternative 3 does not include the use of a conveyor system. As described for Alternative 1, during project operations

following the completion of improvements to the Jeep Trail, the delay experienced by non-project traffic on the Jeep Trail while large trucks are traversing the trail is estimated to be less than 10 minutes and, therefore, the delay would not be a significant impact under Alternative 3.

As with Alternatives I and 2, a Construction Management Plan would be developed for the Jeep Trail that includes a Trip Reduction Plan for Construction Workers, Traffic Coordination and Communication Plan and a Traffic Safety Plan for Alternative 3. The CMP would include measures to minimize the delay to non-project related Jeep Trail users during construction of improvements to the road and during subsequent project activities. Because it is not known whether delays to non-project related users could be reduced to less than 10 minutes during the construction of improvements to the trail, the impact of Alternative 3 to Jeep Trail users would be significant and unavoidable. Impacts during the construction of improvements to the Jeep Trail could be reduced to less than significant levels if the Communication Plan includes procedures that allow the other users of the Jeep Trail to provide the construction contractor with a schedule for their use of the Jeep Trail. Construction activities could then be planned to minimize delays to the other users of the Jeep Trail.

MITIGATION

Mitigation would be the same as described for Alternative 1.

Issue TC-2: Intersection Traffic Operations

Changes to intersection level of service
Determination: ***less than significant, no mitigation required***

IMPACT

Alternative 3 would generate 19 trips during the AM and PM peak hours during Phase 1 and 22 trips during the AM peak hour and 40 trips during the PM peak hour during Phase 2. For intersection capacity and channelization analyses, the peak hour truck trips generated by the Alternative 3 project were converted to passenger car equivalent trips to account for the greater impact associated with each truck in the vehicle stream. Consistent with previous traffic analyses prepared for the project; four passenger car equivalents (PCEs) were assumed per truck.

Figure 4.9-9 shows the assignment of AM and PM peak hour trips generated by the Alternative 3 project to the study intersection. The passenger car equivalent trip generation estimates for Phase 2 were used in this analysis. A trip distribution pattern of 95 percent to the west and 5 percent to the east was assumed for the project. Cachagua Road would be the primary access to the Dam for Alternative 3 and 95 percent of the traffic generated by the project was assigned to Cachagua Road.

Alternative 3 AM and PM peak hour intersection volumes were achieved by combining the AM and PM peak hour traffic assignment for the project with the existing intersection

volumes. The Alternative 3 AM and PM peak hour intersection volumes are shown on Figure 4.9-10.

Figure 4.9-9: Alternative 3
(Carmel River Re-route and Dam Removal)
AM and PM Peak Hour Trip Assignment

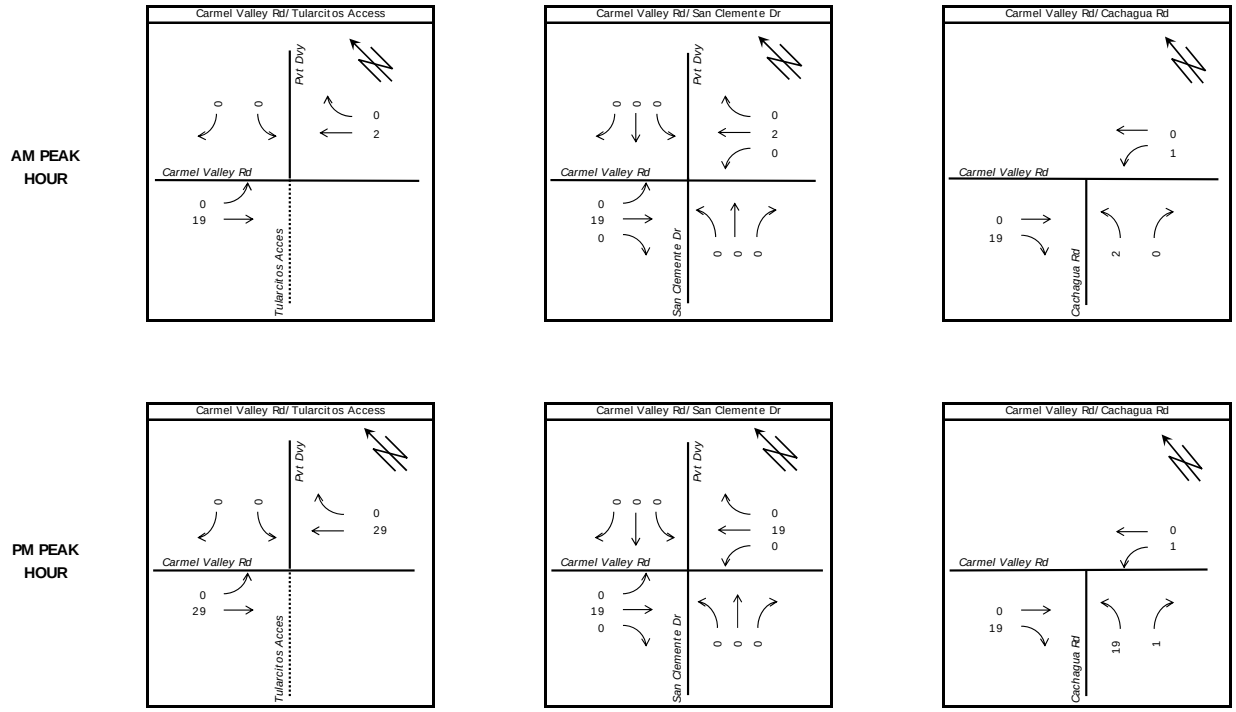
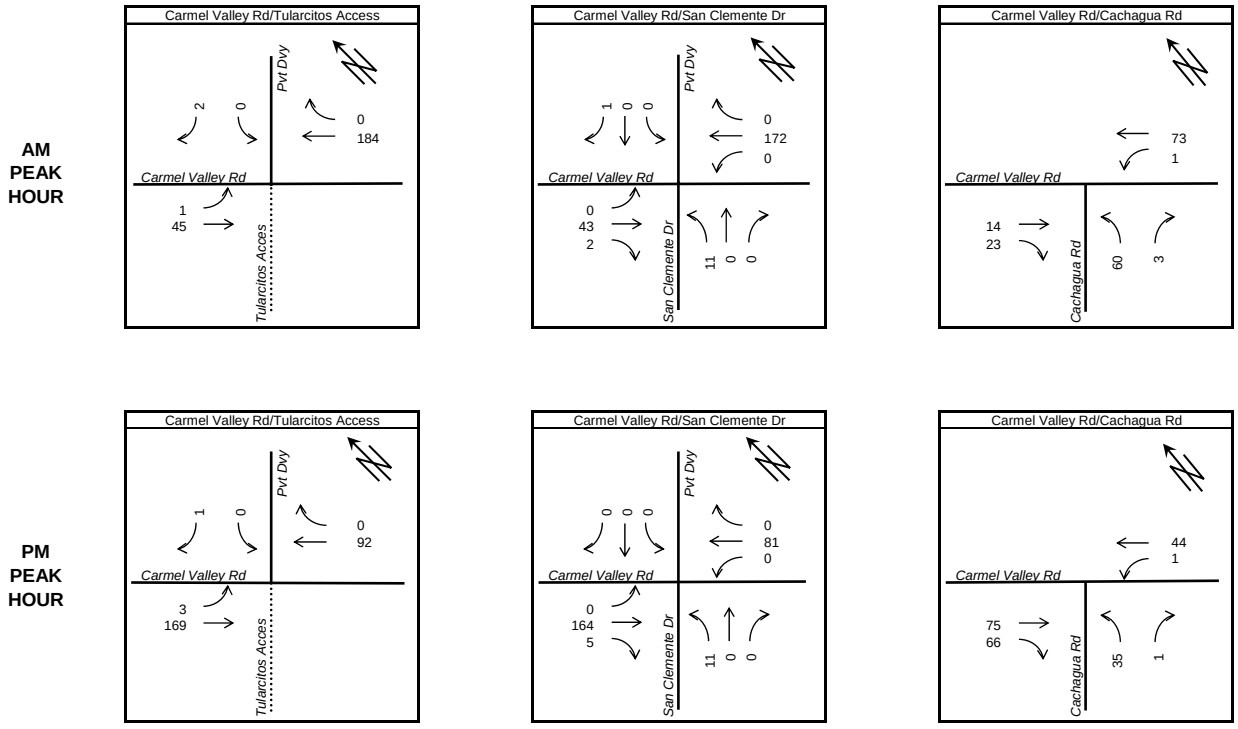


Figure 4.9-10: Existing Plus Alternative 3 AM and PM Peak Hour Intersection Volumes



Alternative 3 intersection operations were evaluated based on technical procedures documented in the 2000 HCM. The Alternative 3 AM and PM peak hour intersection levels of service are summarized in Table 4.9-1. With the traffic from project Alternative 3 added to the study intersections, intersection levels of service would be unchanged from existing conditions.

MITIGATION

Mitigation for TC-6 would not be required under Alternative 3.

Issue TC-7: Pavement Loadings

Effect of project traffic on pavement

Determination: ***less than significant with mitigation, short-term***

IMPACT

Alternative 3 would generate an estimated 480 truck trips over the duration of the project. Over a 10-year design period, the project would generate an average of 0.18 truck trips per day, which would generate 636 equivalent single axle loads (ESALs). With the Alternative 3 traffic loadings added to the existing ambient loadings on Carmel Valley Road, the total ESALs would increase to 77,460, which equates to a TI of 6.6. The TI would not change with the additional loadings generated by the Alternative 3.

The existing truck loadings on Cachagua Road equate to a TI of 5.8. With the Alternative 3 traffic loadings added to the existing ambient loadings, the total ESALs would increase to 26,818, which equates to a TI of 5.9. The TI would change with the additional loadings generated by the Alternative 3.

Alternative 3 would also add additional traffic loadings to San Clemente Drive. Pavement loading impacts to San Clemente Drive for Alternative 3 would be the same as the impacts described for Alternative 2.

MITIGATION

Mitigation would be the same as described for TC-7 in Alternative 1.

Alternative 4 (No Project)

No contruction activities are associated with the No Project Alternative; therefore there would be no additional impacts an

4.10 CULTURAL RESOURCES

This section describes the effects on cultural resources of the Proponent's Proposed Project and its alternatives during construction and operations for the project site, maintenance areas and immediate surroundings. Additional information provided in this Final EIR/EIS clarifies and amplifies the information included in the Public Draft EIR/EIS. The cultural resources analysis describes short- and long-term effects that would result from construction, demolition, or operation of the Dam, reservoir, and associated infrastructure.

Cultural resources include historic properties that are archaeological sites or historic structures. Archaeological sites date from approximately 12,000 BC through the historic period, which can be as recent as AD 1950. In accordance with the California Office of Historic Preservation's (OHP) California Register of Historical Resources (CRHR) standard, under CEQA, historic structures must be at least 45 years old. These two types of historic properties are addressed separately in this section because the resources are affected differently by project construction and operations. Under Section 106 of the National Historic Preservation Act (NHPA), federal agencies must consider effects on historic properties. "Historic properties" are defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register of Historic Places" (NRHP) (36 CFR 800.16). The term includes artifacts, records, and remains that are related to and located in such properties. It also includes "traditional cultural properties" (TCPs) that are eligible for inclusion on the NRHP.

The California State Parks Office of Historic Preservation administers the State's NRHP program under the direction of the State Historic Preservation Officer (SHPO). The following NRHP criteria serve as the basis for evaluating a historic property's eligibility for listing (36 CFR 60):

- Quality of significance in American history, architecture, archeology, and culture for districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association.

- Association with events that have made a significant contribution to the broad patterns of our history or embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, and/or represent a significant and distinguishable entity whose components may lack individual distinction.

- Whether the property has yielded or may be likely to yield information important in prehistory or history.

- Resources less than 50 years old do not meet the NRHP criteria unless they are of exceptional importance.

Consideration of effects must include the Area of Potential Effect (APE). The APE includes the "geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." The intent of the federal Executive Order (EO) 11593, Protection and Enhancement of the Cultural Environment has been integrated into Section 110 through 1980 amendments to the Act. Under NEPA, Federal agencies must take into account impacts to historical resources, or those resources that are eligible for the NRHP, before a project is approved. The Section 106 process has been integrated with the NEPA process for this project.

Recent amendments to Section 106 of the NHPA specify that properties of traditional religious and cultural importance to a Native American Tribe, also known as TCPs, may be determined to be eligible for inclusion on the NRHP. In carrying out its responsibilities under Section 106, the USACE is required to consult with any Native American tribe that may attach religious or cultural significance to any such properties.

Criteria for Evaluation of Historic Properties

Federal

The NRHP is the federal list of historic, archaeological, and cultural resources worthy of preservation. Resources listed in the NHRP include districts, sites, buildings, structures, and objects that are significant in American history, prehistory, architecture, archaeology, engineering, and culture. The quality of significance in American history, architecture, archaeology, and culture is possible in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association, and meet one of the following criteria:

Criterion A: Are associated with events that have made a significant contribution to the broad patterns of our history; or

Criterion B: Are associated with the lives of persons significant in our past; or

Criterion C: Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

Criterion D: Has yielded, or may be likely to yield, information important in prehistory or history (36 CFR Part 60).

Archaeological sites are primarily assessed under Criterion D. Buildings less than 50 years old do not meet the NRHP criteria unless they are of exceptional importance, as described in the National Park Service (NPS) Bulletin No. 22, "*How to Evaluate and Nominate Potential National Register Properties That Have Achieved Significance within the Last 50 Years*."

State

Regulatory compliance in relation to cultural resources is governed by CEQA. CEQA guidelines define a significant cultural resource as "a resource listed in or eligible for listing on the CRHR". A historical resource may be eligible for inclusion in the CRHR if it is 45 years of age and:

- **Criterion 1**: Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- **Criterion 2**: Is associated with the lives of persons important in our past;
- **Criterion 3**: Embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of an important creative individual, or possesses high artistic values; or
- **Criterion 4**: Yields, or may be likely to yield, information important to prehistory or history.

4.10.1 ENVIRONMENTAL SETTING

Archaeological Sites

No previously unrecorded cultural resources were located during the survey. Two archaeological sites are located within 500 feet of the APE. CA-MNT-942 is a bedrock mortar and CA-MNT-1252H is the remains of a wood cabin. Because the resources are outside the APE, no attempt was made to relocate them. Table 4.10-1 includes a list of the archaeological resources that were inventoried in the APE for the Proponent's Proposed Project.

Table 4.10-1: Inventoried Archaeological Resources for Proponent's Proposed Project (APE)

Field Site Numbers	Resource Name (Previously Assigned Site number)	Historical Significance	Relevant inventoried NRHP/CRHR* Criteria or Reason for Omission
AR-1	Occupation Site CA-MNT-33A and CA-MNT-33B	Eligible	NRHP Criterion D CRHP Criterion 4
AR-2	Bedrock Mortar Feature CA-MNT-586	Ineligible	Site removed or destroyed
AR-3	Cabin & Outhouse CA-MNT-814H	Ineligible	Cabin demolished
AR-4	Two Bedrock Mortar Features CA-MNT-1253	Unknown	Testing Required

* NRHP = National Register of Historic Places; CRHR = California Register of Historic Resources

CA-MNT-33A AND CA-MNT-33B (AR-1)

Initially discovered as early as 1948, this site is situated along the bank of the Carmel River near the current CVFP. The site consists of two large midden areas separated by a small, possibly sterile, area. Constituents of the site include shell and faunal bone fragments, some of which appear to be burned, lithic tools, mortar fragments, pestles, metates, and other possibly ground stone milling tools. At least five bedrock mortar features have been located along the riverbank.

Previous investigations at the site have included a 1972 excavation of five test pits by the Monterey County Archaeological Society, reported by Howard (1974). The reporting, however, was very limited and no further data were available until Gerrit Fenenga (1988) studied a small sample of shell artifacts from the site. Fenenga employed Bennyhoff and Hughes' (1987) typology for his analysis. Fenenga found a large assortment of *Olivella biplicata* shell beads, ranging from spire-lopped to saucer shaped specimens. Fenenga's investigation found temporally diagnostic shell artifacts are present at CA-MNT-33A, which date to the early and middle portions of the Middle Period (2100 to 1500 BP). A radiocarbon sample obtained from one excavation unit, approximately 133cm below surface returned a date of 2285 ± 100 BP (WSU-2388). Therefore, it can be assumed that CA-MNT-33A was undoubtedly occupied during the early Middle Period and possibly before.

A dirt and gravel access road is located across a portion of the site. This road appears to have been in place since the original recordation of the site. Previous site records also report other disturbances to the surface including gardens and fencing. Currently, a dirt road crosses the recorded boundaries of the site, but no other structures are evident. No disturbance of subsurface deposits seems likely with the exception of the settling ponds and the previous excavation.

Based on ethnographic maps, CA-MNT-33 may be the site of the village *Socorronda,* reported by Spanish missionaries to be located within the upper Carmel River drainage.

This large village site has the potential to contain important information on the prehistoric inhabitants of the area. Therefore, the site is recommended eligible for listing on the NRHP and CRHP under Criteria, D and 4, respectively.

CA-MNT-586 (AR-2)

This site is a possible bedrock mortar feature near a historic homestead CA-MNT-814H adjacent to Tularcitos Creek. The site was initially recorded in 1974 (Farley et al. 1974) and has since been removed or destroyed. This site is not eligible for the NRHP or CRHR.

CA-MNT-814H (AR-3)

Originally the site of a cabin and ancillary buildings, the site was reported as deteriorating in 1974 (Farley et al 1974). The cabin was located on a sloping flat above

the west bank of Tularcitos Creek near a bridge crossing. A 1983 site record update reports that the cabin was bulldozed to make way for a new home built on Lismore Lane in 1979 (Jacques 1983). No evidence remained of the cabin or other structures. This site is not eligible for the NRHP or the CRHR.

Directly east of this site is the old location of the Tularcitos Guard Station, once used by the California Department of Forestry. The guard station was constructed after WWII. It was abandoned and buildings were removed during the 1980s (pers. comm. between Don Lingenfelter, CAW, and Brett Rushing, ENTRIX July 2005). A mortared river rock wall remains at this location and was not inventoried.

CA-MNT-1253 (AR-4)

Located on the peninsula at the confluence of San Clemente Creek and the Carmel River, the site consists of two bedrock mortar (BRM) features near the shoreline of the San Clemente reservoir (Westec 1983). Originally recorded as a single BRM, a subsequent survey found another BRM feature in the vicinity, which was added to the original site (Hampson 1987). The BRM features remain intact.

Although no artifacts have been located in association with the two features, the site area has never undergone a controlled archaeological testing program. Therefore, if the site could not be avoided, it would need to be tested to determine the nature and extent of any subsurface cultural deposit and to establish eligibility for the NRHP and CRHR.

Historic Structures

The inventory resulted in the identification of eight individual historic resources and one historic district. The individual resources included two dams and associated fish ladders, a filtration plant, two chemical treatment buildings, two dam keeper houses, and a Stone Cabin. Their association with the Monterey Division waterworks thematically links all identified resources except for the Stone Cabin. A district record form was subsequently created for the SCD Historic District.

A primary record form was also prepared for each individual building or structure within the historic district. A separate inventory form was prepared for the Stone Cabin (HR-8) because that resource is contextually linked with recreational resources. The historic district form notes the presence of historical pipelines connecting the reservoir to the CVFP and the historical access road, San Clemente Drive. Table 4.10-2 includes a list of the inventoried historic structures associated with the project and the alternatives within the APE.

Table 4.10-2: Inventoried Historical Structures

Field Site Number	Resource Name (Previously identified site number)	Historical Significance	Relevant NRHP/CRHR Criteria or Reason for Omission
HR-1	Chemical Building near Filtration Plant	HD* Contributing Resource	NRHP Criterion A CRHR Criterion 1
HR-2	Dam Keeper's House 2	HD Contributing Resource	NRHP Criterion A CRHR Criterion 1
HR-3	Filtration Plant	Non-Compatible Non-Contributing	Altered
HR-4	Old Carmel River Dam & Fish Ladder CA-MNT-1249H	HD Contributing Resource & Individually Eligible	NRHP Criteria A and C CRHR Criteria 1 and 3
HR-5	Dam Keeper's House 1 CA-MNT-1248H	Contributing Resource HD	NRHP Criterion A CRHR Criterion 1
HR-6	Chemical Building near reservoir	HD Contributing Resource	NRHP Criterion A CRHR Criterion 1
HR-7	SCD & Fish Ladder CA-MNT-1248H	HD Contributing Resource & Individually Eligible	NRHP Criteria A and C CRHP Criteria 1 and 3
HR-8	Stone Cabin CA-MNT-812	Individually Eligible Resource	NRHP Criterion C CRHR Criterion 3
HR-9	SCD Historic District	Eligible	NRHP Criterion A CRHR Criterion 1

Note: Historic resources are located within the Proponent's Proposed Project and alternatives.

CHEMICAL BUILDING FOR FILTRATION PLANT (HR-1)

This building is located directly west of San Clemente Drive just north of the Dam Keeper's Cottage 2. The building includes a small concrete block structure and storage tank enclosed by chain-link fences. The fenced area where the tanks are located has a concrete slab foundation and fencing along its perimeter. Another fenced area without a foundation is located to the east. A pipeline is located adjacent to the west side of the building (pers. comm. between David Norris, CAW Consulting Engineer and Marcia Montgomery (ENTRIX 2005b).

The CVFP was constructed by CAW's predecessor in 1947 in response to customer's complaints about water quality. This building was constructed during this same period for use as a chemical storage building.

The Chemical Building near the CVFP is eligible for the NRHP Criterion A and CRHR under Criterion 1 as a contributing resource to the SCD Historic District and dates to the secondary period of significance.

DAM KEEPER'S COTTAGE 2 (HR-2)

The SCD became the property of the California Water and Telephone Company by 1935 during a period when the region's population began to grow rapidly. From 1930 to 1950, the number of active water connections in the Monterey area more than doubled. In 1940, the California Water and Telephone Company built this house for a full-time caretaker at the San Clemente Reservoir to insure the protection of the supply

(Monterey Peninsula Herald 1940). By 1947 the CVFP was added in close proximity to the house and adjacent to the San Clemente Access Road.

This one-story wood-frame house has a low-pitched intersecting gable roof. An inset porch is located on the center of the front south elevation and is supported by a square wooden post. The house is clad with horizontal wood siding and board and batten siding in the gable ends. The composite shingle roof has slightly overhanging rafter ends. The west and east elevations are void of windows. The west elevation includes a brick chimney. Windows are wood-frame and double-hung. A white picket fence encloses the yard. A wood-frame detached two-car garage with a shed roof and board-and-batten siding is located to the east of the house. The house is still in use.

The Dam Keeper's Cottage 2 is eligible for the NRHP under Criterion A and for the CRHR under Criterion 1 as a contributing resource within the SCD Historic District and is from the secondary period of significance.

CARMEL VALLEY FILTER PLANT (CVFP) (HR-3)

The CVFP was constructed in 1947 to filter solids from the water. This was partially in response to customer complaints during heavy run-off periods. The plant was built on the Carmel River one mile below the SCD. Water from the reservoir was diverted through a 30-inch transmission main to two large steel tanks, where the water was filtered by forcing it through layers of sand and gravel. After leaving the filters it was chlorinated (a second time for the system) and fed into the water system (Management Team 1954). In 1954 the plant had 12 filter units, however in the following years, 14 and then 16 filter units were used.

Filtration processes and equipment have changed since the plant was constructed, requiring many changes to the facility. The CVFP currently includes a rectangular side gable building with eight horizontally oriented tanks lying above ground on the northeast side of the structure. The building has seven square windows spaced evenly under the eaves of the standing seam roof. Another metal roof and side gable building, slightly lower in height, extends further to the west. This addition has metal slider windows and a door set in a cement wall. Southeast of the building and tanks on the grass is a small wooden shed roof building with a door and larger front gable concrete building with a standing seam roof. Two vertically oriented tanks stand east of these two buildings. A chain link fence surrounds the entire complex. A cement path leads from the road and a gate to the concrete building and tanks. The 30-inch main enters the fenced area in the southeast corner. A 1947 photograph of the CVFP shows a 1.5 story steel frame shed open at the front and sides next to horizontal tanks.

This building is ineligible for the NRHP or CRHR and classified as a non-contributing resource within the historic district because it has been extensively modified and expanded in order to keep up with existing water treatment methods.

OLD CARMEL RIVER DAM (OCRD) AND ASSOCIATED FISH LADDER (HR-4)

The OCRD is a low embankment dam that is rock fill faced with coursed rubble masonry. It is eight feet thick at the base and four feet thick at the crest. Embankment dams were first used in California by gold miners in remote areas in the 1850s. They used explosives to create rockfill out of granite and the fill was held in place by logs. These dams were called rockfill, log-crib dams. Later rockfill dams were faced with masonry, concrete, asphalt and steel. Few have been built since the early 1900s (Jones & Stokes 1998). A cement fish ladder is located on the north end of the Dam. The gate and gate controls are located at the south end of the Dam (Archaeological Consulting 1987b).

A vehicular bridge supported by two large concrete columns was added after the original construction of the bridge. The bridge deck is wooden and the railing on the edge of the bridge is wooden. An abandoned road stretches from the OCRD along the east side of the river to the SCD.

The OCRD is eligible for the NRHP as a contributing resource to the SCD Historic District, dating to the primary period of significance. It is also individually eligible for the NRHP under Criteria A and C. It is eligible under Criterion C as a good example of gravity load masonry dam constructed during the period when dams were transitioning to concrete arch dams. It is associated with the events that have made a significant contribution to the economic development of the Monterey Division thereby making it eligible for the NRHP under Criterion A. It is also eligible for the CRHR under Criteria 1 and 3.

DAM KEEPER'S COTTAGE 1 (HR-5)

The Dam Keeper's Cottage 1 was previously inventoried as part of the SCD Guest Ranch Complex in 1983 (Jacques 1983). Historical records indicate that numerous buildings were erected at the west end of the Dam during the original construction of the Dam beginning in 1919. According to the previous inventory record these additional buildings became part of the Del Monte Properties San Clemente Guest Ranch, which operated from 1930 to 1965. In 1981 most of the buildings were demolished.

The Dam Keeper's Cottage 1 was constructed circa 1920. The small wood-frame house has a low-pitched gable roof and horizontal wood siding. The front entrance is centered on the south elevation. Wooden stairs lead to a small porch centered on the front of the house and sheltered by a shed roof. A large picture window is located to the west of the porch and there are two more windows on either side of the front door. The windows throughout the house are wood and metal frame. At the northwest corner of the house, the north and west elevations have two side-by-side four-over-four double-hung sash windows on the north and west elevations. A small shed-roof addition is located at the east end of the north elevation. A detached garage is located to the east of the house. To the north and west of the house is a mortared cobblestone wall and fire pit dating from the historic period.

The Dam Keeper's Cottage 1 is eligible for the NRHP under Criterion A and CRHR under Criterion 1 as a contributing resource within the SCD Historic District and is from the primary period of significance.

CHEMICAL BUILDING NEAR RESERVOIR (HR-6)

The Chemical Building near the reservoir was added west of the SCD in 1946-47 at the same time as the CVFP, for use as a storage facility for chemicals used to treat the reservoir water. Today, the building is used for general storage and houses equipment used in tracking seismic activity (pers. comm. between David Norris, consultant to CAW and Marcia Montgomery (ENTRIX 2005b). The Chemical Building is a Quonset hut and has a rectangular plan, corrugated metal siding, and a concrete foundation/basement level. Unlike a typical Quonset hut roof the arched form of the roof ends at the top of the wall on the east elevation, which is flat. The front or north elevation has wooden stairs leading to a three panel industrial wooden door on the west end of the building. A four-light awning window is located at the east end of the elevation. West of the window is a gasoline storage rack mounted to the building and to the east of the window is an electrical panel. The east elevation is corrugated metal and wooden siding with a door at the south end of the elevation. Concrete stairs and a small landing lead to the door. Because the building is sited on a hill the basement area below the landing is exposed and includes a door to access the basement level. The south elevation has corrugated metal siding on the upper level and concrete on the daylight basement level. Two four-light metal frame awning windows. The lower level also has two windows and a door.

The Chemical Building is eligible for the NRHP under Criterion A and CRHR under Criterion 1, as a contributing resource to the SCD Historic District and dates to the secondary period of significance.

SAN CLEMENTE DAM AND ASSOCIATED FISH LADDER (HR-7)

Lars Jorgensen, a leader in constant angle arch dam designing, and engineer J.A. Wilcox designed the SCD in 1919 to bridge the Carmel River. It was the first constant angle arch dam in California. Arch dams transmit water loads to the sides, rather than to the bottom, unlike gravity dams. (Jones & Stokes 1998). They are well adapted to narrow gorges and produce substantial savings in costs compared to the gravity dam. The basic arch dam shapes are the constant radius, the constant angle, and the double curvature arch. The constant angle arch is a variable radius arch; the arch radius increases from base to angle. The design is based on a constant central opening angle. Jorgensen demonstrated that the Dam contained minimum material for an optimum opening angle of 133.6 degrees (James 2000).

The Dam was designed to allow the floodwater to overflow the crest of the Dam, to increase its height ten feet, and to allow ten feet of water to overflow the entire top at its ultimate height (Wilcox 1918). Chadwick and Sykes completed the Dam measuring 106 feet high and 300 feet long at the crest in two years (Jones & Stokes 1998).

The top of the Dam was 85 feet above the streambed. The contractor's estimate included excavation, the reinforced concrete dam, a valve house, a water tower and control house, and a fish ladder on the downstream side of the Dam to assist steelhead traveling to upper waters (Chadwick and Sykes 1920). The fish ladder consists of twenty-four spillway gates and 23 pools that ascended 100 feet from the river at the base of the Dam to an opening in the west abutment of the Dam. The gates were timber, 13'6" x 6'4", specified to be cut from Puget Sound or Oregon forests (Chadwick and Sykes 1920).

The SCD is eligible for the NRHP and CRHR as a contributing resource to the SCD Historic District dating to the primary period of significance. It is also eligible for the NRHP under Criterion C and for the CRHR under Criterion 3 as the first example of a constant angle concrete arch dam in California. The Dam was constructed during the period when dams were transitioning to concrete arch dams.

STONE CABIN (HR-8)

The site consists of a restored stone and adobe-mortar cabin with associated rock walls, historic debris and stone cairns. Edwards/Hickman/Breschini previously recorded it in 1974 as a deteriorated Stone Cabin. Its new owners, a group of 10 investors, restored it for recreational use in 1978 to 1979. Westec Services updated the site inventory record in 1983. Archaeological Consulting recorded the archaeological site in 1987a.

The rectangular side-gable cabin faces due west towards the Carmel River. Its low slope roof with wooden shingles was replaced during its restoration. It has exposed rafter tails and two skylights. The cabin is constructed of uncoursed dressed stone. Original recordation notes adobe mortar flush with the stones, and previous reconstruction of the top half of the north and south walls. Cement mortar was used in its reconstruction. On the south end of the façade is a door constructed of vertical planks. The window north of the door is shuttered with three vertical planks. A (rebuilt) stone chimney runs up the south wall. Reconstructed flooring and benches are found in the interior.

Several 1920s Pebble Beach Company survey maps indicate "Murphy's Stone Cabin." Murphy is believed to be an earlier homesteader in the area. Murphy's Flat is named after Mike J. Murphy. A 1908 survey map places a corral directly north of the cabin. (Jacques 1983). Employees of Del Monte Properties used the cabin in the summer months in the 1920s but not as a year round residence. This building is eligible for the NRHP Criterion C and CRHR Criterion 3.

SAN CLEMENTE DAM (SCD) HISTORIC DISTRICT (HR-9)

The SCD Historic District includes resources within the Carmel River Valley south of the river's confluence with the Tularcito's Creek approximately 2.5 miles to the SCD. Contributing resources within the historic district fall into either the primary (1882 to

1935) or secondary (1935 to 1955) period of significance. The primary period of significance represents the early period of historical use during which the coastal communities that used the water from the Carmel River were growing due to the improved railroad transportation that spurred the agricultural, ranching, and tourism industries. The secondary period represents a later era of more widespread growth and a time in which new innovations such as water filtration and treatment were introduced, requiring the addition of new facilities in association with the waterworks. Contributing resources within the district are eligible for the NRHP (under Criterion A) and CRHR (under Criterion 1) for their historical association with the development of the Monterey Division waterworks, which contributed to the growth, development and economic expansion of the Monterey Peninsula. The contributing resources to the SCD Historic District collectively have historical significance for their association with the Pacific Improvement Company's development of a water system that directly affected the growth, development and economics of the Monterey Peninsula. The OCRD and SCD also have engineering significance.

2030 Baseline Conditions

The resources would continue to age through 2030, resulting in normal wear and tear on the resources. Regular maintenance of historic resources and replacement of in-kind historic materials, when necessary, would greatly lessen deterioration of the resources. Failure to maintain the resources in any form would result in more rapid degradation or deterioration of the resources. Archaeological resources, if undisturbed, would remain intact. Construction activities adjacent to or in the same area of the archaeological resources could damage or destroy the resources.

4.10.2 ENVIRONMENTAL RESOURCE IMPACT STANDARDS AND METHODS

Standards of Significance

In accordance with CEQA, SHPO, and professional standards, a project impact would normally be significant if the project would:

- Disrupt or adversely affect a prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group; or a paleontological site except as a part of a scientific study;

- Cause a substantial, adverse change in the significance of a historical resource as defined in § 15064.5 of the CEQA Guidelines;

- Cause a substantial adverse change in the significance of an archeological resource pursuant to § 15064.5 of the CEQA Guidelines;

- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature;

- Disturb any human remains, including those interred outside of formal cemeteries.

Impact Assessment Methodology

This assessment evaluates and identifies impacts over a range of temporal scales. The three temporal impact categories are:

- Temporary impacts that occur within the construction period, but do last throughout the period;
- Short-term impacts that occur within the construction period (concurrent with the number of construction seasons, which vary from one alternative to another);
- Long-term impacts that persist beyond the construction period.

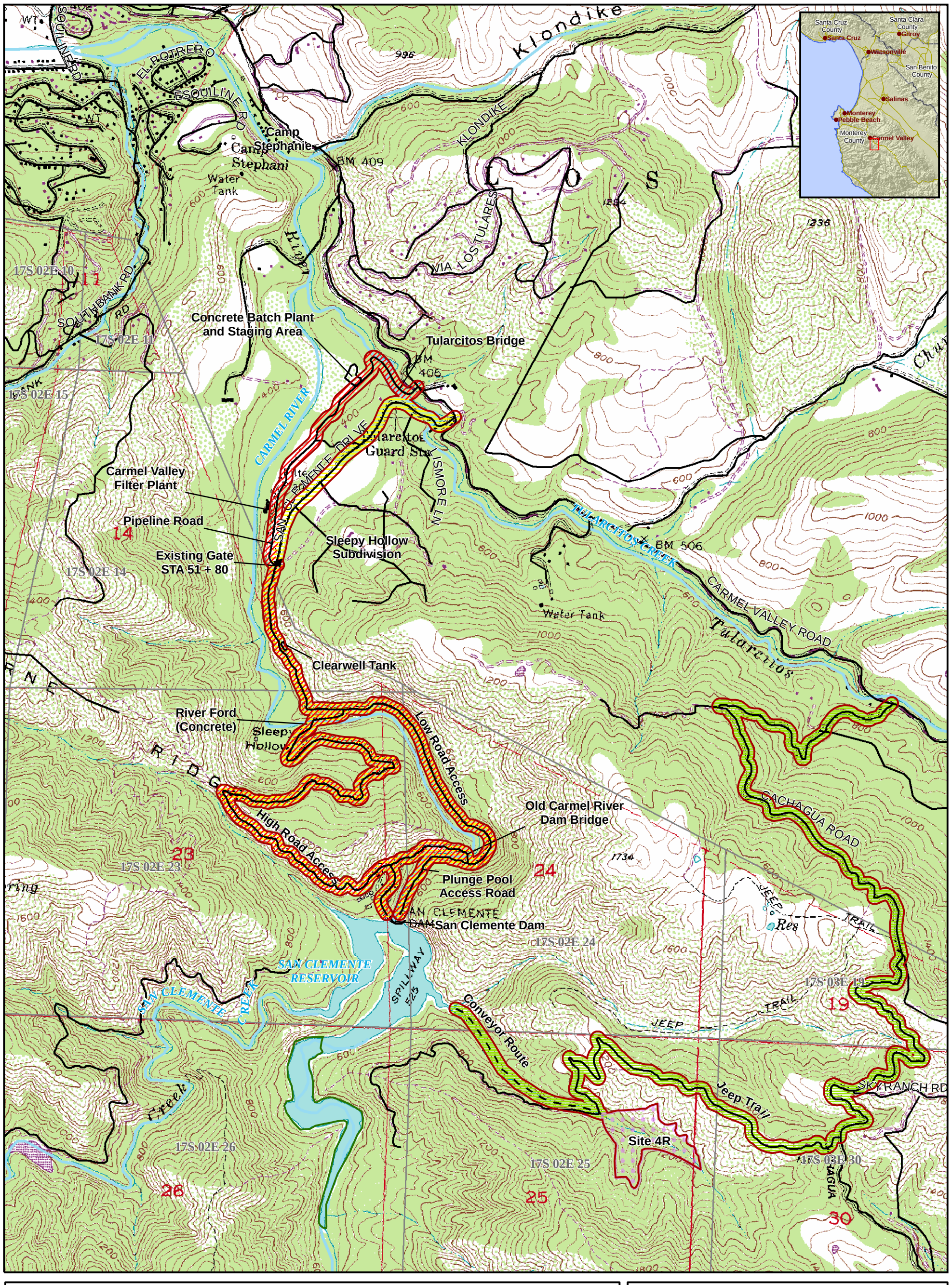
Determination of Area of Potential Effect (APE)

Following federal criteria, the eligibility of resources that are at least 50 years of age and are located within the APE or the "geographic area within which (the) undertaking may cause changes in the character of or use of historic properties" were evaluated (36 CFR 8002(c)). Per the California OHP, the threshold for historic resources, buildings and structures that were at least 45 years of age were also recorded. The APE accommodates short and long-term effects to historic resources as well as all potential ground-disturbing impacts to any archaeological resources. Below is a discussion of the APE for archaeological and historic resources, divided into three geographic areas within the project area. Figure 4.10-1 shows the APE in relation to the Project Area.

CACHAGUA/SITE 4R

The historic resource inventory includes an area of 100 feet in both directions from the edges of Cachagua Road, the Jeep Trail, and the conveyor route to the extent feasible depending on topography. In addition, the Site 4R was surveyed for 100 feet beyond the proposed boundaries.

The APE for archaeological inventory was limited to 100 feet from the centerline of the Jeep Trail and the conveyor route. Due to the steep topography and dense brush only the accessible portions of the conveyor route were surveyed. The boundaries of Site 4R constituted the archaeological APE in this area.



Legend

Access Routes

- Cachugua / 4R
- Sleepy Hollow
- Tularcitos

- Stream
- Existing Road
- Proposed Road
- Public Land Survey Section
- Sediment Disposal Site

- Archaeological Resource
- Historical Resource
- Archaeological and Historical APE
- Additional Historical APE

Projection: California State Plane, Zone IV
Datum: NAD 83 Units: Feet

San Clemente Dam EIS/EIR

Figure 4.10-1

APE Map

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SLEEPY HOLLOW AND SAN CLEMENTE DAM

The historic resource inventory included an area 100 feet in both directions from the edges of San Clemente Drive, including the loop and dam access roads to the extent feasible depending on topography. In addition, the SCD and associated facilities, the OCRD, and a water pipeline that parallels San Clemente Drive all are included within the APE. The shoreline of the original reservoir was surveyed.

The archaeological survey addressed three areas of the reservoir shoreline that would be affected by one or more alternatives. These include: the point where the conveyor route meets the shoreline, the access points for excavation equipment to be used for sediment removal, and the "saddle" between San Clemente Creek and the Carmel River that would be bisected to reroute the creek's water under one alternative. The balance of the upper reservoir was silted in to the extent that the original shoreline of the reservoir is now some distance from the reservoir waters, across vegetated dry land. The archaeological survey in these areas focused on lower slope landforms with the potential to contain archaeological materials. In addition, the APE included 50 feet in both directions from the edges of San Clemente Drive to the extent feasible depending on topography to account for potential impacts to resources from the proposed upgrading of this road.

TULARCITOS

Most of the areas described for existing access would be used under the Tularcitos option and the same APE applies to those. In addition, the currently unimproved Tularcitos access road (Figure 4.10-1) would be rebuilt to access a proposed concrete batch plant and staging area for the Proponent's Proposed Project. The historic resource inventory included an area 100 feet in both directions from the edges of this unimproved road, and in the area proposed for the batch plant and staging area.

The archaeological resources APE included all areas within 50 feet of the centerline of the unimproved road and 100 feet beyond the proposed boundaries of the batch plant and staging area location.

Archaeology Fieldwork

Prior to fieldwork, archaeologists gathered previously prepared historic property inventory forms for resources within the APE of the Proponent's Proposed Project from the Northwest Information Center of the California Historical Resources Information System.

Between June 27 and July 23, 2005, ENTRIX archaeologists conducted a pedestrian survey of the Proponent's Proposed Project APE. The field inventory consisted of pedestrian survey using generally parallel, meandering transects no more than 10 meters wide. Due to the heavy brush, poison oak, and steep terrain encountered at certain points of the alignment, approximately eight percent of the entire alignment was

not surveyed. Heavy brush and dense poison oak coverage prohibited a complete archaeological survey of the sediment disposal site and the proposed conveyor route. The omitted areas are characterized by greater than 10 percent slopes, (sometimes as high as 75 percent) and heavy brush. Therefore, the likelihood of encountering intact cultural material in these areas was determined to be low.

The survey was accomplished by walking parallel transects of 30 to 60 feet (10 to 20 meters). Ground visibility was good in the areas surveyed, with some obstruction from low-lying grasses and shrubs. All visible ground within the APE was inspected for cultural remains as well as any cut banks, bedrock outcrops, boulders, or exposed sediments.

The SCD and surrounding area have undergone intensive archaeological reconnaissance over the past three decades. During the inventory for this Proponent's Proposed Project, previously recorded sites were revisited and site records updated as necessary including photographs, GPS mapping and plotting, and current condition. When previously recorded sites were relocated, either an addendum to the site form was prepared or a new site form was completed to reflect any changes since the previous recording; site updates used the California Department of Parks and Recreation (DPR) site continuation forms (DPR 523l). During the field inventory, archaeologists visited two previously inventoried historic archaeological resources (CA-MNT-811H and CA-MNT-812H) located at the south end of the reservoir along the Carmel River. The historic archaeological resources were photographed and notes on the present condition of the resources were collected.

Historic Structures Fieldwork

Prior to fieldwork, architectural historians gathered previously prepared historic property inventory forms for resources within the Proponent's Proposed Project APE from the Northwest Information Center of the California Historical Resources Information System. Information on specific resources in the APE was obtained from CAW Engineer Don Lingenfelter and CAW Consulting Engineer David Norris.

The SCD Historic District is one portion of the larger CAW Monterey Division public water system that serves the Monterey Peninsula. In June 2005, ENTRIX Architectural Historians conducted a reconnaissance level historic resources inventory of the Proponent's Proposed Project APE to identify historical resources that appeared to be potentially eligible for the NRHP or the CRHR. ENTRIX identified resources that retained integrity and that shared a thematic association with the development of the Monterey Division water system. Architectural historians recorded physical features of each resource on inventory forms, mapped its location using GPS, and photographed the resource with black and white film and a digital camera.

An inventory form was prepared for the SCD Historic District, which identifies seven historical resources, including the OCRD and SCD, two dam keeper cottages, a

historical filtration plant, and two chemical treatment buildings. One additional resource, a Stone Cabin previously recorded as site CA-MNT-812, was also inventoried. This resource is located outside the boundary of the historic district. Figure 4.10-2 illustrates the location of each inventoried historical resource.

4.10.3 IMPACTS AND MITIGATION

Impact Issues

The issues potentially affecting historic properties regarding changes to the Dam and its associated facilities include the following:

- CR-1: Ground Disturbance (disturbance to archaeological sites)
- CR-2: Damage to Historic Structures from Construction-related vibration (construction related vibration)
- CR-3: Introduction of Temporary Dirt/Unintended Damage (construction/demolition-related accumulation of dirt)
- CR-4: Demolition or Alteration to the Historic Properties (alterations to the OCRD and associated fish ladder and to SCD)
- CR-5: Alteration to the Setting of Surrounding Environment (alter character of setting for SCD Historic Resource District)
- CR-6: Introduction of Visual Obstructions (loss of visual integrity for SCD Historic Resource District)

Proponent's Proposed Project (Dam Thickening)

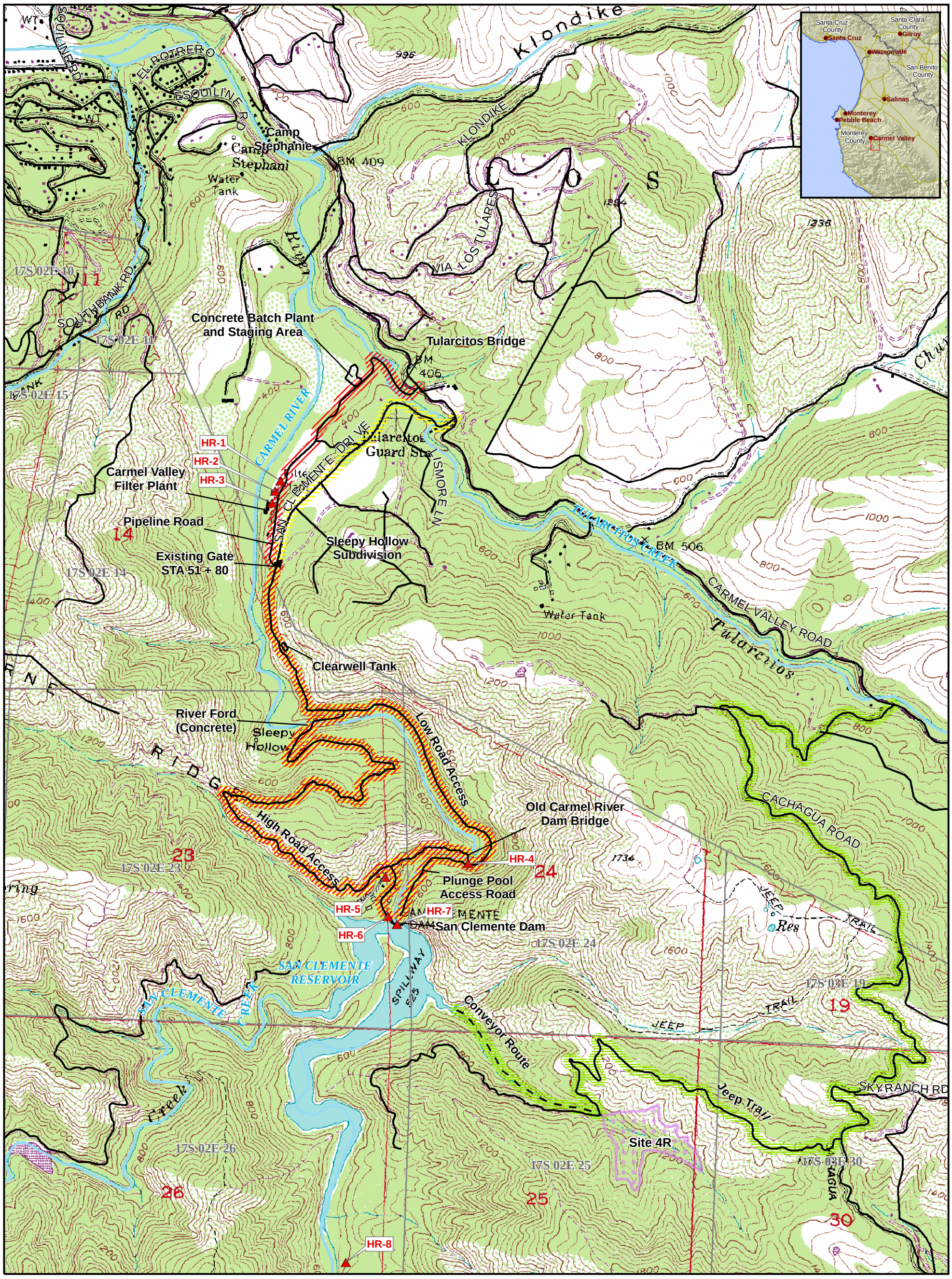
Issue CR-1: Ground Disturbance

Disturbance to archaeological sites
Determination: ***less than significant with mitigation, long-term***

IMPACT

A large village site (AR-1) extends on both sides of the Tularcitos Access Route just north of the CVFP. Any improvement or increased use of the current access road near the CVFP would damage or destroy the archaeological resource. CA-MNT-33A and B have been recommended eligible for listing on the NRHP. As portions of these sites within the APE are still intact, monitoring of construction activities at these sites is recommended to protect those portions from inadvertent damage. Ground disturbance would occur in the short-term and could have long-term effects and a significant and unavoidable impact. CA-MNT-1253 remains unevaluated.

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Legend

Access Routes

- Cachugua / 4R
- Sleepy Hollow
- Tularcitos
- Stream
- Existing Road
- Proposed Road
- Sediment Disposal Site
- Historical Resource
- Public Land Survey Section

Projection: California State Plane, Zone IV
Datum: NAD 83 Units: Feet

San Clemente Dam EIS/EIR

Figure 4.10-2

Inventoried Historic Resources

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Complete avoidance of the sites during construction and maintenance could mitigate the impact to a level less than significant.

Due to the extent of siltation behind the SCD within the APE, the likelihood of encountering surface evidence of archaeological deposits during field surveys was very low. Based on our understanding of the surrounding area and the presence of two archaeological sites within the APE along low benches above the San Clemente River, it is considered likely that archeological sites are present below the deposited sediment near the original river channel. However, since there would be no excavation of the overlying sediment behind the SCD under the Proponent's Proposed Project, there would be no potential for such excavation to impact previously undiscovered archaeological resources.

MITIGATION

As portions of these sites within the APE are still intact, monitoring of construction activities at these sites is recommended to protect those portions from inadvertent damage. One site, CA-MNT-33A and B (AR-1), has been recommended eligible for listing on the NRHP. Site CA-MNT-1253 (AR-4) remains unevaluated. Under CEQA, complete avoidance of the sites during construction and maintenance could mitigate the impact to a level less than significant.

If avoidance is not possible at these sites, archaeological evaluation and/or historical documentation are recommended to achieve a less than significant level of impact.

Pursuant to 36 CFR 800.13, if historic properties are discovered or unanticipated effects on historic properties are found after completion of the Section 106 process, the agency official shall make reasonable efforts to avoid, minimize or mitigate adverse effects to such properties. If buried cultural resources are discovered during the course of project activities, construction operations would immediately stop in the vicinity of the find and the federal lead agency would be notified. At the discretion of the agency, the undertaking may proceed, provided reasonable efforts are implemented to minimize harm to the resource until a determination of significance can be made. Cultural resources include artifacts of stone, bone, wood, shell, or other materials, or features, such as hearths, structural remains, or dumps.

In order to complete the Section 106 process, the mitigation measures would need to be incorporated into a Memorandum of Agreement (MOA). The MOA would include details about when the work would be done and the responsible parties. The agencies involved in the development of the MOA include the USACE, the SHPO, the Tribe, and CAW. The mitigation measures that are assumed to be a part of the MOA include:

- A comprehensive monitoring program would be implemented to ensure protection of archaeological sites within and adjacent to the APE for the Proponent's Proposed Project. Construction activities would be monitored within 200 feet of site or as determined by a qualified professional archeologist. According to tribal interviews

(pers. comm. Rudolph Rosales, Fred Nason July 20, 2005), the sediment disposal site may be an archaeologically sensitive area.

- For those areas not previously surveyed, particularly the sediment disposal site and the areas exposed by excavation behind the SCD, a monitoring program would be developed prior to construction as part of the MOA between SHPO and the consulting parties. Sediment removal would be monitored as excavation approaches intact native soils within 200 feet of the historic river channel.

- The archaeological monitoring program would include the following tasks:

  - Pre-construction assessment and construction training
  - Construction monitoring
  - Site recording and evaluation
  - Mitigation planning
  - Curation
  - Tribal discussion
  - Report of findings
  - Review and approve any erosion control and revegetation procedures in the vicinity of a known significant site prior to implementation of these procedures

Issue CR-2: Damage to Historic Structures from Construction-related Vibration

Construction-related vibration
Determination: ***less than significant with mitigation, short-term***

IMPACT

Construction activities could create temporary vibrations such that the Chemical Building near the Reservoir (HR-6), Dam Keeper's House 2 (HR-2), OCRD and associated Fish Ladder (HR-4), and the SCD and Associated Fish Ladder (HR-7) could be damaged due to the loosening of paint or mortar, cracking of mortar, breakage of windows, weakening of structural elements, and/or crumbling masonry. This impact is short-term. No long-term impacts are anticipated.

MITIGATION

Mitigation measures for this short-term impact would include using rigid support of excavation structures to minimize the movement of the ground.

Issue CR-3: Introduction of Short-term Dirt/Unintended Damage

Construction/demolition-related accumulation of dirt
Determination: ***less than significant with mitigation, short-term***

IMPACT

The accumulation of dirt on all contributing historic properties in the historic district, including the Chemical Building near Filtration Plant (HR-1), Dam Keeper's House 2 (HR-2), OCRD and associated Fish Ladder (HR-4), Dam Keeper's House 1 (HR-5), Chemical Building near Reservoir (HR-6), and the SCD and Associated Fish Ladder (HR-7), could result from construction activities and alteration/demolition of resources. This is a short-term impact. No long-term impacts are anticipated.

MITIGATION

Short-term dirt/unintended damage could occur to contributing historic properties within the historic district (Chemical Building HR-1, Dam Keeper's House 2 HR-2, Carmel River Dam HR-4, Dam Keeper's House 1 HR-5, Chemical Building HR-6, and SCD and Fish Ladder HR-7). Mitigation measures for this short-term impact would include reducing dust associated with construction activities by spraying water on the ground surface prior to ground disturbance. Section 4.7 Air Quality provides a more detailed discussion of dust reducing mitigation.

Issue CR-4: Demolition or Alteration to Historic Properties

Alterations to OCRD and associated fish ladder and to San Clemente Dam
Determination: ***significant, unavoidable, long-term***

IMPACT

The OCRD and Associated Fish Ladder (HR-4) would undergo alteration of property due to proposed improvements to access roads to SCD. The Proponent's Proposed Project would require structural improvements to the existing bridge that is placed on top of the embankment dam. The Proponent's Proposed Project would replace existing piers with stronger and more deeply set piers, which would alter the OCRD. The thickening of the SCD would modify the SCD and Associated Fish Ladder (HR-7). The original engineering design of the bridge would be altered through the application of approximately 8 feet of concrete on the east end of the downstream side of the Dam. This would result in a change to the Dam and fish ladder due to the alteration of a historic property. This is a significant and unavoidable long-term impact.

MITIGATION

In order to complete the Section 106 process, the mitigation measures would need to be incorporated into a MOA. The mitigation measures that are assumed to be included in the MOA are as follows.

- Mitigation measures for long-term impacts would include recordation of the resources (OCRD and associated Fish Ladder (HR-4) and the SCD and associated Fish Ladder (HR-7)). Recordation would be completed prior to any construction, in the form of an HABS/HAER level documentation, which follows NPS regulations.

- Additional mitigation could include interpretive displays, development of an educational program on the Dam and associated facilities, and professional publications on the historic resources.

While this mitigation is necessary to complete the Section 106 process, the mitigation measures would not reduce the impact to a less than significant level.

Issue CR-5: Alteration of Surrounding Environment

Alter character of setting for San Clemente Dam Historic Resource District
Determination: ***significant, unavoidable, long-term***

IMPACT

The Proponent's Proposed Project impacts for Issue CR-5 affect specific contributing resources, such as the OCRD (HR-4) and the SCD (HR-7), as stated above, would result in alteration to the character of the setting of significant historic resources of the SCD Historic District (HR-9). This is a significant and unavoidable long-term impact.

MITIGATION

Mitigation measures for long-term impacts include preparation of a National Register of Historic Places Nomination Form for the SCD Historic District (HR-9) and the completion of a Historic Preservation Management Plan, included in a MOA. However, this mitigation could not reduce the impact to a less than significant level.

Issue CR-6: Introduction of Visual Obstructions

Loss of visual integrity for San Clemente Dam Historic Resource District
Determination: ***significant, unavoidable, long-term***

IMPACT

Visual effects to the SCD Historic District (HR-9) and the alteration/demolition of individual historic resources within the district would adversely affect their visual integrity. This is a significant and unavoidable long-term effect.

MITIGATION

Mitigation measures for long-term impacts include photographic documentation of the historic resources prior to construction. Design, materials, and construction methods that are compatible with existing historic resources could be chosen to reduce visual impacts to the SCD Historic District (HR-9). However, this mitigation could not reduce the impact to a less than significant level.

Alternative 1 (Dam Notching)

The impacts and mitigation measures described for CR-2 (Damage to Historic Structures from Construction-Related Vibration), CR-3 (Introduction of Temporary Dirt/Unintended Damage), CR-5 (Alteration to the Setting of Surrounding Environment),

and CR-6 (Introduction of Visual Obstructions) would be the same as the Proponent's Proposed Project.

Issue CR-1: Ground Disturbance

Disturbance to archaeological sites
Determination: ***less than significant with mitigation, long-term***

IMPACT

Impacts and mitigation measures for Cultural Resources Issue would be the same as the Proponent's Proposed Project, with the addition of the potential for impacts arising from the effects to previously undiscovered archaeological resources from sediment excavation in the river channel and disposal at Site 4R.

The sediment disposal site 4R should be considered moderately sensitive for the presence of archaeological resources. Due to heavy brush and poison oak coverage, the area could not be effectively surveyed during the field season.

MITIGATION

As described for the Proponent's Proposed Project, the Applicant will complete the Section 106 process, prepare a MOA, and conduct archaeological monitoring during clearing and grubbing of the site and during any subsurface excavation prior to disposal activities.

Issue CR-4: Demolition or Alteration to Historic Properties

Alterations to OCRD and associated fish ladder and to San Clemente Dam
Determination: ***significant, unavoidable, long-term***

IMPACT

The OCRD and Associated Fish Ladder (HR-4) would be altered, as described for Issue CR-4 under the Proponent's Proposed Project. Notching SCD would also alter the SCD and Associated Fish Ladder (HR-7). This would entail removing a portion of the existing spillway bay as well as the gates, piers and walkway at the top of the Dam. Those changes would result in a change to the Dam and associated fish ladder due to alteration of the property. This would be a significant and unavoidable long-term impact.

MITIGATION

Mitigation measures for long-term impacts would include recordation of the resources (OCRD and associated Fish Ladder (HR-4) and the SCD and associated Fish Ladder (HR-7)). Recordation would be completed prior to any construction, in the form of an HABS/HAER level documentation, which follows NPS regulations. Additional mitigation could include interpretive displays, development of an educational program on the Dam and associated facilities, and professional publications on the historic resources. All

mitigation would be outlined in a MOA and approved by SHPO. However, this mitigation would not reduce the impact to a less than significant level.

Alternative 2 (Dam Removal)

The impacts and mitigation measures described for Issues CR-1 (Ground Disturbance would be the same as Alternative 1. The impacts and mitigation measures described for CR-2 (Damage to Historic Structures from Construction-Related Vibration, CR-3 (Introduction of Temporary Dirt/Unintended Damage), CR-5 (Alteration to the Setting of Surround Environment), and CR-6 (Introduction of Visual Obstructions) would be the same as the Proponent's Proposed Project.

Issue CR-4: Demolition or Alteration to Historic Properties

Alterations to OCRD and associated fish ladder and to San Clemente Dam
Determination: ***significant, unavoidable, long-term***

IMPACT

The OCRD and Associated Fish Ladder (HR-4) could undergo alteration of property due to proposed improvements to access roads to SCD. Structural improvements would be made to the existing bridge that is placed on top of the embankment dam. Existing piers would be replaced with stronger and more deeply set piers, which could damage the OCRD. The SCD and Associated Fish Ladder (HR-7) would be demolished under this alternative. This would be a significant and unavoidable long-term impact.

MITIGATION

Mitigation measures for long-term impacts would include recordation of the resources (OCRD and associated Fish Ladder (HR-4) and the SCD and associated Fish Ladder (HR-7)). Recordation would be completed prior to any construction, in the form of an HABS/HAER level documentation, which follows NPS regulations. Additional mitigation could include interpretive displays, development of an educational program on the Dam and associated facilities, and professional publications on the historic resources. All mitigation would be outlined in a MOA and approved by SHPO. However, this mitigation would not reduce the impact to a less than significant level.

Alternative 3 (Carmel River Reroute and Dam Removal)

The impacts and mitigation measures for Issues CR-2 (Damage to Historic Structures from Construction-Related Vibration, CR-3 (Introduction of Temporary Dirt/Unintended Damage), CR-5 (Alteration to the Setting of Surround Environment), and CR-6 (Introduction of Visual Obstructions) would be the same as described for the Proponent's Proposed Project. The impacts and mitigation measures for Issue CR-4 (Demolition or Alteration to the Historic Properties) Obstructions would be the as same described for Alternative 2.

Issue CR-1: Ground Disturbance

Disturbance to archaeological sites
Determination: ***less than significant with mitigation, long-term***

IMPACT

Impacts and mitigation measures for Cultural Resources Issue would be the same as the Proponent's Proposed Project, except for the area described as the "saddle". Activities involving the "saddle" (the peninsula of land bordered to the east, north and west by the reservoir) could damage or destroy buried deposits in CA-MNT-1253 (BRM features) (AR-4), which has not been tested. A Testing Plan would need to be developed for this site prior to construction. Once the testing is completed, an NRHP determination of eligibility (DOE) would be completed. The outcome of the DOE will determine whether additional mitigation measures would be necessary.

MITIGATION

As described for the Proponent's Proposed Project, the Applicant will complete the Section 106 process, prepare a MOA, and conduct archaeological monitoring during clearing and grubbing of the site and during any subsurface excavation prior to disposal activities.

Mitigation measures for impact issue CR-1 would be the same as the Proponent's Proposed Project, except for the area described as the "saddle". Activities involving the "saddle" (the peninsula of land bordered to the east, north and west by the reservoir) could damage or destroy buried deposits in CA-MNT-1253 (BRM features) (AR-4), which has not been tested. If the site is eligible for the NRHP, avoidance would be the best form of mitigation. If avoidance is not possible, data recovery of the site could be required.

Alternative 4 (No Project)

None of the impact issues identified for the Proponent's Proposed Project and other action alternatives would apply to Alternative 4. No actions would occur that affect cultural resources in the Project Area.

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4.11 AESTHETICS

This section describes the visual quality effects of the Proponent's Proposed Project and its alternatives during construction and operations for the project site, maintenance areas and immediate surroundings. Additional information provided in this Final EIR/EIS clarifies and amplifies the information included in the Draft EIR/EIS. The visual analysis describes short- and long-term changes to the visual environment that would result from construction and operation of the Dam, reservoir, and associated infrastructure.

4.11.1 ENVIRONMENTAL SETTING

San Clemente Dam (SCD) and Vicinity

SCD is located in a steep-sided section of the Carmel River in the upper reaches of the Carmel River watershed. The existing reservoir created by the Dam occupies a portion of the Carmel River canyon and several side canyons formed by tributary streams. The north facing canyon slopes are covered with oaks while the south facing slopes are chaparral-covered. Presently, the most prominent visual features of the viewshed are the steep canyons and ridges, the existing SCD, and the reservoir that it forms. The reservoir is largely filled with sediment, which consists primarily of sandy gravel and sand. The finer-grained sediment is located nearest to the Dam in both arms of the reservoir (see Figure 4.11-1).

The SCD is a concrete arch dam that spans the canyon. the Dam is 106 feet high and 300 feet long. The reservoir surface elevation varies seasonally, revealing bare soil between the high water mark and water surface. the Dam is accessed by a gated, two-track dirt road. The road between the OCRB and the Dam traverses the canyon edges, with dense vegetation on either side of the road. A residence (former damkeeper's cottage) is located in close proximity to and northeast of the Dam.



***Figure 4.11-1**: Looking south towards reservoir from gated dam access road.
Photo credit: ENTRIX, Inc.*

Tularcitos Access Route / Concrete Batch Plant Site

The area is vegetated with a mix of deciduous trees, pines, and low-lying shrubs (see Figure 4.11-2). The vegetation is most dense around the Carmel River and Tularcitos Creek. Steep hills are located to the east and west of the proposed access road, with residences on the hills to the northeast and south of the route (see Figure 4.11-3). The hills are covered with trees, with some areas of low-lying shrubs. The 1.7-acre concrete batch plant site is an open grassy area populated with deciduous and evergreen trees and low-lying vegetation. Electrical wires on wood poles traverse the site. A CAW-owned residence is located immediately north of the CVFP along the Tularcitos Route. The road is paved adjacent to the CVFP site and in front of the residence.



***Figure 4.11-2**: Concrete Batch Plant Site, looking SE. Photo credit: ENTRIX, Inc.*



***Figure 4.11-3**: View of Concrete Batch Plant Site from Residences on Via Los Tulares, looking SW. Photo credit: ENTRIX, Inc.*

Cachagua Access Route

The area is remote, accessible only by a locked, gated dirt access road (Jeep Trail) off of Cachagua Road. The Jeep Trail leads to the conveyor route and descends in gradual switchbacks into the canyon. The Jeep Trail leads to a historic Stone Cabin (referred to HR-8 in Section 4.10, Cultural Resources), located at the south end of the reservoir on the west bank of the Carmel River. Sediment has encroached on portions of the Carmel River in the vicinity of the Stone Cabin (see Figures 4.11-4 and 4.11-5). The Stone Cabin is owned by a group of private landowners. The vegetation at the sediment disposal site is dense with a mix of deciduous and evergreen trees and low-lying shrubs and vegetation (see Figure 4.11-6). Some residences are located along Cachagua Road; however, the concrete batch plant site is not visible to the residences due to the distances of the residences from the site and the topography.



***Figure 4.11-4**: View of Carmel River by private landowner's cabin in the Project Area, looking NW. Photo credit: ENTRIX, Inc.*



***Figure 4.11-5**: View of sediment adjacent to Carmel River, looking NW.*
Photo credit: ENTRIX, Inc.



***Figure 4.11-6**: Jeep Trail off Cachagua Road, looking NW. Photo credit: ENTRIX, Inc.*

Conveyor Route / Sediment Disposal Site

The conveyor route is densely vegetated and located at the base of the steep canyon below the Jeep Trail (see Figure 4.11-7). The sediment disposal site is located adjacent to the Jeep Trail and is populated with a mix of well-spaced tall trees filled in with lower-lying vegetation (see Figure 4.11-8). Dense vegetation surrounds the sediment disposal site on all sides.



***Figure 4.11-7**: From the Jeep Trail looking NW to conveyor route. Photo credit: ENTRIX, Inc.*



***Figure 4.11-8**: Looking SE at sediment disposal site from Jeep Trail. Photo credit: ENTRIX, Inc.*

San Clemente Drive

Access to the Dam is via San Clemente Drive, which ends at a locked CAW gate. San Clemente Drive is a gated, paved road with large-lot residences on either side (see Figures 4.11-9, 4.11-10, and 4.11-11. The access route from the CAW gate to the Dam is a two-track dirt road. There is relatively dense vegetation on either side of the dirt access road. Existing access routes are through the residential community of Sleepy Hollow, which is located north of the Dam along San Clemente Drive. The houses in the community are positioned far from the street on large lots. Residences are also located along the southwest facing slopes of the canyon above and east of Carmel Valley Road. In general, many of the natural features and patterns are attractive and interesting, but they are not visually distinctive or unusual within the region.



***Figure 4.11-9**: House along San Clemente Drive in Sleepy Hollow Subdivision, looking SE*



***Figure 4.11-10**: View from Sleepy Hollow Subdivision looking toward the concrete batch plant location, looking NW. Photo credit: ENTRIX, Inc.*



***Figure 4.11-11**: View from the concrete batch plant location looking towards Sleepy Hollow Subdivision, looking SE. Photo credit: ENTRIX, Inc.*

2030 Baseline Conditions

Few to no changes are expected to the environmental setting through 2030.

4.11.3 ENVIRONMENTAL RESOURCE IMPACT STANDARDS AND METHODS

Standards of Significance

Under CEQA, a project would normally have a significant effect on the environment if it would:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings;

- Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area.

Impact Assessment Methodology

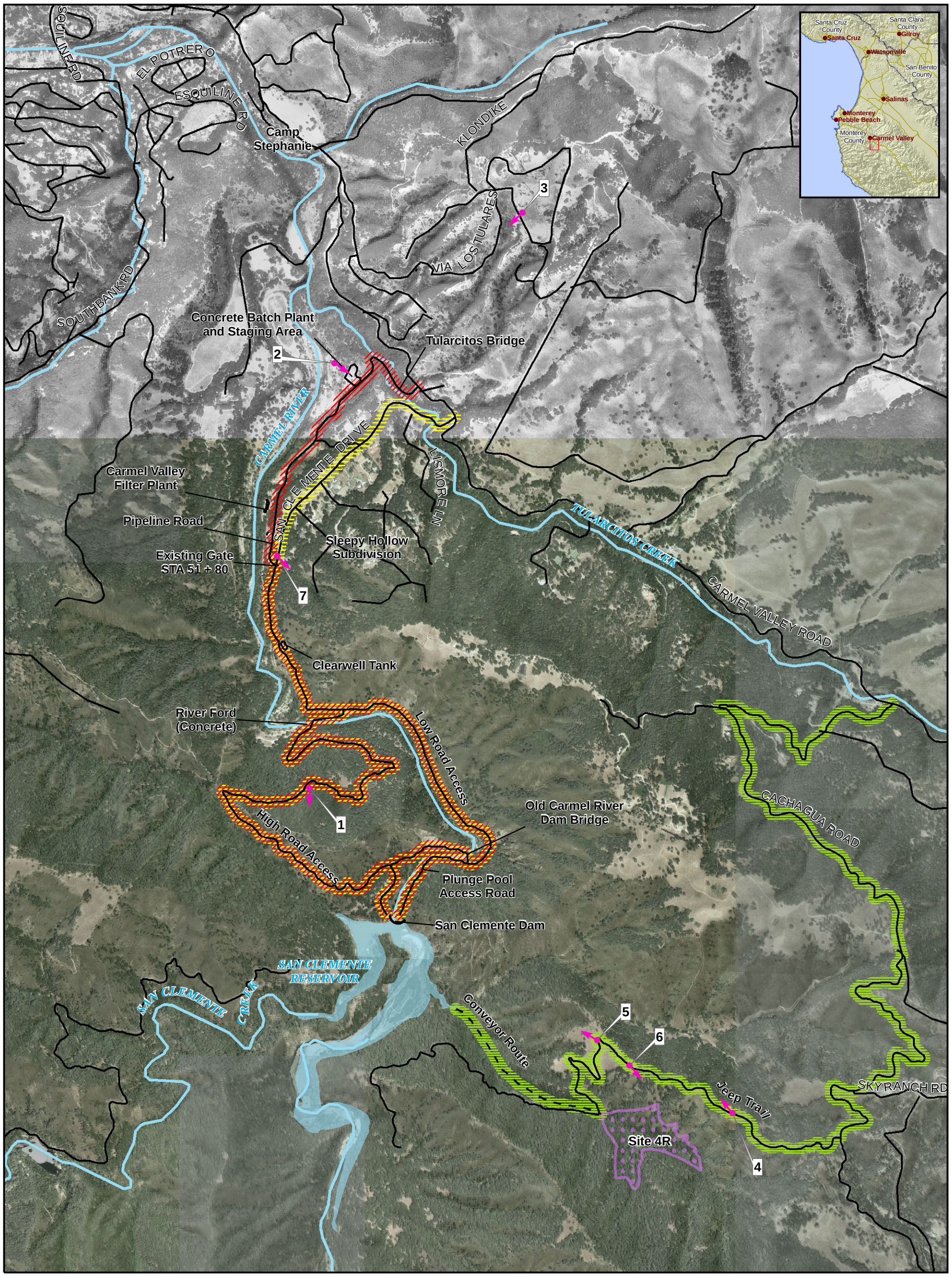
Access to the Project Area is currently available only to CAW staff and a group of private landowners of the Stone Cabin. Portions of the Project Area are either owned by the Monterey Peninsula Regional Park District (MPRPD) or conveyed under easement to the MPRPD (see Figure 4.11-12 for resource viewpoints). This land is currently closed to public access pending the development of a management plan. The plan would contain a public access plan of the MPRPD-owned land in the Project Area (pers. comm. Tim Jensen 2006). CAW will not restrict future public access to the riverfront on any Park-owned or privately-owned land in the Project Area. Since there is no current public access to the MPRPD-owned land in the Project Area, visual impacts were not assessed for park users and therefore photo simulations (pre- and post-project photographs) were not included with the visual assessment.

Effects on visual resources may be caused by the changes in the viewsheds to viewer user groups in proximity to the Project Area. The user groups identified with this project include: residents on the hills east and above Carmel Valley Road; residents in the houses in close proximity to the CVFP and SCD; residents in the Sleepy Hollow subdivision; and private landowners who have access to the historic Stone Cabin at the south end of the reservoir. The visual resources issues that are associated with changes to the Dam include:

- Residential views on hills east of Carmel Valley Road.
- Changes to the viewsheds from residences adjacent to the CVFP and the SCD.
- Changes to the viewsheds from residences in Sleepy Hollow subdivision.
- Changes to the Viewsheds from the Stone Cabin.
- Changes to the Viewshed from the Jeep Trail.

Photographs of key viewsheds in the Project Vicinity were taken to ascertain any changes in visual quality. The location and direction of these photographs is included in Figure 4.11-12. The photographs included in this section are numbered and correspond to the photo numbers on Figure 4.11-12. Viewer user groups not included in the visual analysis are the operations and management staff of CAW and public recreationists (due to no public access).

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Legend

Access Routes
- Cachugua / 4R
- Sleepy Hollow
- Tularcitos

- Stream
- Reservoir
- Existing Road
- Proposed Road

- Sediment Disposal Site
- Viewpoint/Direction

04/08/05
Projection: California State Plane, Zone IV
Datum: NAD 83 Units: Feet

San Clemente Dam EIS/EIR

Figure 4.11-12

Resources Viewpoints

0 0.15 0.3 0.6
Miles

N

D:\GIS\entrix\3018605\map\SC_VisViewpoints_17i11i_02.mxd 6/27/2007 9:36:51 AM Mukhtyar

ENTRIX planners conducted an additional visual resources field reconnaissance of the Sleepy Hollow subdivision on August 10, 2006. Visual impacts were assessed and photographs were taken from residential streets in the subdivision (see Figures 4.11-10 Figure 4.11-11). Planners did not have access to the interiors of Sleepy Hollow residences; therefore, no visual impacts were assessed from inside the residences.

ENTRIX planners also conducted a visual resources field reconnaissance to the Stone Cabin on August 10, 2006. They took photographs of the riverfront in the vicinity of the cabin, showing where sediment had encroached on portions of the river (see Figures 4.11-4 and 4.11-5).

4.11.3 IMPACTS AND MITIGATION

The following impact issues have been defined for visual quality:

- VQ-1: Residential Views on Hills East of Carmel Valley Road (operation of construction equipment within the viewshed)
- VQ-2: Changes to Viewsheds from Residences Adjacent to CVFP and SCD (construction activities within the viewshed)
- VQ-3: Residential Views from Sleepy Hollow (operation of construction equipment within the viewshed)
- VQ-4: Changes to Viewsheds from the Stone Cabin (construction activities within the viewshed of the Carmel River)
- VQ-5: Changes to Viewsheds from the Jeep Trail (construction activities within the viewshed)

Proponent's Proposed Project (Dam Thickening)

Issues VQ-4 and VQ-5 would not apply to the Proponent's Proposed Project.

Issue VQ-1: Residential Views on Hills East of Carmel Valley Road

Operation of construction equipment within the viewshed
Determination: ***less than significant, no mitigation required, short-term***

IMPACT

The viewsheds of the residences on the hills east of Carmel Valley Road (northeast and south of the proposed Tularcitos Access Route) would be disrupted during construction of the Tularcitos Access Route and subsequently by the use of heavy construction equipment at the concrete batch plant site during normal working hours. Short-term impacts would be less than significant because construction would occur at a long distance from the residences on the hills east of Carmel Valley Road and would occur during normal work hours. After construction, the viewshed would return to the condition

it was in prior to the construction. Normal CAW operations and maintenance activities would occur following construction. Therefore, no long-term impacts are anticipated.

MITIGATION

Because the activities associated with the disruption of the viewsheds would be short-term and would only occur during regular working hours, no short-term mitigation measures would be necessary. Use of the access road after construction would be intermittent; therefore, no long-term mitigation measures would be necessary.

Issue VQ-2: Changes to the Viewsheds from Residences Adjacent to the CVFP and the San Clemente Dam

Construction activities within the viewshed
*Determination**: less than significant, no mitigation required, short-term***

IMPACT

The residences located adjacent to the CVFP and the Dam would have views of the construction activities during normal working hours. Short-term impacts would be less than significant because construction would occur during normal work hours. Due to the location of these residences, dam operations and maintenance activities are routine features of the landscape.

Normal operations and maintenance activities would occur following construction. After construction, the viewshed would return to the condition it was prior to the construction. Therefore, no long-term impacts are anticipated.

MITIGATION

Because the activities associated with the disruption of the viewsheds are short-term and would only occur during regular working hours, no short-term mitigation measures are necessary. Use of the access road after construction would be for normal dam operations and maintenance activities; therefore, no long-term mitigation measures are necessary.

Issue VQ-3: Residential Views from Sleepy Hollow

Operation of construction equipment and ancillary facilities within the viewshed
*Determination **significant, unavoidable, short-term***

IMPACT

The concrete batch plant location is not visible from the residential streets in the subdivision, due to the topography and dense vegetation (e.g., tall trees). Residents have stated that it would be visible from two residences in the subdivision, but field reconnaissance did not confirm this.[1] The concrete batch plant would be a temporary

[1] Field surveyors did not have access to residences to view the batch plant site from upper stories. Judging visibility from the street level and considering screening vegetation, the site would not be visible.

structure that will be removed within one year of its construction. The distance of the concrete batch plant from the Sleepy Hollow Subdivision is approximately 2,500 feet. This distance, coupled with obstructions from vegetation, would lessen the concrete batch plant visual impacts to Sleepy Hollow. Visual impacts would be short-term and construction-related and no long-term visual effects would occur as a result of the batch plant to Sleepy Hollow homeowners. Although the batch plant would be some distance from the two residences and the impact would be short-term, it is difficult to say with certainty that the impacts would be less than significant.

MITIGATION

The batch plant requires a level area approximately five acres (about 218,000 square feet) in size with good road access in order to move in/out the larger pieces of batch plant equipment and aggregate materials. This limits possible sites for the batch plant to generally near Carmel Valley Road, and not up the canyon closer to the Dam due to mountainous terrain and narrow, winding access roads. There is a smaller site closer to the Dam, but it would not be large enough for large trucks to turn around; therefore, it would not be not technically feasible to locate the batch plant closer to the Dam. In addition, the proximity of electric power lines may avoid the use of diesel generators for batch plant operation, thus avoiding emissions of NO_X, CO, ROC, SO_2 , and diesel fine particulate (PM_{10}).

There are no mitigation measures available. The batch plant would be removed after one year.

Alternative 1 (Dam Notching)

Visual Quality Issue VQ-1 (Residential Views on Hills East of Carmel Valley Road) does not apply to Alternative 1 (Tularcitos access is developed only for the Proponent's Proposed Project and the concrete batch plant applies only to the Proponent's Proposed Project). Impacts and mitigation measures for VQ-2 (Changes to Viewsheds from Residences Adjacent to CVFP and SCD) would be the same as the Proponent's Proposed Project.

Issue VQ-3: Residential Views from Sleepy Hollow

Operation of construction equipment and ancillary facilities within the viewshed
Determination: ***less than significant, no mitigation required, short-term***

IMPACT

The residences in the Sleepy Hollow Subdivision would have disrupted viewsheds during regular hours of construction from the heavy equipment using San Clemente Drive to get to the Dam access road. This would be a short-term impact. This alternative does not include the construction or operation of a batch plant. Normal operations and maintenance activities would occur following construction; therefore, no long-term impacts are anticipated. Under CEQA, this would be a less than significant impact.

MITIGATION

Because the activities associated with the disruption of the viewsheds would be temporary and would only occur during regular working hours, no short-term mitigation measures would be necessary. Use of the access road after construction would be intermittent and would include normal operations and maintenance activities; therefore, no long-term mitigation measures would be necessary.

Impact VQ-4: Changes to Viewsheds from the Stone Cabin

Construction activities within the viewshed of the Carmel River
Determination: ***less than significant, short-term; beneficial, long-term***

IMPACT

During construction, it is possible that restoration of the creek may lead to removal of sediment in the area near Stone Cabin. Construction would occur during daytime working hours. Construction vehicles would be removed from the Jeep Trail in the vicinity of the Stone Cabin during nonworking hours. Part or all of the Carmel River/San Clemente Creek in the reaches viewed by the Stone Cabin would be restored as a free-flowing stream, which would have a beneficial aesthetic effect in the long-term.

MITIGATION

Because the activities associated with the changes to the viewsheds would be short-term occurring only during the restoration construction and create a beneficial effect in the long-term, no mitigation measures would be required.

Impact VQ-5: Changes to Viewsheds from the Jeep Trail

Construction activities within the viewshed using the sediment disposal site
Determination: ***significant and unavoidable impact, short-term; less than significant with mitigation, long-term***

IMPACT

During construction, private landowners of the Stone Cabin would have views of the sediment disposal site adjacent to the Jeep Trail and the sediment conveyor overcrossing, which would be above the Jeep Trail. A relatively small segment of the sediment disposal site would be visible to the landowners traveling on the Jeep Trail for a short duration of travel time. The sediment conveyor overcrossing together with the sediment pile would substantially degrade the existing visual character or quality of the site and its surroundings during construction. This would be a short-term impact. Under CEQA, this would be a significant and unavoidable impact. After construction, the sediment disposal site would be vegetated, causing it to blend with the surroundings, and the sediment conveyor overcrossing would be removed. The access roads would be improved, but would still be dirt roads. Therefore, there would be no visual impact as a result of the road improvements. This would be a less than significant, long-term impact.

MITIGATION

Mitigation measures for short-term impacts would include screening the portion of the sediment disposal site adjacent to the Jeep Trail with vegetation during construction. Mitigation measures for long-term visual impacts would include vegetation of the sediment disposal site and the removal of the sediment conveyor overcrossing.

Alternative 2 (Dam Removal)

Visual Quality Issue VQ-1 (Residential Views on Hills East of Carmel Valley Road) would not apply, as Alternative 2 would have no impact on residential views on hills east of Carmel Valley Road. Impacts and mitigation for Issue VQ-2 (Changes to Viewsheds from Residences Adjacent to CVFP and SCD) would be the same as the Proponent's Proposed Project. Impacts and mitigation for Issues VQ-3 (Residential Views from Sleepy Hollow), VQ-4 (Changes to viewsheds from the Stone Cabin) and VQ-5 (Changes to viewsheds from the Jeep Trail) would be the same as Alternative 1.

Alternative 3 (Carmel River Reroute and Dam Removal)

Impacts and mitigation for Visual Quality Issue VQ-1 (Residential Views on Hills East of Carmel Valley Road) would not apply as Alternative 3 would have no impact on residential views on hills east of Carmel Valley Road. Impacts and mitigation for Issue VQ-2 (Changes to Viewsheds from Residences Adjacent to CVFP and SCD would be the same as the Proponent's Proposed Project. Mitigation for impacts resulting from Issue VQ-3 (Residential Views from Sleepy Hollow) would be the same as Alternative 2. The impacts and mitigation for Issue VQ-4 (Changes to viewsheds from the Stone Cabin) would be the same as Alternative 1. Issue VQ-5 (Changes to viewsheds from the Jeep Trail) would not apply as there would be no sediment disposal site adjacent to the Jeep Trail.

Alternative 4 (No Project)

The viewsheds from the residences east of Carmel Valley Road, the Sleepy Hollow Subdivision, those adjacent to the CVFP and the Dam, and the private landowners of the Stone Cabin would not be disrupted because large construction activities would not occur. Normal operations and maintenance activities would continue to occur. Therefore, there would be no visual impacts or mitigation required.

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4.12 RECREATION

The Draft EIR/EIS addressed recreation in a general chapter on "other environmental effects." In response to comments, the Recreation section has been created in this Final EIR/EIS to address potential recreation effects in more detail. This section describes the recreation effects of the Proponent's Proposed Project and its alternatives during construction and operations for the project site, maintenance areas and immediate surroundings. The recreation analysis describes short and long-term changes to the recreational facilities that would result from construction and operation of the Dam, reservoir, and associated infrastructure.

4.12.1 ENVIRONMENTAL SETTING

Recreational use of the Project Area is currently limited to access by a group of private landowners who own a remote Stone Cabin at the south end of the reservoir, on the west bank of the Carmel River (see Figure 4.12-1).



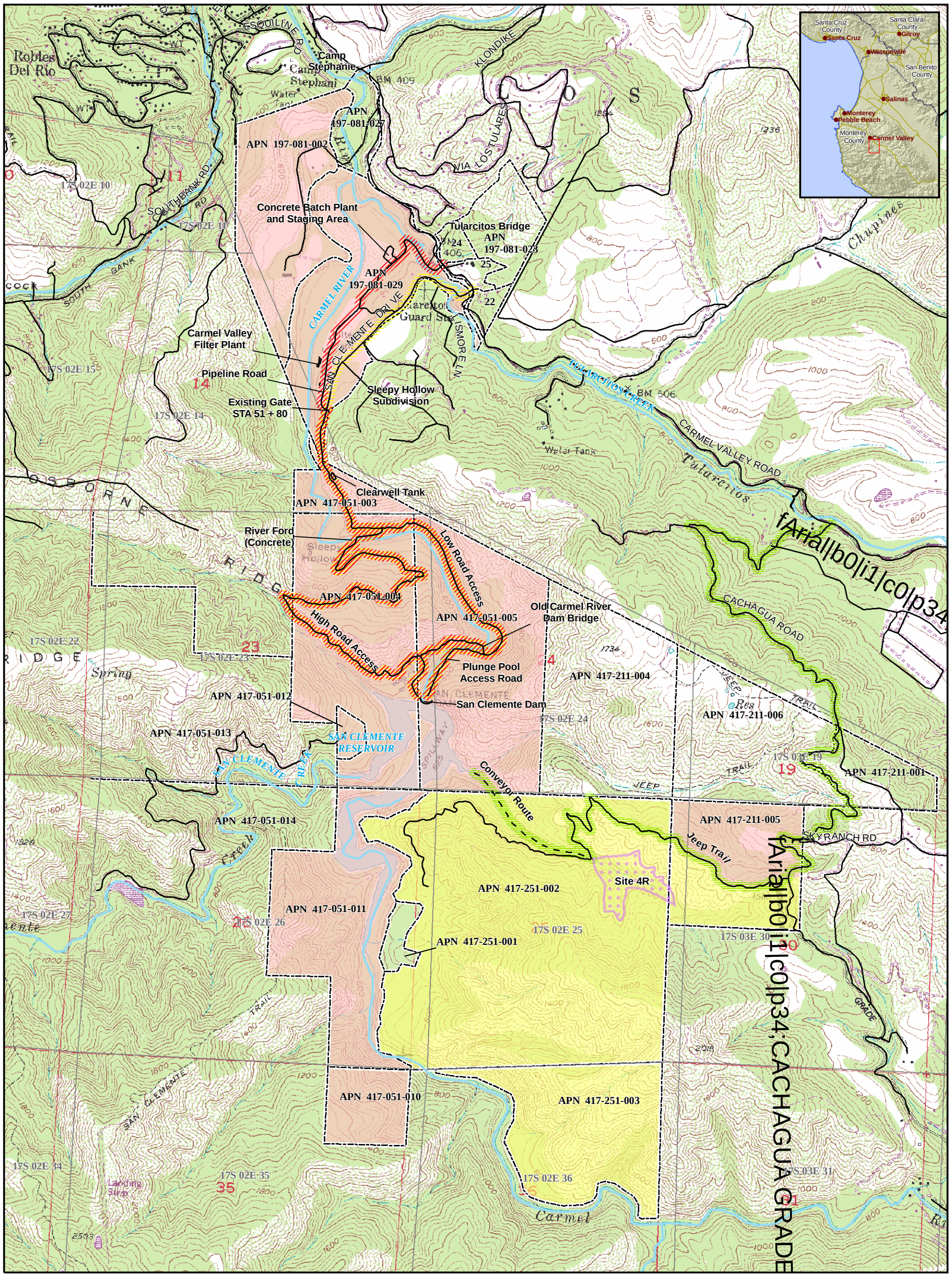
Figure 4.12-1*: Looking south towards Stone Cabin from Jeep Trail Access Road. Photo credit: ENTRIX, Inc.*

The historic Stone Cabin is referred to as HR-8 in section 4.10, Cultural Resources, of Chapter 4 and its location is marked in Figure 4.10-2 (Inventoried Historic Resources Map). Access to the cabin is via the Jeep Trail (i.e., 4WD road) and through a locked gate from Cachagua Road. The Carmel River channel is a short walking distance from the Stone Cabin (see Figure 4.12-2).



Figure 4.12-2*: Looking east towards Carmel River channel in vicinity of Stone Cabin*
Photo credit: ENTRIX, Inc.

Portions of the Project Area are owned by the MPRPD or conveyed under easement by the owners of the Stone Cabin to the MPRPD (letter dated June 27, 2006 from Larry Horan). The location of the MPRPD-owned land is shown in Figure 4.12-3, Land Ownership. Garland Ranch Regional Park, which is owned by the MPRPD, is located immediately east of the Project Area. There is currently no public access to the MPRPD-owned land in the Project Vicinity. However, the MPRPD's ten-year planning horizon includes developing a management plan for the Project Area, which would include a public access plan (pers. comm. T. Jensen 08/04/06 and 08/10/07).



Legend

Access Routes
- Cachugua / 4R
- Sleepy Hollow
- Tularcitos

- Stream
- Existing Road
- Proposed Road
- Sediment Disposal Site
- Public Land Survey Section

- General Location of Property Boundaries

Land Owner
- CAW
- Monterey Peninsula Regional Park District

Projection: California State Plane, Zone IV
Datum: NAD 83 Units: Feet

San Clemente Dam EIS/EIR

Figure 4.12-3

Land Use

0 0.15 0.3 0.6

Miles

N

2030 Baseline

The MPRPD intends to complete a management plan for the park district-owned land in the Project Area within the next ten years. Stewardship of the land and public access would be included in the management plan. The MPRPD intends to provide public access for passive recreational use (e.g., mountain biking, hiking, etc.) in the MPRPD-owned lands in the Project Area. Eventually, the MPRPD would like to provide a connection, or greenbelt, between the public park land on adjacent properties (in the vicinity of the Los Padres Dam) with the park land in the Project Area through easements or other avenues on privately-owned and CAW-owned land (pers. Comm. T. Jensen 08/17/06 and 08/10/07).

4.12.2 ENVIRONMENTAL RESOURCE IMPACT STANDARDS AND METHODS

Standards of Significance

Under CEQA, a project would normally have a significant effect on the environment if it will:

- Conflict with established recreational, educational, religious or scientific uses of the area.

Impact Assessment Methodology

The recreational user groups identified with this project include private landowners with access to the Stone Cabin at the south end of the reservoir. Access for this recreational user group is through a locked gate off Cachagua Road via the Jeep Trail. The MPRPD land in the Project Area is currently not accessible to the public; therefore, public park users were not included in the recreational user groups for this analysis. Impacts associated with access to the Carmel River for recreational purposes were not included because there is no public access to the river through the Project Area. The recreational issues that are associated with changes to the Dam include:

- Access to the Stone Cabin via the Jeep Trail (Alternatives 1 and 3)
- Deposition of sediment in Site 4R (Alternatives 1 and 2)
- Use of the Jeep Trail for construction purposes (Alternatives 1, 2, and 3)
- Rerouting and/or restoring the Carmel River channel (Alternatives 1, 2, and 3)

4.12.3 IMPACTS AND MITIGATION

The following impact issues have been defined for recreation:

- REC-1: Access to the Stone Cabin via the Jeep Trail (blocked by sediment disposal at Site 4R)
- REC-2: Disruption of Use of Jeep Trail to Stone Cabin (heavy equipment traversing Jeep Trail)
- REC-3: Rerouting or Restoring the Carmel River Channel (restore to the river to its original free-flowing state)
- REC-4: Deposition of Sediment on Site 4R (sediment disposal on parkland)

Proponent's Proposed Project (Dam Thickening)

Issues REC-1, REC-2, REC-3, and REC-4 would not apply to the Proponent's Proposed Project. Therefore, there would be no recreational impacts or mitigation measures required for the Proponent's Proposed Project.

Alternative 1 (Dam Notching)

Issue REC-1: Access to the Stone Cabin via the Jeep Trail

Sediment pile blocked access via the Jeep Trail under the design for Site 4R proposed in the Draft EIR/EIS
Determination: ***less than significant, no mitigation required, short-term***

IMPACT

Issue REC-1 was raised in the comments to the Public Draft EIR/EIS. Under the design in the Public Draft EIR/EIS, access to the Stone Cabin would have been blocked by use of the sediment disposal site (Site 4R). For the Final EIR/EIS, this alternative has been redesigned to relocate the sediment disposal site so that access the Stone Cabin would not be blocked. See Section 3.3 for more discussion on the access road and the sediment disposal site.

MITIGATION

The revised design for Site 4R avoids the impact. No mitigation is required.

Issue REC-2: Disruption of Use of Jeep Trail to Stone Cabin

Heavy equipment traversing Jeep Trail
Determination: ***significant, unavoidable, short-term***

IMPACT

During construction season (all year round of CY 3 and March – October in following seasons), there would be daily worker access via the Jeep Trail. Heavy earth moving and other construction equipment would occur at the beginning and end of each construction season for three seasons, averaging 2-3 loads per day for the first and last month of each construction season. This would be a short-term impact that is significant and unavoidable. No long term impacts are anticipated.

MITIGATION

Operation of heavy earth moving and other construction equipment would occur during normal working hours. Refer to Sections 4.7.3, 4.8.3, and 4.9.3 for a discussion of mitigation to air quality, noise, and traffic effects.

Issue REC-3: Rerouting or Restoring the Carmel River Channel

Restore the river to its original free-flowing state
Determination: ***beneficial impact, no mitigation required, long-term***

IMPACT

The river channel would be restored to a geomorphically stable condition (to its original free-flowing state in the reach from which sediment excavated). Therefore, this would provide a beneficial aesthetic and recreational effect.

MITIGATION

No mitigation measures are required because restoration of the river channel would create a beneficial impact.

Issue REC-4: Deposition of Sediment on Site 4R

Sediment disposal on parkland
Determination: ***significant, unavoidable, short term; less than significant with mitigation, long-term***

IMPACT

Approximately 1.5 million cubic yards of accumulated sediment would be removed over two seasons from the Carmel River channel by excavation with heavy equipment and deposited on Site 4R, which occupies land currently owned by or conveyed under easement to the MPRPD. This would occur over two seasons. Impacts include adding sediment to open space parkland. Impacts would be significant and unavoidable. Long-term effects on recreation would be reduced to a less than significant level with implementation of mitigation.

MITIGATION

Following construction, the sediment disposal site located on MPRPD-owned land would be fully restored to close to its pre-project state, including restoring the site with riparian habitat. The site would return to use as open space parkland.

Alternative 2 (Dam Removal)

The impacts and mitigation for Recreational Issues REC-1 (Access to the Stone Cabin via the Jeep Trail), REC-2 (Disruption of use of Jeep Trail to Stone Cabin), REC-3 (Rerouting or restoring the Carmel River channel), and REC-4 (Deposition of Sediment in Site 4R) would be the same as described for Alternative 1.

Alternative 3 (Carmel River Reroute and Dam Removal)

Recreational Issue REC-1 (Access to the Stone Cabin via the Jeep Trail) does not apply, as Site 4R would not be used under Alternative 3. The impacts and mitigation for REC-2 (Disruption of use of Jeep Trail to Stone Cabin) would be the same as described for Alternative 1. REC-3 (Rerouting or restoring the Carmel River channel) would be the same as described for Alternative 1, but the beneficial effect would extend through a longer reach, including the diversion bypass and restored San Clemente Creek channel around the Carmel River. REC-4 (Deposition of Sediment in Site 4R) would not apply, as there would be no sediment disposal at Site 4R.

Alternative 4 (No Project)

No construction is planned Alternative 4. Therefore, Impact Issues REC-1, REC-2, REC-3, and REC-4 would not apply. No recreational impacts or mitigation measures would be required for Alternative 4.

4.13 LAND USE

The Draft EIR/EIS addressed land use in a general chapter on "other environmental effects." In response to comments made during the public review, this new section was developed for this Final EIR/EIS to address land use in more detail. This section describes the land use effects of the Proponent's Proposed Project and its alternatives during construction and operations for the project site, maintenance areas and immediate surroundings. The land use analysis describes short and long-term changes to the land uses that would result from construction and operation of the Dam, reservoir, and associated infrastructure.

4.13.1 ENVIRONMENTAL SETTING

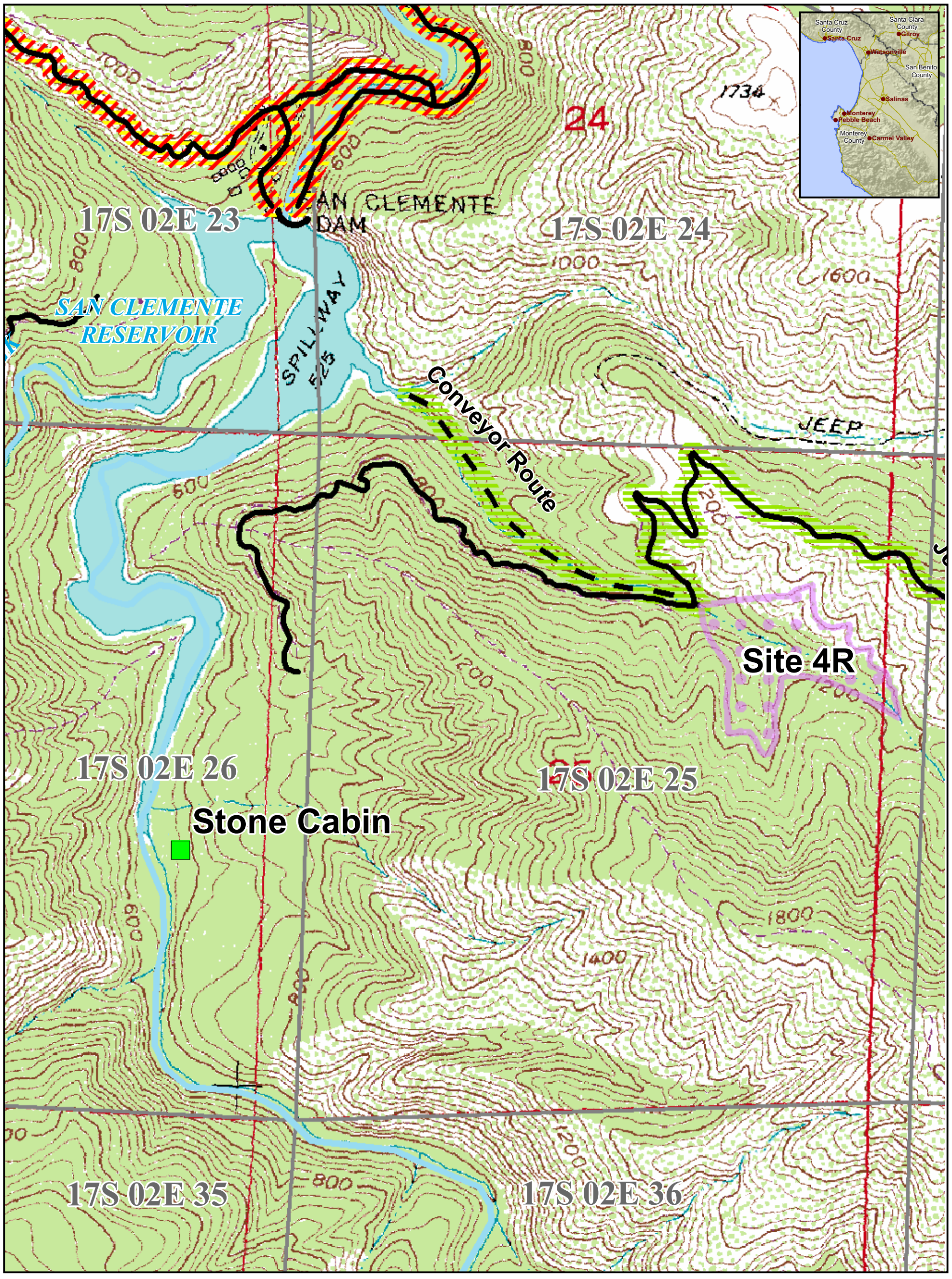
Land use in the Project Area consists of dam-related facilities (including two dams (SCD and OCRD); a filtration plant; two chemical buildings; two residences; and access roads); a privately-owned recreational site (Stone Cabin at the south end of the reservoir, on the west bank of the Carmel River); and park land, owned by or conveyed under easement to the MPRPD (see Figure 4.13-1). The Sleepy Hollow subdivision (residential community) is located on the east side of San Clemente Drive. Sediment Disposal Site 4R is currently owned by the MPRPD. At present, the park district has no plans or policies that would prevent use of Site 4R. Public access is currently closed to the Park-owned land in the Project Area. The park district, however, intends to create a management plan for all the MPRPD-owned land in the Project Area. The management plan would address land use of site 4R as well as stewardship of the land and access to the area (pers. comm. Tim Jensen 08/17/06).

The Dam-related facilities are owned by CAW. The Stone Cabin, listed as HR-8 in the San Clemente Dam Seismic Safety Project EIR/EIS Cultural Resources Section 4.10, is owned by a group of 10 individuals, all of whom have access to the gated Project Area. Public access is currently closed to all park district-owned land in the Project Area. See Figure 4.13-1 for a map of land ownership in the Project Area, and Figure 4.13-2 for a map showing the relationship of the Stone Cabin to project features. There is no prime agricultural land in the Project Area.

Adjacent land uses include the Garland Ranch Regional Park (northwest of Project Area); Carmel Valley Village (northwest of Project Area); Tularcitos Ridge residential subdivision (east of and on a ridge above the project); and Cachagua Community Park (southeast of Project Area).

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Camp Stephanie
Concrete Batch Plant and Staging Area
Carmel Valley Filter Plant
Pipeline Road
Existing Gate STA 51 + 80
Sleepy Hollow Subdivision
Clearwell Tank
APN 417-051-003
River Ford (Concrete)
APN 417-051-004
APN 417-051-005
Low Road Access
High Road Access
Old Carmel River Dam Bridge
Plunge Pool Access Road
San Clemente Dam
APN 417-051-012
APN 417-051-013
SAN CLEMENTE RESERVOIR
APN 417-051-014
APN 417-051-011
APN 417-251-001
APN 417-251-002
APN 417-251-003
APN 417-051-010
APN 417-211-004
APN 417-211-006
APN 417-211-001
APN 417-211-005
Site 4R
Conveyor Route
Jeep Trail
APN 197-081-027
APN 197-081-002
APN 197-081-029
Tularcitos Bridge
APN 197-081-023
Guard Sta
Santa Cruz County
Santa Clara County
Gilroy
Santa Cruz
Watsonville
San Benito County
Salinas
Monterey
Pebble Beach
Monterey County
Carmel Valley
ESQUILINE RD
KLONDIKE
VIA LOS TULARES
SOUTH BANK RD
SOUTH BANK
SAN CLEMENTE DRIVE
LUCIA LEE
LUCIA MORE LN
CARMEL VALLEY ROAD
CACHAGUA ROAD
SKY RANCH RD
OSBORNE RIDGE
SAN CLEMENTE CREEK
Tularcitos Creek
Carmel River
17S 02E 10
17S 02E 11
17S 02E 14
17S 02E 15
17S 02E 22
17S 02E 23
17S 02E 24
17S 02E 25
17S 02E 26
17S 02E 27
17S 02E 34
17S 02E 35
17S 02E 36
17S 03E 19
17S 03E 30
17S 03E 31
Legend
Access Routes
Cachugua / 4R
Sleepy Hollow
Tularcitos
Stream
Existing Road
Proposed Road
Sediment Disposal Site
Public Land Survey Section
General Location of Property Boundaries
Land Owner
CAW
Monterey Peninsula Regional Park District
Project Datum: CalNAD 83 State Plane Zone IV
San Clemente Dam EIS/EIR
Figure 4.13-1
Land Ownership
N
Miles
fArial|b0|i1|c0|p34;CACHAGUA GRADE



Legend

Access Routes

- Cachugua / 4R
- Sleepy Hollow
- Tularcitos
- Stream
- Existing Road
- Proposed Road
- Sediment Disposal Site
- Public Land Survey Section

Projection: California State Plane, Zone IV
Datum: NAD 83 Units: Feet

San Clemente Dam EIS/EIR

Figure 4.13-2

Stone Cabin Project Features

0 0.05 0.1 0.2

Miles

N

2030 Baseline

The park district intends to complete a management plan for MPRPD-owned land in the Project Area. The park district anticipates providing public access for passive recreational use on their lands in the Project Area (e.g., mountain biking, hiking, etc.). Eventually, the park district would like to provide a connection between the public park land on adjacent properties with the park land in the Project Area through easements or other avenues on CAW-owned land (pers. Comm. T. Jensen 08/17/06).

4.13.2 ENVIRONMENTAL RESOURCE IMPACT STANDARDS AND METHODS

Standards of Significance

Under CEQA, a project would normally have a significant effect on the environment if it will:

- Conflict with adopted environmental plans and goals of the community where it is located; and
- Convert prime agricultural land to non-agricultural use or impair the agricultural productivity of prime agricultural land.

Impact Assessment Methodology

Land uses were identified during a field reconnaissance to the Project Area. Land ownership data was obtained from CAW and the MPRPD. The land use issue that is associated with changes to the Dam includes:

- Compatibility of proposed land use changes with existing plans and policies

A Fire Prevention and Suppression Plan (Appendix Z) was created to identify measures to be taken by CAW and its contractors to ensure that fire prevention and suppression techniques are carried out in accordance with federal, state, and local regulations.

4.13.3 IMPACTS AND MITIGATION

The following impact issue has been defined for land use:

- LU-1: Conflict with Existing Plans and Policies in the Project Area (construction and operations changing the existing land use)

Proponent's Proposed Project (Dam Thickening)

Issue LU-1: Conflict with existing plans and policies

Construction and operations changing the existing land use
Determination: ***less than significant with mitigation, long term***

IMPACT

Construction and operation impacts would include grading, construction of a new access route from Carmel Valley Road (encroachment on county right-of-way); changes to land use (creation of new road and temporary batch plant); and tree removal.

MITIGATION

The Applicant would obtain the following permits from the Monterey County Planning and Building Inspection Department (MCPBID) for the proposed land use changes: Tree Removal Permit, Encroachment Permit; Use Permit; and Grading Permit. The MCPBID would provide a complete list of required permits when a project description and map are submitted as part of a pre-application appointment. Although land use would be changed at the batch plant site during construction, MCPBID permits would be obtained and permit conditions met. Therefore, long-term impacts would be less than significant. The land use at the batch plant site would be restored to close to pre-project conditions following construction.

The draft updated Monterey County General Plan includes a safety element (S-4.13) which states "The county shall require all new development to have adequate water available for fire suppression. The water system shall comply with Monterey County Code Chapter 18.56, National Fire Protection Association (NFPA) Standard 1142, or other nationally recognized standard. The fire authority having jurisdiction and the MCPBID, and all other regulatory agencies shall determine the adequacy and location of water supply and/or storage to be provided." A fire suppression plan (Appendix Z) has been created to respond to this anticipated requirement.

Alternative 1 (Dam Notching)

Issue LU-1: Conflict with existing plans and policies

Construction and operations changing the existing land use
Determination: ***significant and unavoidable, short-term; less than significant with mitigation, long term***

IMPACT

Construction and operation impacts would include grading; changes to land use (sediment disposal on MPRPD-owned land); and tree removal.

The sediment disposal plan proposed in the Public Draft EIR/EIS would have blocked the Jeep Trail and restricted access to the Stone Cabin during construction. The revised plan proposed in this Final EIR/EIS is to relocate the site uphill and provide a conveyor overcrossing to allow access along the Jeep Trail to the Stone Cabin.

MITIGATION

The following permits from MCPBID would allow for the proposed land use changes: Tree Removal Permit, Encroachment Permit; Use Permit; and Grading Permit. The Monterey County Planning Department would provide a complete list of required

permits when a project description and map are submitted as part of a pre-application appointment. Once these permits have been obtained and permit conditions met, the long-term impacts would be less than significant. The MPRPD board would review proposed mitigation regarding restoration of Site 4R and improvement to the Jeep Trail following construction activities. Short-term impacts to park district-owned land would be significant and unavoidable because land use would change from an open park to a sediment disposal site during construction. Long-term impacts to park district-owned land would be less than significant with mitigation because Site 4R would be restored to a condition similar to pre-project (riparian habitat) and, at the discretion of MPRPD, the Jeep Trail would be improved for parkland access. Section 4.5 Wildlife and Vegetation discussed riparian habitat in greater detail.

Alternative 2 (Dam Removal)

Land Use Issue LU-1 (Conflict with Existing Plans and Policies) would be the same as described for Alternative 1.

Alternative 3 (Carmel River Reroute and Dam Removal)

There would be no changes to land use under this alternative; Issue LU-1 (Conflict with Existing Plans and Policies) would not apply.

Alternative 4 (No Project)

Normal operations and maintenance activities would continue to occur. Therefore, there would be no land use impacts or mitigation measures required.

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4.14 ENVIRONMENTAL JUSTICE

This section describes environmental justice concepts and issues under NEPA related to federal actions in the Project Area. Under NEPA, social and economic impacts must be considered in an EIS (40 CFR 1508.8 [b]). Environmental Justice issues are of general interest to CEQA procedures but are not a central part of them. CEQA is primarily concerned with traditional physical environmental impacts. CEQA compliance generally does not require lead agencies to consider the purely economic or social effects of proposed projects, unless they relate to a physical change in the environment (CEQA Guidelines Section 15131).

In 1994, the President of the United States issued Executive Order (EO) 12898. "*Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*." The objectives of EO 12898 include identification of disproportionately high and adverse health and environmental effects on minority populations and low-income populations that could be caused by a proposed federal action. Accompanying EO 12898 was a Presidential Transmittal Memorandum that referenced existing federal statutes and regulations, including NEPA, to be used in conjunction with the EO. The Council on Environmental Quality (CEQ) issued *Guidance Under NEPA* in December 1997 (CEQ 1997).

Following the lead of EO 12898, California passed a series of environmental justice measures in 2001. These laws define environmental justice as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations and policies." (California Government Code, Section 65040.12(e). Although federal and state environmental justice approaches differ somewhat, the underlying intention of both approaches is the fair and equal treatment of all races, cultures and incomes.

Consideration of environmental justice in NEPA documentation ensures that two questions are asked: (1) is a federal project with significant, adverse environmental impacts being proposed in a community comprised largely of minority or low-income persons, and (2) would any significant, adverse human health or environmental effects of the project disproportionately affect minority or low-income persons.

The federal government provides an official definition of poverty, but there is no officially accepted definition of low-income. Some definitions of "low-income" use the federally defined "poverty" level and another less strict definition based on households earning up to 50 percent more income than allowed under poverty definition (Table 4.14-1). Both definitions have the advantage of readily available data published by the U.S. Census Bureau.

Table 4.14-1: Low-Income Definitions

Household Size	Poverty Level (a)	150% Poverty Level
1 person	$8,500	$12,750
2 persons	$10,800	$16,200
3 persons	$13,290	$19,950
4 persons	$17,000	$25,500
5 persons	$20,000	$30,150

(a) Poverty level defined by federal government.

The United States Department of Housing and Urban Development (HUD) defines low-income by comparing annual income for various sized households to an area's median income. For California, the three-year average median household income for the years 2001-2003 is $48,979 (HUD 2005). HUD issues income guidelines for extremely low-income households (those with 30 percent or less of an area's median income), very low-income households (those with 50 percent or less of the area median income), and low-income households (those with 80 percent or less of the area median income). For California, a household income of $39,183 is defined as "low-income" (Table 4.14-2).

Table 4.14-2: Three-Year-Average Median Household Income in California: 2001-2003

Median Income	30% Median	50% Median	80% Median
$48,979	$14,694	$24,490	$39,183

Source: U.S. Department of Housing and Urban Development and U.S Census Bureau, 5/13/2005

Low-income population refers to any readily identifiable group of low-income persons who live in geographic proximity and, if circumstances warrant, geographically dispersed/ transient persons (such as migrant workers or Native Americans) who would be similarly affected by the Proponent's Proposed Project or alternatives.

The federal government considers a minority population to be present if the minority population percentage of the affected area is greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (census tracts are generally considered appropriate).

The meaning of *"Disproportionately High and Adverse Effect on Minority and Low-Income Populations"* is that an adverse effect is predominantly borne by a minority population and/or a low-income population, and that the effect will be suffered by the minority population and/or low-income population at an appreciably more severe or greater magnitude than the adverse effect that will be suffered by the rest of the population.

For the Proponent's Proposed Project and alternatives, an analysis is provided to determine whether any of the adverse effects associated with the federal actions would disproportionately affect low-income or minority populations.

4.14.1 ENVIRONMENTAL SETTING

Racial and income data from the 2000 U.S. Census (2005) and income guidelines from HUD and the federal designation of the "poverty level" provides the basis to determine low-income and racial minority populations. The location of minority and low-income populations potentially affected by the Proponent's Proposed Project was identified through review of census data for the Project Area including lands surrounding the project site. Census Tract 110 covers the area, which includes the communities of the Sleepy Hollow subdivision and Carmel Valley Village, and the geographic region containing San Clemente Creek and River, Tularcitos Creek, and major Project Area access roads, including Cachagua Road. Census Tract 110 represents the environmental justice study area (EJSA). This census tract provides the best available demographic information for the project site and the surrounding area.

Affected Environment-Low-Income Population

The 2000 Census (2005) reports median household incomes for Monterey County of $48,305. Median household income for the census tract (Census Tract 110) in the EJSA is $70,313; with about 64 percent of the households (1,673) in the census tract having incomes exceeding $50,000 and approximately 46 percent of households (1,194) with average earnings of over $75,000 (Table 4.14-3).

Table 4.14-3: Household Income in Census Tract 110 (2000 Census [2005])

Income in 1999	Number	Percent
Less than $10,000	142	5.4
$10,000 to $14,999	54	2.1
$15,000 to $24,999	218	8.4
$25,000 to $34,999	224	8.6
$35,000 to $49,999	297	11.4
$50,000 to $74,999	479	18.4
$75,000 to $99,000	320	12.3
$100,000 to $149,000	424	16.3
$150,000 to $199,999	159	6.1
$200,000 or more	291	11.2
Households	2,608	100.0
Median Household Income (dollars)	70,313	

Source: U.S Census Bureau, Census 2000 (2005)

Approximately 638 or 24.5 percent of the households in the EJSA have incomes at 50 percent or below the median income. Less than 16 percent of the households (414 households) have incomes less than 30 percent of the area's median income.

Affected Environment — Minority Population

Table 4.14-4 provides a summary of the EJSA racial composition. Racial minorities are 8 to 12 percent (variability due to mixed races) of the total population within the study area. The minority population is predominately Hispanic or Latino (6.9 percent), with the major portion being Mexican (5.2 percent).

Table 4.14-4: Population Racial Composition in the Environmental Justice Study Area (EJSA)

Total Population (One Race)	White	Black or African American	American Indian	Asian	Other	Hispanic or Latino (of any race)
6,149	5,805	21	43	112	163	432
Census Tract Composition	92.4%	0.3 %	0.7 %	1.8%	2.6%	6.9%

Source: U.S Census Bureau, Census 2000 (2005)

2030 Baseline Conditions

No changes to the demography or distribution of race or economic status in the area in the area of Monterey County encompassing the project site that would trigger an Environmental Justice issue, with or without the project.

4.14.2 ENVIRONMENTAL RESOURCE IMPACT STANDARDS AND METHODS

Standards of Significance

No formal, commonly accepted significance criteria have been adopted for Environmental Justice impacts. However, the Presidential Memorandum accompanying the EO directs federal agencies to include measures to mitigate disproportionately high and adverse environmental effects of proposed federal actions on minority and low-income populations. The federal government has developed no specific significance thresholds; however, the following considerations provide the basis of the discussion of potential Environmental Justice impacts.

For purposes of the Environmental Justice analysis, the potentially affected area for this project is the EJSA, Census Tract 110. If a minority and/or low-income population is identified in the affected area and if the technical analysis in the EIS finds that a project would result in significant adverse environmental impacts that cannot be mitigated to a less than significant level, the Environmental Justice analysis must determine whether these impacts would have a disproportionately adverse effect on the minority and/or low-income population. An action that creates disproportionately high and adverse human health and environmental effects on minority or low-income populations would be significant.

Impact Assessment Methodology

The assessment of Environmental Justice issues began with a screening analysis (a federal requirement of NEPA analyses). The purpose of screening is to determine if there exists a minority and/or low-income population within the potential affected area of the Proponent's Proposed Project and alternatives. Minority and/or low-income populations, as defined by EPA's *"Final Guidance for Incorporating Environmental*

Justice Concerns in EPA's NEPA Compliance Analyses (1998)", are identified where either:

- The minority and/or low-income population of the affected area is greater than 50 percent of the affected area's general population; or

- The minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (census tracts are generally appropriate for this analysis).

Countywide statistics were reviewed to determine the percentage of the population classified as non-Caucasian and the percentage classified as Hispanic or Latino, and other representative minority groups. Using the county average for comparison, the Project Area census tract data was evaluated to determine whether the minority population percentages were greater than the county average. If the census tract percentage exceeded the county average, the Project Area could then be evaluated for environmental justice effects based on its minority population.

The second criterion for environmental justice analysis is income. As in the case of minority populations, county-wide data was evaluated to determine the percentage of low-income households and then to compare it to the percentage of low-income households in the project study area (EJSA) census tract. If the census tract percentage exceeded the county average, the Project Area could then be evaluated for environmental justice effects based on income levels.

The comparison analysis of Census Tract 110 data on minority populations and low-income populations to that of the county-wide data determined whether or not the Proponent's Proposed Project and alternatives disproportionately affected low-income and minority populations.

4.14.3 IMPACTS AND MITIGATION

The following impact issue has been defined for Environmental Justice:

- EJ-1: Minority and Low Impact Populations

Proponent's Proposed Project (Dam Thickening)

Issue EJ-1: Minority and Low-Income Populations

Disproportionate effects on minority and low-income populations
Determination: ***less than significant, no mitigation required***

IMPACT

As presented earlier in this EIR/EIS Section, according to the 2000 Census (2005), 92 percent of the EJSA was white. At 7 percent, Hispanics and Latinos constitute the largest minority in the EJSA. The minority population in Monterey County is also

predominately Hispanic or Latino (47 percent). The total minority population (Black or African American, American Indian, Asian, or other) is 8 to 12 percent in the EJ SA.

The minority population percentage of the EJSA is less than the minority population percentage in the general population (Monterey County). The percentage of minority population in the EJSA is well below 50 percent of the countywide geographical area.

According to the 2000 Census (2005), 2.9 percent (51 families) out of 1,769 families in the EJSA were below the income poverty level. Countywide, 13.5 percent of the families were below the poverty level. In California, 14.2 percent of families were below the poverty line.

The low-income population percentage of the EJSA is less than the low-income population percentage in the general population (Monterey County) and in California. The percentage of low-income population in the EJSA would remain below 50 percent of the county's and state's low-income population.

Based on this screening analysis, it is concluded that the minority and low-income populations of the EJSA fall below the EPA thresholds for an "environmental justice" population and that the Proponent's Proposed Project and alternatives would not disproportionately affect any minority or low-income populations. These include Hispanic, Latino, African American, Asian American and/or Native American groups. The Proponent's Proposed Project and alternatives, therefore, do not raise environmental justice issues and, based on EPA's NEPA "Guidelines an Environmental Justice" analysis is not required to demonstrate that the Proponent's Proposed Project would disproportionately adversely affect minority or low-income populations. The Proponent's Proposed Project would occur in communities with low-, middle-, and high-income residents that are composed of minorities and non-minorities; no disproportionate impacts to minority or low-income populations would result from the Proponent's Proposed Project.

MITIGATION

The Proponent's Proposed Project would not have a disproportionate effect on any minority and low-income populations. No mitigation would be required.

Alternative 1 (Dam Notching)

Issue EJ-1: Minority and Low-Income Populations

Disproportionate effects on minority and low-income populations
Determination: ***less than significant, no mitigation required***

IMPACT

Environmental justice impact issue EJ-1 for Alternative 1 would be similar to that described above for the Proponent's Proposed Project. As with the Proponent's Proposed Project, Alternative 1 would not result in disproportionately high or adverse impacts to minority or low-income populations.

MITIGATION

Alternative 1 would not have a disproportionate effect on any minority and low-income populations. No mitigation would be required.

Alternative 2 (Dam Removal)

Issue EJ-1: Minority and Low-Income Populations

Disproportionate effects on minority and low-income populations
Determination: ***less than significant, no mitigation required***

IMPACT

Environmental Justice impact issue EJ-1 for Alternative 2 would be similar to that described above for the Proponent's Proposed Project. As with the Proponent's Proposed Project, Alternative 2 would not result in disproportionately high or adverse impacts to minority or low-income populations.

MITIGATION

Alternative 2 would not have a disproportionate effect on any minority and low-income populations. No mitigation would be required.

Alternative 3 (Carmel River Reroute and Dam Removal)

Issue EJ-1: Minority and Low-Income Populations

Disproportionate effects on minority and low-income populations
Determination: ***less than significant, no mitigation required***

IMPACT

Environmental Justice impact issue EJ-1 for Alternative 3 would be similar to that described above for the Proponent's Proposed Project. As with the Proponent's Proposed Project, Alternative 3 would not result in disproportionately high or adverse impacts to minority or low-income populations.

MITIGATION

Alternative 3 would not have a disproportionate effect on any minority and low-income populations. No mitigation would be required.

Alternative 4 (No Project)

Issue EJ-1: Minority and Low-Income Populations

Disproportionate effects on minority and low-income populations
Determination: ***less than significant, no mitigation required***

IMPACT

Under Alternative 4, low-, middle-, and high-income households that are composed of minorities and non-minorities would all be affected by potential dam failure or flooding

upset. The potential risk of upset would not disproportionately affect any specific income level, or ethnic, or racial groups.

MITIGATION

Alternative 4 would not have a disproportionate effect on any minority and low-income populations. No mitigation would be required.

4.15 OTHER ENVIRONMENTAL EFFECTS

Several environmental resource areas and issues were considered for evaluation and dismissed as not presenting the potential for significant effects. These included socio-economic effects (employment, population, and housing) and effects on public utilities. Each of these is discussed briefly below.

EMPLOYMENT

Construction for the Proponent's Proposed Project and alternatives is expected to occur during two phases. The Proponent's Proposed Project and alternatives would employ a range of 15 to 80 employees during the two phases of construction. The average number of employees would be approximately 45, but the number would vary during each construction year, depending on the tasks. The maximum number of workers (80) would be required for less than one year. According to the US Census, employment in Monterey County in 2000 for populations 16 and older was 299,915, with 184,789 (62 percent) in the labor force. Unemployment totaled 15,658 (5.2 percent) in 2000.

CAW anticipates hiring from within the County or in surrounding counties (driving distance to the project site). There is a sufficient supply of workers in the County. The Proponent's Proposed Project and alternatives would not create a need for additional workers; therefore, no impacts are anticipated to employment.

HOUSING

According to the US Census Bureau, the total number of housing units in Monterey County in 2000 was 131,708, with a vacancy rate of 8 percent (10,472 units). The homeowner vacancy rate was 1.4 percent and the rental vacancy rate was 2.9 percent.

The Proponent's Proposed Project and alternatives would not displace existing or proposed housing. There would be an adequate supply of housing/lodging for construction crews in Monterey County, as most of the workers would be hired locally and would not need housing. No impacts are anticipated to housing.

POPULATION

According to the US Census Bureau, the total population for Monterey County in 2000 was 401,762. The maximum number of workers anticipated for the Proponent's Proposed Project and alternatives is 80, for a limited time period, which represents less than a 0.01 percent change to the County's population. This percent change would only occur if all workers came from outside the area, which is not likely. CAW intends to hire workers locally, from Monterey County and/or surrounding counties.

There would be no direct or indirect increases in population as a result of project, nor would the project induce substantial growth in the area. The project would not cumulatively exceed official regional or local population projections. Therefore, no impacts are anticipated to population.

PUBLIC UTILITIES

There are no known public utilities in the Project Area (Monterey County Public Works Department, pers. comm. 8/9/07). For any construction activity occurring in the Monterey County right-of-way, such as during road improvements on San Clemente Drive, Cachagua Road, or Carmel Valley Road, buried cables would be identified through the Monterey County Public Works permitting process. It is not anticipated that public utilities would be impacted by the Proponent's Proposed Project or any of the alternatives.

CHAPTER 5.0

CEQA & NEPA CONSIDERATIONS

5.0 CEQA & NEPA CONSIDERATIONS

Both the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) require analysis of significant irreversible changes. These include significant and unavoidable adverse impacts; cumulative impacts; irreversible and irretrievable commitment of resources; relationships between short-term uses and long-term productivity; and growth-inducing impacts. NEPA also requires analysis of natural or depletable resources. These are described in the following sections.

5.1 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Unavoidable significant adverse impacts are those effects that would significantly affect either natural systems or other community resources, and cannot be mitigated to less than significant. Nearly all the potentially significant impacts associated with the San Clemente Dam Seismic Safety Project action alternatives identified in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) could be reduced to less than significant levels by mitigation measures specified in this EIR/EIS. Almost all of the potentially significant unavoidable impacts are short-term and associated with construction. Significant, unavoidable impacts are summarized below by environmental resource area.

5.1.1 GEOLOGY & SOILS

Under the No Project Alternative, there is a significant risk that seismic activity could lead to the failure of San Clemente Dam (SCD) leading to further impacts discussed below.

Under the No Project Alternative, the left dam abutment could erode due to overtopping of the Dam under a Probable Maximum Flood (PMF), leading to dam failure.

5.1.2 HYDROLOGY & WATER RESOURCES

The Proponent's Proposed Project and Alternative 1 would have no impacts in this resource area that could not be reduced to less than significant with mitigation using the Sediment Operations and Management Plan (SOMP, Appendix J).

Alternatives 2 and 3 would cause significant and unavoidable short-term changes in riverine sediment transport, deposition, and composition in the Carmel River downstream of SCD resulting from construction. Both alternatives would entail significant and unavoidable increases in the frequency of high suspended sediment concentrations in the Carmel River downstream of SCD.

Alternative 2 would increase sediment deposition to the Carmel River after the Dam is removed due to the inability of excavation to retrieve all sediment deposits and due to the restoration of sediment transport past the dam site. These effects would also have a significant effect on sediment deposition and channel geometry in some reaches of the

lower Carmel River and could cause changes in the bed elevation that could significantly change the 100-year flood elevation.

Under the No Project Alternative, there is a significant risk a PMF could cause the failure of SCD, leading to or increasing downstream flooding.

5.1.3 WATER QUALITY

Under the Proponent's Proposed Project and Alternative 1, operation of sluice gates in the Dam to manage sediment accumulation behind the Dam for fish passage would cause suspended sediment increases in the reservoir and in the Carmel River downstream of, resulting in elevated turbidity levels. Operation of sluice gates would likely occur once or twice a year over the life of the Dam. During sluicing, up to 2.4 AF of sediment could be discharged downstream of the Dam over a two-hour time period.

Since this would occur on the rising limb of the hydrograph when flows are expected to continue increasing, and the river would already be sustaining a higher level of turbidity, a large proportion of the sediment would be carried downstream as suspended sediment. This may cause increased turbidity levels that would likely extend more than one mile downstream. The duration of elevated turbidity would depend on the actual length of time that sluicing was conducted as well as the actual flows that occurred. It is estimated that elevated turbidity would last from 12 to 36 hours, perhaps longer. Even though the releases would be intermittent, temporarily discharging small amounts of sediment, water quality degradation could not be mitigated to a less than significant level in the reservoir and would therefore, be a short-term, significant and unavoidable impact.

Under the Proponent's Proposed Project and all alternatives, lowering of water levels of the reservoir (for construction) would increase the turbidity levels and decrease dissolved oxygen (DO) levels. In addition to fine suspended solids, the release of stream channel porewater from the Carmel River and San Clemente Creek into the reservoir would cause iron oxidation to occur, further increasing turbidity and decreasing DO levels. During and following drawdown, movement of sediments previously deposited near the mouths of the Carmel River and San Clemente Creek could slump and shift into the reservoir. This sediment movement could cause further release of anaerobic porewater, resulting in lowered DO. Alternatives 1, 2, and 3 would also increase turbidity during the excavation of sediment in the reservoir. Because water quality degradation could not be mitigated to a less than significant level in the reservoir, these would be short-term, significant and unavoidable impacts.

5.1.4 AQUATIC BIOLOGY

Under the Proponent's Proposed Project and all action alternatives, significant, unavoidable impacts to steelhead and/or their habitat would occur for the same three impact issues. The actions causing significant and unavoidable impacts include: 1) dewatering of channels for construction, or dam removal activities, 2) diversion of the

Carmel River and San Clemente Creek around San Clemente reservoir and dam site, and 3) reservoir dewatering to prepare site for construction or deconstruction activities.

Under the Proponent's Proposed Project, short-term loss of aquatic habitat during construction would be the primary cause of significant and unavoidable impacts to steelhead. Aquatic habitat in a short section of Tularitos Creek and in the Carmel River from the plunge pool downstream for about 400 feet downstream of the Dam would be unavoidably lost due to dewatering during construction. The diversions of the Carmel River and San Clemente Creek would affect rearing habitat upstream of the reservoir for about 1,200 feet in the Carmel River and would affect rearing habitat for juvenile steelhead for the duration of the construction season in the Carmel River. In addition, the drawdown of the reservoir would cause a temporary loss of steelhead rearing habitat in the reservoir for the duration of the construction season. Habitat supporting juvenile steelhead would be lost as a result of these actions. Steelhead would be rescued and relocated to other habitats resulting in handling stress and some potential mortality. Long-term impacts from these activities are less than significant. Even with short-term, significant, and unavoidable impacts, an upgraded fish ladder and implementation of sediment management activities under the Proponent's Proposed Project would improve the long-term environment for steelhead over current conditions.

Under Alternative 1, impacts would occur to rearing habitat in the Carmel River from dewatering and would be the same as the Proponent's Proposed Project. Impacts to the Carmel River due to construction diversion would be much greater, extending upstream for about 5,000 feet on the Carmel River and 1,350 feet on San Clemente Creek and would occur for three seasons instead of only one, thus affecting many more steelhead in the Carmel River and San Clemente Creek than the Proponent's Proposed Project. The seasonal loss of rearing habitat in the reservoir due to drawdown would be greater, since it would occur for three consecutive years during the construction season. In addition, impacts from sediment removal in the reservoir would cause significant and unavoidable impacts to upstream riverine resources. Approximately 4,700 feet of the Carmel River and about 1,350 feet of San Clemente Creek would become unavailable as rearing habitat for the two years it would take to remove deposited sediment from behind the Dam. All of the existing habitat along the channels would be eliminated during CY 3 as deposited sediment is removed from the inundation area. Full recovery to functional channels may take from three to seven years after restoration is completed. Long-term impacts from these activities are less than significant. Even with short-term, significant, and unavoidable impacts, an upgraded fish ladder and implementation of sediment management activities under Alternative 1 would improve the long-term environment for steelhead over current conditions.

Under Alternative 2, significant, unavoidable impacts would be similar to Alternative 1, but would occur for three construction seasons upstream of SCD. Diversions and loss of flow would cause the loss of seasonal rearing habitat along the same lengths of channel in Carmel River upstream and downstream of SCD, and in San Clemente Creek upstream of the Dam. Similar losses of rearing habitat in the reservoir due to dewatering

would also occur, but would extend over three construction years. Channels would be completely removed during sediment excavation then reconstructed along their former alignments. In addition, impacts of sediment released from the former reservoir would have significant and unavoidable impacts to downstream reaches of the Carmel River in the short-term, but would produce beneficial impacts to fish passage and aquatic habitat conditions in the long-term.

Under Alternative 3, impacts would be much less than those described for Alternative 2 for dewatering of channels for construction, or dam removal activities. Impacts from the diversion of the Carmel River and San Clemente Creek around San Clemente reservoir would result the loss of 3,200 feet of the Carmel River upstream of the Dam and about 1,350 feet for San Clemente. Impacts from reservoir dewatering to prepare the site for sediment removal and channel reconstruction would be similar to the Proponent's Proposed Project. Impacts to upstream resources in the Carmel River would be limited to river crossings of the upstream access road, but the existing riverine and riparian habitat in the Carmel River upstream of about 3,200 feet from SCD would remain in tact. In addition, impacts from sediment removal would have significant and unavoidable impacts in the short-term, but beneficial impacts to fish passage and aquatic habitat conditions for the long-term.

Under Alternative 4, no construction would occur; therefore, there would be no construction related effects. Annual drawdowns would continue to result in some loss of fish and habitat; this condition would self-correct reservoir water levels are restored and the fish ladder becomes inoperable. Impacts to fish migrating both upstream and downstream would be significant and unavoidable.

5.1.5 VEGETATION AND WILDLIFE

Under the Proponent's Proposed Project and all alternatives except Alternative 4 (No Project), injury or loss of California red-legged frogs (CRLF) and western pond turtles may occur during rescue operations associated with construction activities, including the reservoir dewatering. Injury or loss of CRLF may occur due to handling of frogs during relocation, and because some relocated frogs and tadpoles may fail to adjust to the new environment at the ponds used for relocation. Provisions for potential injury or loss will be part of the United States Fish and Wildlife Service (USFWS) Biological Opinions (BOs) for the project and its alternatives.

In addition to potential injury or loss of CRLF and western pond turtles, under Alternatives 1, 2, and 3, removal of sediment from San Clemente Reservoir would also include some injury or loss of Coast Range newt larvae, and western pond turtle juveniles and hatchlings from the sediment bed before commencing vegetation removal or sediment excavation, or if individuals are missed in the rescue operation.

Under Alternative 3 brushland and riparian habitat clearing and channel excavation would remove some habitat for aquatic species including the CRLF, Coast Range newt

and the western pond turtle. These activities may also affect other special-status terrestrial wildlife species, particularly the Monterey dusky-footed wood rat. Impacts on terrestrial species would be assessed by preconstruction survey and flagging of special-status species habitat for avoidance during construction.

While it is difficult to determine whether the loss of CRLFs and other species that are not rescued or that are injured or die during rescue and relocation operations is significant, these losses along with the temporary loss of habitat for the CRLF cannot be fully mitigated and would be significant in the short-term. However, the CRLF Program, which is part of the mitigation provided, would restore additional sites as mitigation habitat for CRLFs and other species. This mitigation would improve habitat and provide a long-term beneficial impact.

5.1.6 AIR QUALITY

Under the Proponent's Proposed Project and all action alternatives, there would be an increase in NO_X emissions. Although small, there may be an incremental significant, unavoidable impact on ambient air quality in distant residential areas or at the Dam site from NO_X emissions because these emissions are above the mass emissions significance threshold. The nearest residential receptors are located far enough from the Dam site (3,900 to 5,300 meters) that only a limited amount of dispersed NO_X would be transported by wind due to diffusion.

Under the Proponent's Proposed Project and all action alternatives, estimated emissions of fugitive dust (PM_{10F}) could potentially exceed the PM_{10} threshold of 82 lb/day by an amount that would be significant; thus requiring mitigation in order to minimize ambient air impacts. This would primarily be due to travel on unpaved roads between the filter plant and dam.

There are several feasible mitigation measures that address the many sources of PM_{10} during the construction phase of a project (e.g., grading, wind erosion, entrained dust). Common measures include watering, chemical stabilization, or reducing surface wind speeds with windbreaks. Other measures include practical and cost-effective NO_X controls for diesel vehicles and equipment, such as Viscon, and use, where possible, of state-certified construction equipment.

The air quality impacts are minor and short-term. However, even with implementation of feasible mitigation measures, NO_X and PM_{10F} emissions would not be reduced below the mass emissions significance threshold and would be significant and unavoidable.

5.1.7 NOISE

Under the Proponent's Proposed Project and all action alternatives, significant, unavoidable impacts on noise would occur as a result of project construction activities including truck traffic and operation of the batch plant. Although these effects would be localized in the Project Area, the resultant noise levels, at some times, at some

locations may be above the normally acceptable range and/or more than 5 dBA above background. Even though these instances would be transient and temporary, they would be significant and unavoidable.

5.1.8 TRAFFIC AND CIRCULATION

Under the Proponent's Proposed Project and all action alternatives, significant unavoidable impacts on quality of life and traffic safety for residences along San Clemente Drive would occur due to the increased truck traffic. For the Proponent's Proposed Project, mobilization and demobilization of construction equipment using San Clemente Drive is expected to occur over a period of several weeks and involve 15 to 30 trips with heavy equipment. Thereafter, five to 10 trips per day on San Clemente Drive would be used for worker, supervisor, and maintenance access over a period of up to eight months of CY 3 during the construction of the Tularcitos Access Road. For Alternatives 1, 2, and, 3, San Clemente Drive would be needed to provide access below the Dam, which is not accessible from the Chachagua route. San Clemente Drive would be used for initial mobilization of equipment for several weeks at the beginning of each construction year, an occasional truck and workers during the project, and demobilization at the end of each construction year for a period of several weeks. The amount of trips during that several week period is expected to be 15 to 30 trips with heavy equipment. It is anticipated that less than 25 percent of the total construction traffic would use San Clemente Drive for access below the Dam for Alternatives 1, 2, and 3. In addition for those alternatives, the number of trips added to San Clemente Drive is not projected to exceed 12 trips per day. Although the additional trips do not change the level of service or street capacity of San Clement Drive, they may affect the quality of life for the residents who are not used to any outside traffic.

A number of mitigation measures have been proposed which range from building new access roads, limiting traffic based on time of day and type of load, and providing notification to residents. Although the changes to the existing traffic on San Clemente Drive would be short-term, even with mitigation measures, out of an abundance of caution, they would be significant and unavoidable in large part because they affect the quality of life for the residents.

Alternatives 1 and 2, and 3 require the use of the Jeep Trail to transport sediment to the 4R sediment disposal site. During the construction of the Jeep Trail improvements, non-project related traffic traveling on the Jeep Trail would be subjected to delays. The volume of traffic currently using the Jeep Trail is low. However, the Jeep Trail provides access to non-project related parcels in the area and construction activity on the trail would impact access to those parcels. Increased traffic and construction related delays would occur during CY 4, primarily from June through October. At this time, it is not possible to precisely estimate the delay that non-project traffic would incur on the Jeep Trail during construction of improvements to the Jeep Trail. The amount of delay that a motorist on the Jeep Trail would experience during the road construction period would depend on the construction activity underway at the time the motorist arrives at the

section under construction, and the amount of time required by the construction crew to create a passable surface for the motorist. If the other users of the Jeep Trail can provide the construction contractor with a schedule for their use of the Jeep Trail, delays might be reduced to less than significant. Because the amount of time that would be required to create a passable road surface cannot be known in advance, and the schedules of other users are not known, out of an abundance of caution, the impact of the project during the one-year period of construction of improvements to the Jeep Trail would be significant and unavoidable.

5.1.9 CULTURAL RESOURCES

Significant and unavoidable impacts include the permanent alteration of the OCRD and associated Fish Ladder); thickening, notching, or demolition of SCD; replacement of the SCD Fish Ladder; and altering the character of the setting of significant historic resources and the visual character of SCD Historic District.

5.1.10 AESTHETIC RESOURCE

Comments from homeowners in the Sleepy Hollow Subdivision stated that two homes would have their view obstructed by the concrete batch plant. Field reconnaissance results, based on visibility from the street level, were that the batch plant would not be visible. Whether visible or not, the batch plant would be a temporary structure that would be removed within one year of its construction. The distance of the batch plant from the Sleepy Hollow Subdivision is approximately 2,500 feet. This distance, coupled with obstructions from vegetation, would lessen the batch plant visual impacts to Sleepy Hollow. Any visual impacts would be short-term and construction-related; no long-term visual effects would occur to Sleepy Hollow homeowners as a result of construction and operation of the concrete batch plant. Although the batch plant would be some distance from the two residences and the impact would be short-term, it is difficult to say with certainty that the impacts would be less than significant and they are therefore would be short-term significant and unavoidable.

During construction under Alternatives 1 and 2, private landowners of the Stone Cabin would have views of the sediment disposal site adjacent to the Jeep Trail and the sediment conveyor overcrossing, which would be above the Jeep Trail. A relatively small segment of the sediment disposal site would be visible to the landowners traveling on the Jeep Trail for a short duration of travel time. The sediment conveyor overcrossing together with the sediment pile would degrade the existing visual character or quality of the site and its surroundings during construction. Mitigation measures for short-term impacts would include screening the portion of the sediment disposal site adjacent to the Jeep Trail with vegetation during construction. Mitigation measures for long-term visual impacts would include revegetation of the sediment disposal site and the removal of the sediment conveyor overcrossing. Even with mitigation measures, it is difficult to say with certainty that the impacts would be less than significant; and would be short-term, significant, and unavoidable.

5.1.11 LAND USE

The alternatives that require the use of Site 4R (Alternatives 1 and 2) would use existing park land for sediment disposal. Although designated as open space use, the area is currently inaccessible for public use (except for authorized users of Stone Cabin). Out of an abundance of caution, this impact would be short-term, significant, and unavoidable. Revegetation activities would reduce this impact to less than significant in the long-term.

5.1.12 RECREATION

Travel by recreational users on the Jeep Trail would be disrupted for the period of construction for Alternatives 1, 2, and 3. The area is currently inaccessible except authorized users of Stone Cabin. Although there are no current plans for the area, Park District owned land which has been proposed as a sediment disposal site (Site 4R) would also be disrupted during the period of construction for Alternatives 1 and 2. Although resulting in relatively minor disruptions, these impacts occur in an area that is rural in nature and with few outside disruptions. Out of an abundance of caution, these impacts would be significant and unavoidable, short-term impacts. Revegetation activities, along with l leaving use of the improved road to the discretion of the MPRPD would reduce these impacts to less than significant in the long-term.

5.2 GROWTH INDUCEMENT

CEQA requires that any growth-inducing aspect of a project be discussed in an EIR. This discussion should include consideration of ways in which the project could directly or indirectly foster economic or population growth, or the construction of additional housing, in adjacent and/or surrounding areas. Projects which could remove obstacles to population growth (such as major public service expansion) must also be considered in this discussion. According to CEQA, it must not be assumed that growth in any area is necessarily beneficial, detrimental or of little significance to the environment.

The Proponent's Proposed Project is a seismic retrofit of an existing dam structure, required by the Division of Safety of Dams (DSOD). The existing dam and reservoir are currently used in conjunction with the Los Padres Dam and Carmel Valley aquifer wells as a source of water diversions to the Carmel Valley Filter Plant (CVFP). The reservoir also serves as the primary source of water for the unincorporated Carmel Valley Village. The water storage capacity of San Clemente Reservoir has diminished from approximately 1400 AF (with gates down) at the time of construction (1921) to its current level of approximately 100 AF due to siltation.

None of proposed San Clemente Dam Seismic Safety Project alternatives would increase the capacity of the existing reservoir, or increase water supply. They would not change how the operational water releases occur for fish passage under the annual Memorandum of Agreement (MOA) among the California American Water Company (CAW), the California Department of Fish and Game (CDFG), and the Monterey Peninsula Water Management District (MPWMD). No water would be available for additional growth, and no other potential growth-inducing effects have been identified.

The project would largely employ a local construction workforce and would not increase local housing demand or population. The project is not considered growth-inducing.

5.3 CUMULATIVE IMPACTS

5.3.1 INTRODUCTION

Cumulative impacts may result from individually minor but collectively significant effects of several projects over a period of time. Cumulative effects may occur when the incremental impacts of a Proponent's Proposed Project, added to those of other closely related past, present, and reasonably foreseeable probable future projects, become environmentally important.

Under CEQA, "cumulative impacts" refers to two or more environmental effects that, when combined, are "considerable" or which compound or increase other environmental impacts. NEPA defines "cumulative impact" as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. NEPA and CEQA guidelines require a discussion of cumulative impacts when they are significant. The discussion should reflect the severity of the impacts and their likelihood of occurrence, and should be guided by the standards of practicability and reasonableness.

CEQA requires either (1) a list of past, present, and reasonably foreseeable future projects producing related or cumulative impacts, including those projects outside the control of the lead agency ("list approach"); or (2) a summary of projects contained in an adopted general plan or related planning document that is designed to evaluate regional or area-wide conditions ("plan approach").

CEQA also requires a summary of the expected environmental effects to be produced by those projects, with specific reference to additional information stating where that information is available; and a reasonable analysis of the cumulative impacts of the relevant projects. An EIR must examine reasonable options for mitigating or avoiding any significant cumulative effects of a Proponent's Proposed Project. In some situations, the only feasible mitigation for cumulative impacts may involve the adoption of ordinances or regulations, rather than the imposition of conditions on a project-by-project basis.

5.3.2 APPROACH

Cumulative impact analysis requires selection of Reasonably Foreseeable Future Actions (RFFA). These are projects that are expected to occur within the same physiographic region and time frame as the Proponent's Proposed Project, but are not yet in existence. While there is not an obligation to consider highly speculative projects (e.g., a project that is in its most preliminary stages of formulation), this EIR/EIS is not limited to projects that have received regulatory approval and are awaiting construction. The following classes of RFFAs were defined:

- Projects of Regional Significance. These are projects large enough to have a detectable influence at the Carmel River watershed or CAW service area scale (geographic criteria), or which impact a specific resource of regional importance which would also be affected by the action alternatives. This category includes completed projects that are just beginning to operate, projects in construction, projects that have been permitted but have not yet begun construction, projects that are in the permitting process and projects that are in the initial development process (temporal criteria). Projects that have been recently completed are included in the No Project Alternative (base case).

- Regional Programs. In addition to projects there may be development or regulatory programs that are regional in scope. An example would be management plans developed by Monterey County that would result in changes to land use and development.

Not included in the RFFA category are ongoing trends in the use or degradation of regional resources (such as ongoing siltation behind Los Padres Dam (LPD), or increased water consumption, wastewater effluent, or other derivative effects of land development from urbanization), or regulatory programs that are already underway to manage regional environmental resources (such as air and water quality improvement programs). These trends are included in the No Project Alternative or base case and are discussed in each resources section in Chapter 4 under the 2030 baseline section.

A list of RFFAs to be analyzed was compiled using the following steps:

- An initial list of possible RFFAs was compiled and expanded in discussion with the Lead and Cooperating Agencies. Information was sought on specific projects or programs that should be considered. A summary of environmental documents or permits issued in the region for the past 5 years was obtained from Monterey County. Possible RFFAs were discussed with CAW, MPWMD, and others involved in the Carmel River watershed, including the Lead and Cooperating Agencies.

- To be included, an RFFA needed to be under active consideration; have recently completed or be at some active stage of environmental documentation; be completed or operational within the timeframe being considered for the PPP and its alternatives (2030 for operational consideration and three to four years for construction). Projects were excluded that have made no progress to initiate the permitting process with the past two years, or if started, have not completed permitting within the past two years, if it appears that the project is not moving forward.

- The candidate RFFAs were briefly reviewed to determine their regional significance and pertinence for the cumulative impact analysis to determine whether the RFFA, in combination with the Proponent's Proposed Project and other action alternatives (collectively, the "action alternatives" or "project alternatives"), has the potential to affect the same resources.

- Any existing impacts analysis was obtained for the selected projects, and a brief project description was prepared for resource specialists to use as the basis for the cumulative impact assessment.

5.3.3 PROJECTS CONSIDERED FOR CUMULATIVE ANALYSIS

The following projects, plans and programs were considered for inclusion as RFFAs:

- Monterey County Development Projects
- Monterey Peninsula Regional Park District development in the Carmel River watershed
- MPWMD Carmel River Management Program
- Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan and Integrated Coastal Watershed Management Plan
- Regional Water Supply Projects
- Carmel River Watershed Assessment and Action Plan
- Carmel River Lagoon (Sand Bar) Management Plan
- Growth within the Region

It is important to note the construction periods for cumulative projects. Presently, construction of the Proponent's Proposed Project or its alternatives would last for two to three construction seasons. If permitting is complete, preparatory work such as road improvements could start, at the earliest, in 2009. If construction schedules do not overlap, temporary construction impacts such as those relating to traffic or sediment would not be cumulative with other projects.

Monterey County General Plan

The Project Area is under the jurisdiction of the Monterey County General Plan (GP 2006), which was adopted in January of 2007. Potential impacts to land use, population, housing, and utilities were evaluated in Chapter 4, considering a baseline environment projected through the year 2030. Analysis indicated that no project-related impacts to these areas are anticipated in this period. No cumulative impacts are anticipated in regards to the goals, policies, and land use designations contained in the Monterey County General Plan.

Carmel Valley Master Plan

A Draft Subsequent EIR was released in August 2007 for changes to the Carmel Valley Master Plan (CVMP), including designing an update of the circulation and traffic impact fee elements and preparing a program EIR on the new circulation improvements to

address traffic concerns. The project alternatives would have traffic and circulation impacts on the area covered by the CVMP during the period of construction and mitigation measures are identified in this EIR/EIS. With implementation of the mitigation measures identified, no potential significant adverse cumulative impacts are anticipated with regard to traffic in the area.

Monterey County Development Projects

To identify possible RFFAs in the Carmel River watershed, a search was conducted of Monterey County permit actions on parcels within five miles of SCD. Monterey County has approved permits for approximately 65 projects in this area since January 2000. Most of these are individual residences. Four projects are large enough to be of potential regional significance. These included:

- Rancho San Carlos Partnership Project. This development consists of the proposed construction of a 30,829 square foot employee operations center to include a mechanical shop, a carpentry building, a golf vehicle garage, a chemical storage building with mixing area, a landscaping building, an emergency vehicle garage, and operations vehicle garage, an operations office, an employee center and other small outbuildings. The property is located at 121 Rancho San Carlos Road, Carmel Valley. A Combined Development Permit was granted in 2002 and the County has recorded no activity on the project since that time. It is excluded from further analysis because it has been inactive for more than two years and does not appear to be a RFFA. This project would occur in an existing developed area. The infrastructure is in, the only things that are being constructed would be the private homes and all of those sites have already been purchased. No potential significant adverse cumulative effects on resources that may be affected by the San Clemente Dam Seismic Safety Project action alternatives are foreseen.

- Carmel Valley Recreation and Parks Museum Facility Project. The project includes construction of a 2,400 square foot museum on the first floor with a 400 square foot storage room on the second floor. The property is located at 77 West Carmel Valley Road, Carmel Valley. This project occurs in an existing developed area. No potential significant adverse cumulative effects on resources that may be affected by the San Clemente Dam Seismic Safety Project action alternatives are foreseen.

- Garland Ranch Regional Park Addition. The park is proposing to add 1,300 acres to the existing Garland Ranch Regional Park, located southerly and northerly of Carmel Valley Road, adjacent to the Garland Ranch Regional Park. This project was completed in 2004 and is included in the baseline for impacts analysis in Chapter 4 of this EIR/EIS. It is therefore excluded from cumulative effects analysis.

- White Oak Plaza Project. This project includes the development of approximately 7,267 square feet of new building area and construction of additional parking; development of 5,667 square feet of buildings for office and light commercial uses; a 1,600 square-foot restaurant; and additional parking spaces. The property is located at 27 East Carmel Valley Road, Carmel Valley, in the Carmel Valley Village Area.

This project occurs in an existing developed area. No potential significant adverse cumulative effects on resources that may be affected by the San Clemente Dam Seismic Safety Project action alternatives are foreseen.

- Rancho Cañada Village. An application has been filed with Monterey County for an approximately 280-unit subdivision that includes a mixed-income neighborhood using traditional design principles (compact, pedestrian-friendly). The proposed subdivision design is intended to address workforce housing needs of Carmel Valley and surrounding areas. The subdivision would include approximately 280 units (with a mix of single-family, town homes, and condos/flats), trails, and open spaces. Affordable and workforce units would comprise 50 percent of the project. This project would displace an existing 18-hole golf course and would use 72 AF of water per year, which represents an annual water savings of 75 to 100 AF as compared to current golf course irrigation use. The project would reduce traffic from the closure of the golf course and a traffic mitigation fee of approximately $2.5 million for Carmel Valley Road improvements would be paid by the project. The project includes enhancement of riparian and steelhead habitat on about one mile of the Carmel River, including a 26-acre habitat preserve. The project would have generally beneficial impacts on resources that would be cumulatively offsetting to any incremental impacts from the San Clemente Dam Seismic Safety Project. Therefore, it would require no additional mitigation for cumulative impacts. No potential significant adverse cumulative effects on resources that may be affected by the San Clemente Dam Seismic Safety Project action alternatives are foreseen.

Monterey Peninsula Regional Park District Development in Carmel River Watershed

The MPRPD-owned land in the Project Area is currently closed to public access pending the development of a management plan. The plan would contain a public access plan of the park-owned land in the Project Area (pers. comm. Tim Jensen 2006). The development of a park management plan is a Reasonably Foreseeable Future Action. Potential visual impacts to future park users are likely to be less than significant or beneficial. The action alternatives would not affect the visual landscape near the lands managed by the MPRPD including the access roads. The roads would be improved as part of Alternatives 1, 2, and 3, but would still be dirt roads. Therefore, there would be no visual impact as a result of the road improvements. Removal of accumulated sediment under Alternatives 1, 2, and 3 would restore part or all of the Carmel River/San Clemente Creek in the reaches that traverse MPRPD lands to a free-flowing stream, which would have a beneficial aesthetic effect. Under the Proponent's Proposed Project and in other sections of the river, there would be no change. With the removal of accumulated sediment, the long-term visual effects to the riverfront would therefore be either less than significant or positive for future park users.

In addition, for future park users, the design of the diversion dam for the bypass alternative (Alternative 3) is permeable. The intention is to allow seepage that will maintain a high water table in the area downstream of the diversion, so that habitat for

riparian species such as the CRLF will persist. Under the Proponent's Proposed Project, wetlands in these areas would not be affected. Under Alternative 1, sediment excavation would remove some wet areas, which should reestablish with time. Under Alternative 2, all wetlands would be removed. The visual effects of changes to wetlands would be less than significant under the Proponent's Proposed Project and Alternative 3; and significant and unavoidable under Alternatives 1 and 2 (but limited to the short-term under Alternative 1).

MPWMD Carmel River Management Program

The MPWMD has historically implemented an annual program of projects in the Carmel River addressing such objectives bank stabilization, and fish enhancement. These actions, going forward, are now incorporated in the Integrated Regional Water Management Plan (IRWMP), discussed below.

Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan and Integrated Coastal Watershed Management Plan

The IRWMP was released in draft form in July 2007. It seeks to integrate many previous plans and strategies addressing environmental resources in the region, and to comprehensively address the future management of water resources. These include:

- Habitat conservation and restoration
- Critical Coastal Areas Program (storm water planning)
- Water supply planning
- Groundwater management
- Flood management
- Water conservation
- Recycling and treated wastewater
- Wetlands
- Recreation
- Desalinization
- Conjunctive water use
- Carmel River watershed planning

IRWMP objectives address local and regional water supply planning; management of surface water and groundwater; augmentation of water supply; ecosystem restoration; water quality improvement; recreation/public access opportunities; conflict resolution; and flood control. The plan includes the action items from the 2004 Carmel River Watershed Assessment and Action Plan and the 1984 Carmel River Management Plan.

The IRWMP is intended to improve the Carmel River watershed environment, and actions taken under the plan probably would be beneficial and cumulatively offsetting to any incremental impacts from the San Clemente Dam Seismic Safety Project. Beneficial impacts would require no additional mitigation for cumulative impacts. No potential significant adverse cumulative effects on resources that may be affected by the San Clemente Dam Seismic Safety Project action alternatives are foreseen by implementation of the IRWMP. Potential cumulative impacts for specific projects or types of projects included in the IRWMP are discussed below.

Regional Water Supply Projects

Associated with the draft IRWMP is a matrix of water projects, including the following:

- Coastal Water Project (CAW)
- North Monterey County Desalination Project (Pajaro/Sunny Mesa Community Services District [P/SM])
- Seaside Basin Groundwater Replenishment Project (MRWPCA)
- Phase 1 Aquifer Storage and Recovery (Seaside Basin) (MPWMD)
- Marina Coast Water District Regional Urban Water Augmentation Project (Marina Coast Water District [MCWD]) and Monterey Regional Water Pollution Control Agency [MRWPCA])
- Sand City Desalination Project (MPWMD)
- Sand City Water Supply Project (City of Sand City)

The water supply alternatives considered by the plan are being independently pursued by the various proponents identified above. It is unlikely that all of them would be constructed or needed, although some will be. It is not yet clear which of these regional water projects will move forward. For example, the Proponent's Environmental Assessment (PEA) for the Coastal Water Project states "It is unlikely that both the Proponent's Proposed Project and the MPWMD Sand City project would be constructed, given that they are intended to achieve the same objective of replacing existing supply from the Carmel Valley Aquifer as specified by the State Water Resources Control Board (SWRCB) Order 95-10."

Environmental documentation is in process for some of the projects, and has not begun for others, as follows:

- Coastal Water Project: PEA prepared, California Public Utilities Commission (CPUC) preparing to initiate Draft Environmental Impact Report (DEIR)
- North Monterey County Desalination Project: preparing to initiate DEIR
- Seaside Basin Groundwater Replenishment Project: DEIR anticipated to be initiated in late 2007
- Phase 1 Aquifer Storage and Recovery: EIR certified in August 2006
- Marina Coast Water District Regional Urban Water Augmentation Project: DEIR distributed June 2004
- Sand City Desalination Project: not initiated
- Sand City Water Supply Project: Draft EIR published in October 2000

Cumulative impacts for some of these projects (the desalinization projects) are addressed in the Coastal Water Project PEA. Most of these projects are located out of the area in which effects of the San Clemente Dam Seismic Safety Project would occur for most environmental resources. Potential cumulative effects could include:

- Air Quality Impacts
- Traffic impacts, where construction windows overlap
- Hydrologic impacts on the Carmel River
- Aquatic biology impacts resulting from hydrologic impacts

The San Clemente Dam Seismic Safety Project has no effect on water supply (see Section 4.2), so there is no potential cumulative effect on this resource. The potential that the above projects will be constructed at all, let alone at overlapping times with any of the action alternatives is speculative at best, so cumulative effects from traffic and other short-term construction impacts cannot be adequately defined for analysis although they could add to existing impacts and are discussed below under each resource section. The potential for hydrologic impacts (and indirectly, impacts to aquatic biology) could arise from two sources:

- Direct impacts from the diversion of Carmel River winter flows occur under one of the projects (Seaside Basin project).

- Indirect benefits to Carmel River flows could occur if these projects supply water to CAW service area, resulting in reduced pumping from CAW wells in continuity with the Carmel River.

These potential cumulative effects are analyzed below under each resource section.

Coastal Water Project

The project consists of a seawater-to-potable-water desalination facility located near the community of Moss Landing in the northern part of Monterey County. A product water conveyance pipeline would run approximately 19 miles in a general southerly direction until it connects to the existing CAW water distribution system in the CAW service territory, generally including the cities of Seaside, Sand City, Monterey, Del Rey Oaks, Pacific Grove, and Carmel-by-the-Sea. In addition, the pipeline would have a turnout to aquifer storage and recovery (ASR) facilities, which would be approximately four miles inland, near Seaside. Several water storage tanks, pumps, and other facilities would be located along the pipeline and in the ASR component of the project. The ASR facilities would be located in the general vicinity of an existing ASR facility operated jointly by CAW and MPWMD. A PEA has been completed and submitted to CPUC, which is preparing to complete an EIR under CEQA.

North Monterey County Desalination Project

The North Monterey County Desalination Project (NMCDP), as currently described by the proponents, is a “merchant” water supply project sponsored by the Pajaro/Sunny Mesa Community Services District (P/SM). Major components of the NMCDP proposal are a seawater desalination plant in Moss Landing and a potential 30-acre solar energy power production facility to reduce energy costs. The proposed desalination facility site is the former National Refractories and Minerals plant, with planned use of the existing intake/outfall pipelines.

The yield goal is 20,000–30,000 AFY, depending on demand. A primary goal is to meet current and future needs of the expanding P/SM service area in northern Monterey County (possibly up to 5,000 AFY). The project is proposed to meet the current and future needs of communities from Moss Landing to the Monterey Peninsula. The P/SM Board has authorized creation of a Joint Powers Authority (JPA) with MPWMD, and is exploring partnerships with other public entities. However, no engineering or environmental documents were publicly available for the verification of the proposed facilities and operation of this proposed project. Also, this project was not awarded its Proposition 50 grant funding for Pilot Testing, and it is unknown if P/SM has other sources of funding available to proceed with its project.

Seaside Basin Groundwater Replenishment Project and Phase 1 Aquifer Storage and Recovery

The feasibility of this project continues to be studied by the MPWMD and others. The project would involve diversion of excess flows (as defined by the SWRCB) from the

Carmel River during winter high-flow periods, and the subsequent injection of the water into the Seaside aquifer for later recovery during the dry season. The CAW water distribution system may need to be expanded, depending on the ultimate scope of the project. If the project serves to supplement existing facilities and reduce reliance on summer diversions, then no expansion may be necessary, although improvements such as increasing pipeline size and treatment may be undertaken.

The environmental effects of Phase 1 of the MPWMD ASR Project have been analyzed in an EIR/EA certified by the MPWMD Board in August 2006. The Phase 1 project entails a second injection well at the MPWMD's existing Santa Margarita Test Injection well site on the former Fort Ord, using existing and planned CAW facilities. Subsequent phases would be the subject of separate future environmental review, and would depend on the progress of other regional water supply projects described in this chapter. The DEIR/EA concluded that the well and pipeline portion of the project would have relatively minor construction impacts; operation of the project would have beneficial effects on the Carmel River hydrology and dependent fish and wildlife. CAW distribution system modifications, if needed, would occur primarily in the Seaside area and upland hills. This project could offset any cumulative impacts to the Carmel River environment, depending on its ultimate configuration and operation. No additional mitigation measures for cumulative impacts are likely to be needed as a result of this project, but until the project is more fully developed, this cannot be certain.

Marina Coast Water District Regional Urban Water Augmentation Project Seawater Desalination

Marina Coast Water District (MCWD) has a small seawater desalination plant, located at its former wastewater treatment plant site on Reservation Road between Dunes Drive and the Monterey Bay. The plant, which is not currently in operation, was built in 1997 and utilizes a single-pass, reverse osmosis (RO) system with a production design capacity of 300 AFY. A seawater collection well is located on the beach west of the State Parks Department parking lot. Reject brine is disposed of in an injection well to the shallow dune aquifer. The brine migrates downgradient toward the ocean and is diluted by groundwater, and wave and tidal action.

Under the MCWD Regional Urban Water Augmentation Project, the project was developed by MCWD as a means of meeting the water augmentation requirements identified in the Base Reuse Plan and accompanying EIR for the former Fort Ord. Its principal objective is the production of 2,400 AFY for use in the Ord community.

MPWMD Sand City Desalination Plant

The MPWMD proposed the construction of a desalination plant in Sand City with a production capability of 8,400 AFY. The desalination plant would use the RO process to remove salts from seawater. This process is about 50 percent efficient; therefore, the desalination plant would require 15 million gallons per day (mgd) of feedwater to

produce 7.5 mgd of potable water. At the same time, the plant would produce about 7.5 mgd of brine concentrate that would be returned to the ocean.

An administrative draft EIR was prepared by MPWMD and reviewed by its Board in December 2003. At that time, completion of a public DEIR was delayed until additional studies on seawater intake and brine discharge technology could be completed. In March 2004, the MPWMD Board determined that it would not pursue the desalination project, pending review of regional desalination projects in Moss Landing that had been proposed. Currently, MPWMD is not actively pursuing the project.

City of Sand City — Sand City Water Supply Project

This project would supply potable water to customers in Sand City at a rate of up to 300 AFY. The proposed design of the desalination system is similar in concept to a system currently operating in the City of Marina, approximately four miles northeast of the project area. This project would replace the existing CAW supplies (currently 135 AFY) and provide treatment and use of up to an additional 165 AFY.

The Sand City Water Supply Project consists of the construction and operation of an RO desalination facility and improvements to the potable water distribution system to serve existing and future residents and commercial/industrial uses in Sand City. Water would be extracted from the shallow, unconfined brackish water aquifer near Monterey Bay and treated to remove salts. This project also includes the installation of approximately 7,000 linear feet of 8 to 12 inch diameter water mains to improve fire flows in the City once the existing water distribution system is disconnected from the CAW water supply system.

Carmel River Watershed Assessment and Action Plan

With a grant from the SWRCB, the Carmel River Watershed Conservancy (CRWC) conducted a watershed assessment and developed an action plan for the Carmel River Watershed in 2004. The purpose of the assessment was to provide a Carmel River Watershed Management Plan in which specific water quality goals would be defined through the planning process and implementation of management measures to achieve these goals would occur. The assessment describes and documents all of the CRWC's concerns in the watershed and those areas where problems exist. Eight action categories were identified, including flows, groundwater, habitat, sedimentation, steelhead, education, public safety, and water quality. The plan makes specific reference to SCD and its effects on sediment transport, fish habitat and fish migration. The Proponent's Proposed Project and other action alternatives considered in this EIR/EIS are consistent with the objectives of the plan, which expresses a desire to upgrade or remove the Dam.

Implementation of the plan's actions is uncertain. Parts of the plan (e.g., those actions affecting water supply or lagoon management) are being undertaken by MPWMD and are incorporated in the IRWMP described above. According to the MPWMD, the CRWC

is implementing the plan through partnerships (Larry Hampson, pers. comm. September 21, 2005). Although an environmental assessment of the plan is not available, the intent of the plan is to improve the Carmel River watershed environment, and actions taken under the plan probably would be beneficial and cumulatively offsetting to any incremental impacts from the San Clemente Dam Seismic Safety Project action alternatives. Beneficial impacts would require no additional mitigation for cumulative impacts. This plan is not addressed further in this EIR/EIS.

Carmel River Lagoon (Sand Bar) Management Plan

This plan, released in April 2007, addresses how and when breaching of the Carmel River Lagoon would be permitted. Breaching currently occurs under emergency permits. California State Parks is the agency leading the development of the plan, and several other agencies are involved, including NMFS, Monterey County, CDFG, MPWMD, homeowners, and other interested parties. This plan would have a beneficial impact on lagoon management. While the SCD Seismic Safety Project alternatives do not have an effect on the lagoon, in the past, the lack of bedload migration downstream of the Dam may has contributed to a lower volume of sand at the river mouth. The need for a Lagoon Management Plan may be a result of sediment deprivation. Under all project alternatives most, if not all, of the sediment reaching the Dam will no longer be held back by the Dam. This plan would require no additional mitigation for cumulative impacts, and is not addressed further in this EIR/EIS.

Growth within the Region

General growth within the region is included in the baseline (No Project Alternative). The need for the Proponent's Proposed Project is to comply with DSOD requirements to improve the structure's ability to pass the Probable Maximum Flood and withstand the Maximum Credible Earthquake. It is not a water supply project and would not be expected to affect development conditions within the MPWMD boundaries or the CAW service area. No additional analysis of urban development is included in this EIR/EIS.

5.3.4 CUMULATIVE ASSESSMENT OF SIGNIFICANT ENVIRONMENTAL IMPACTS

This section provides an assessment of the cumulative impacts of the proposed San Clemente Dam Seismic Safety Project alternatives together with impacts of RFFAs in the region. Table 5.3-1 shows the candidate RFFAs arrayed against the environmental resources areas evaluated in Chapter 4 for the San Clemente Dam Seismic Safety Project.

Geology and Soils

There may be potential for cumulative impacts due to erosion during the construction period of RFFAs. Sediment would typically move quickly to low gradient sections of the river, where it could be retained for significant periods of time, depending on flow. If

sediment contributed by RFFAs and roads accumulates in low gradient areas, this could have a multi-year impact on spawning.

This would be cumulatively considerable. The importance of the impact would depend on the overlap of construction projects in time and their proximity in space. However, even if projects are in close proximity and have overlapping construction times, standard erosion controls as discussed in sections 4.2 and 4.3 would be expected to implemented on most projects to mitigate effects such that there would not be a significant adverse cumulative increase in erosion within the watershed.

In terms of seismic stability, no significant adverse cumulative impacts would occur, and any seismic risks would be reduced as the SCD is strengthened, notched, or removed. No additional mitigation would be required for geology or seismicity.

Hydrology, Water Quality, and Sedimentation

The Proponent's Proposed Project and the action alternatives would have temporary adverse effects on water quality (suspended sediment and turbidity), lasting for the duration of construction. As discussed in sections 4.2 (Hydrology) and 4.3 (Water Quality), these construction impacts would be mitigated to a less than significant level to satisfy federal and state permitting requirements. Similar conditions would be required for other construction projects potentially affecting water quality, such that there would not be a significant adverse cumulative increase in erosion within the watershed.

Implementation of any of the San Clemente Dam Seismic Safety Project action alternatives would either restore natural basin hydrology below SCD (dam removal under Alternatives 2 or 3) or would have minimal effect on the existing operational flow releases from SCD (Proponent's Proposed Project, Alternative 1). The No Project Alternative (Alternative 4) would continue existing "interim" drawdown and flow releases. No cumulatively significant impacts on the hydrology of the Carmel River system would occur and no additional mitigation is necessary.

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Table 5.3-1: Summary of Potential for Cumulative Impacts from Reasonably Foreseeable Future Actions (San Clemente Dam Seismic Safety Project)

Reasonably Foreseeable Future Actions	Geology and Soils	Air Quality	Noise	Hydrology & Sediment	Water Quality	Aquatic Biology & Fish	Terrestrial Biology	Wetlands	Traffic & Circulation	Cultural Resources	Visual Quality
Monterey County General Plan Update	Eliminated from consideration for cumulative impacts: the Plan's guidance for growth is incorporated in 2030 baseline for environmental evaluation;										
Monterey Park Management Plan	Eliminated from consideration for cumulative impacts: no adverse cumulative effects identified										
Carmel Valley Master Plan	*Plan unlikely to affect geological features affected by project*	*Potential beneficial (offsetting) impact due to Plan policies addressing traffic*	*No cumulative effects on noise levels for sensitive receptors within the area affected by the project*	*Plan unlikely to affect hydrology or sediment transport in Carmel River reaches affected by project*	*Plan unlikely to have cumulative adverse effects on water quality parameters affected by project*	*Plan unlikely to have cumulative adverse effects on aquatic habitat or species affected by project*	*Plan unlikely to have cumulative adverse effects on terrestrial habitat or species within the area affected by the project*	*Plan unlikely to have cumulatively adverse effects on wetlands within the area affected by the project*	*Potential beneficial (offsetting) impact due to Plan policies addressing traffic*	*Plan unlikely to affect cultural resources in the APE*	*Plan unlikely to affect visual quality in viewsheds affected by the project*
Monterey County Development Projects: Rancho San Carlos Partnership	*Eliminated from further analysis because it has been inactive for more than two years and does not appear to be a RFFA. This project would occur in an existing developed area. The infrastructure is in, the only things that are being constructed would be the private homes and all of those sites have already been purchased.*										
Monterey County Development Projects: Carmel Valley Recreation and Parks Museum	*Eliminated from consideration for cumulative impacts: project occurs in existing developed area, with local effects unlikely to overlap geographically with the areas of effect of the project.*										
Monterey County Development Projects: Garland Ranch Regional Park Addition	*Eliminated from consideration for cumulative impacts: project completed and included in baseline for environmental evaluation*										
Monterey County Development Projects: White Oak Plaza	*Project occurs in existing developed area, with local effects unlikely to overlap geographically with the areas of effect of the project.*	*Could add incremental effect to regional air quality*	*Project occurs in existing developed area, with local effects unlikely to overlap geographically with the areas of effect of the project.*	*Project occurs in existing developed area, with local effects unlikely to overlap geographically with the areas of effect of the project.*	*Project occurs in existing developed area, with local effects unlikely to overlap geographically with the areas of effect of the project.*	*Project occurs in existing developed area, with local effects unlikely to overlap geographically with the areas of effect of the project.*	*Project occurs in existing developed area, with local effects unlikely to overlap geographically with the areas of effect of the project.*	*Project occurs in existing developed area, with local effects unlikely to overlap geographically with the areas of effect of the project.*	*Could add incremental effect to regional circulation*	*Project occurs in existing developed area, with local effects unlikely to overlap geographically with the areas of effect of the project.*	*Project occurs in existing developed area, with local effects unlikely to overlap geographically with the areas of effect of the project.*
Monterey County Development Projects: Rancho Cañada Village	*No potential impact: project features do not overlap geographically.*	*Consider Potential beneficial (offsetting) impact due to closure of golf course and traffic reduction No cumulative effect.*	*No cumulative effects on noise levels for sensitive receptors within the area affected by the project*	*Potential beneficial (offsetting) impact to hydrology due to water savings*	*Potential beneficial (offsetting) impact to water quality due to project mitigation and enhancement features*	*Potential beneficial (offsetting) impact due to project enhancement of steelhead habitat*	*Potential beneficial (offsetting) impact due to project enhancement of riparian habitat*	*Project unlikely to have cumulatively adverse effects on wetlands within the area affected by the project*	*Potential beneficial (offsetting) impact due to closure of golf course and traffic reduction*	*Project unlikely to have cumulatively adverse effects on San Clemente Dam Historic District*	*Project unlikely to affect visual quality in viewsheds affected by the project*
Monterey Integrated Regional Water Management Plan (incorporates the MPWMD Carmel River Management Program and the Carmel River Watershed Assessment and Action Plan)	*Plan unlikely to affect geological features affected by project*	*Plan unlikely to affect air quality affected by the project.*	*No cumulative effects on noise levels for sensitive receptors within the area affected by the project*	*Potential beneficial (offsetting) impact to hydrology and sediment*	*Potential beneficial (offsetting) impact to water quality*	*Potential beneficial (offsetting) impact to aquatic biology and fish*	*Potential beneficial (offsetting) impact to riparian systems*	*Potential beneficial (offsetting) impact to wetlands*	*Plan unlikely to have cumulatively adverse effects on traffic patterns at times and locations affected by the project*	*Plan unlikely to have cumulatively adverse effects on San Clemente Dam Historic District*	*Plan unlikely to affect visual quality in viewsheds affected by the project*
Regional Water Supply Projects Coastal Water Project	*No potential impact: project features do not overlap geographically.*	*Could add incremental effect to regional air quality*	*No cumulative effects on noise levels for sensitive receptors within the area affected by the project*	*Potential beneficial (offsetting) impact due to reduced pumping from wells*	*Potential beneficial (offsetting) impact due to reduced pumping from wells*	*Potential beneficial (offsetting) impact due to reduced pumping from wells*	*Project unlikely to have cumulative adverse effects on terrestrial habitat or species within the area affected by the project*	*Project unlikely to have cumulatively adverse effects on wetlands within the area affected by the project*	*Project unlikely to have cumulatively adverse effects on traffic patterns at times and locations affected by the project*	*Project unlikely to have cumulatively adverse effects on San Clemente Dam Historic District*	*Project unlikely to affect visual quality in viewsheds affected by the project*
Regional Water Supply Projects	*No potential impact:*	*Could add*	*No cumulative effects*	*Potential beneficial*	*Potential beneficial*	*Potential beneficial*	*Project unlikely to*	*Project unlikely to*	*Project unlikely to*	*Project unlikely to*	*Project unlikely to*

Table 5.3-1: Summary of Potential for Cumulative Impacts from Reasonably Foreseeable Future Actions (San Clemente Dam Seismic Safety Project)

Reasonably Foreseeable Future Actions	Geology and Soils	Air Quality	Noise	Hydrology & Sediment	Water Quality	Aquatic Biology & Fish	Terrestrial Biology	Wetlands	Traffic & Circulation	Cultural Resources	Visual Quality
North Monterey Desalinization	*project features do not overlap geographically.*	*incremental effect to regional air quality*	*on noise levels for sensitive receptors within the area affected by the project*	*(offsetting) impact if project serves CAW customers and reduces pumping*	*(offsetting) impact if project serves CAW customers and reduces pumping*	*(offsetting) impact if project serves CAW customers and reduces pumping*	*have cumulative adverse effects on terrestrial habitat or species within the area affected by the project*	*have cumulatively adverse effects on wetlands within the area affected by the project*	*have cumulatively adverse effects on traffic patterns at times and locations affected by the project*	*have cumulatively adverse effects on San Clemente Dam Historic District*	*affect visual quality in viewsheds affected by the project*
Regional Water Supply Projects Sand City Desalinization	*No potential impact: project features do not overlap geographically.*	*Could add incremental effect to regional air quality*	*No cumulative effects on noise levels for sensitive receptors within the area affected by the project*	*Potential beneficial (offsetting) impact if project serves CAW customers and reduces pumping*	*Potential beneficial (offsetting) impact if project serves CAW customers and reduces pumping*	*Potential beneficial (offsetting) impact if project serves CAW customers and reduces pumping*	*Project unlikely to have cumulative adverse effects on terrestrial habitat or species within the area affected by the project*	*Project unlikely to have cumulatively adverse effects on wetlands within the area affected by the project*	*Project unlikely to have cumulatively adverse effects on traffic patterns at times and locations affected by the project*	*Project unlikely to have cumulatively adverse effects on San Clemente Dam Historic District*	*Project unlikely to affect visual quality in viewsheds affected by the project*
Regional Water Supply Projects Phase 1 ASR	*No potential impact: project features do not overlap geographically.*	*Could add incremental effect to regional air quality*	*No cumulative effects on noise levels for sensitive receptors within the area affected by the project*	*Potential beneficial (offsetting) impact if project serves CAW customers and reduces pumping*	*Potential beneficial (offsetting) impact if project serves CAW customers and reduces pumping*	*Potential beneficial (offsetting) impact if project serves CAW customers and reduces pumping*	*Project unlikely to have cumulative adverse effects on terrestrial habitat or species within the area affected by the project*	*Project unlikely to have cumulatively adverse effects on wetlands within the area affected by the project*	*Project unlikely to have cumulatively adverse effects on traffic patterns at times and locations affected by the project*	*Project unlikely to have cumulatively adverse effects on San Clemente Dam Historic District*	*Project unlikely to affect visual quality in viewsheds affected by the project*
Regional Water Supply Projects Regional Urban Water Augmentation	*No potential impact: project features do not overlap geographically.*	*Could add incremental effect to regional air quality*	*No cumulative effects on noise levels for sensitive receptors within the area affected by the project*	*Potential beneficial (offsetting) impact if project serves CAW customers and reduces pumping*	*Potential beneficial (offsetting) impact if project serves CAW customers and reduces pumping*	*Potential beneficial (offsetting) impact if project serves CAW customers and reduces pumping*	*Project unlikely to have cumulative adverse effects on terrestrial habitat or species within the area affected by the project*	*Project unlikely to have cumulatively adverse effects on wetlands within the area affected by the project*	*Project unlikely to have cumulatively adverse effects on traffic patterns at times and locations affected by the project*	*Project unlikely to have cumulatively adverse effects on San Clemente Dam Historic District*	*Project unlikely to affect visual quality in viewsheds affected by the project*
Regional Water Supply Projects Seaside Basin Groundwater Replenishment	*No potential impact: project features do not overlap geographically.*	*Could add incremental effect to regional air quality*	*No cumulative effects on noise levels for sensitive receptors within the area affected by the project*	*Potential cumulative impact from winter diversions from the Carmel River*	*Potential cumulative impact from winter diversions from the Carmel River*	*Potential cumulative impact from winter diversions from the Carmel River*	*Project unlikely to have cumulative adverse effects on terrestrial habitat or species within the area affected by the project*	*Project unlikely to have cumulatively adverse effects on wetlands within the area affected by the project*	*Project unlikely to have cumulatively adverse effects on traffic patterns at times and locations affected by the project*	*Project unlikely to have cumulatively adverse effects on San Clemente Dam Historic District*	*Project unlikely to affect visual quality in viewsheds affected by the project*
Carmel River Lagoon (Sand Bar) Management Plan	*Plan unlikely to affect geological features affected by project*	*No cumulative effect.*	*No cumulative effects on noise levels for sensitive receptors within the area affected by the project*	*Potential beneficial (offsetting) impact to hydrology and sediment impacts in the Carmel Lagoon*	*Potential beneficial (offsetting) impact to water quality in the Carmel Lagoon*	*Potential beneficial (offsetting) impact to aquatic biology and fish in the Carmel Lagoon*	*Plan unlikely to have cumulative adverse effects on terrestrial habitat or species within the area affected by the project*	*Potential beneficial (offsetting) impact to wetlands in the Carmel Lagoon*	*Plan unlikely to have cumulatively adverse effects on traffic patterns at times and locations affected by the project*	*Plan unlikely to have cumulatively adverse effects on San Clemente Dam Historic District*	*Plan unlikely to affect visual quality in viewsheds affected by the project*
Regional Growth	*Eliminated from consideration for cumulative impacts: included in 2030 baseline for environmental evaluation*										

Under the Proponent's Proposed Project, Dam Notching (Alternative 1), and No Project (Alternative 4), natural sediment loads delivered to San Clemente Reservoir would begin to pass downstream by about 2010 to 2015. Under Alternative 1, these loads would begin to pass soon after construction was completed. Under Alternatives 2 and 3, these releases could be increased in the short-term by additional sediments mobilized from restored stream channels upstream of SCD, and from the reestablishment of stream channels traversing the newly excavated sediment mass behind the Dam (Alternative 1). In addition, sluicing operations to maintain fish passage in the new fish ladder for Proponent Proposed Project and Alternative 1 could discharge up to 2.4 AF of sediment downstream of the Dam over a two-hour time period. Operation of sluice gates would likely occur once or twice a year over the life of the Dam.

The reintroduction of sediment to the lower Carmel River could have cumulative effects with other sediment sources to improve or degrade aquatic habitat. Currently, several reaches of the Carmel River are degrading due to the lack of sediment. This lack of sediment led the channel to erode and down-cut. Reintroducing a sediment supply to the lower reaches of the Carmel River will slow the channel erosion process, and may slowly bring the channel back to equilibrium. The addition of coarse sediment also will decrease the channel bed armoring process that is occurring in the reach downstream of the Dam. The approximately three mile reach between the Dam and Tularcitos Creek is armored with little or no gravel or sand. Restoring sediment in these size ranges would improve the riparian zone and steelhead spawning habitat (although it could initially reduce rearing habitat as interstitial spaces fill).

Most of the RFFAs identified would have beneficial effects on the stream channel and habitat of the lower Carmel River, which could offset any cumulative adverse effects that may occur. Proposed mitigation or enhancement measures for the action alternatives would be adequate to mitigate any potentially significant cumulative impacts on sediment transport and no additional mitigation of cumulative impacts is needed.

Fish and Aquatic Life

Several of the Regional Water Supply Projects include components that could reduce water demand from the Carmel River and help to augment dry season flows through the Carmel Valley. The Coastal Water Project, Sand City Desalinization, Phase 1 ASR, Seaside Basin Groundwater Replenishment and the Regional Urban Water Augmentation are expected to be online within 10 years. These projects provide for alternative water supplies (desalinization) and conjunctive use of groundwater storage facilities, surface water supplied from the Carmel River and water provided from desalination facilities to provide water to the Monterey Peninsula. Such projects would likely reduce summer water demand from CAW's production wells in the lower Carmel River and improve the amount and habitat quality for rearing juvenile steelhead. One concept would use a winter diversion from SCD or wells along the valley that would be stored as groundwater and then used during the low flow season. A winter diversion would need to be adequately screened and bypass flows established to protect

steelhead, but in most years during winter, there is enough water in the river to support diverting some of the water without harming the river.

Two comprehensive management plans will also help to improve habitat conditions in the Carmel River and include the Monterey Integrated Regional Water Management Plan (incorporating the preceding MPWMD Carmel River Management Program). The Integrated Regional Water Management Plan addresses water use in the Carmel Valley and will potentially be beneficial to flows in the Carmel River. The MPWMD's Carmel River Management Program addresses habitat restoration work for steelhead and would potentially be beneficial to habitat conditions in the river. The Carmel River Lagoon (Sand Bar) Management Plan addresses habitat conditions in the Carmel River lagoon by managing the sand bar at the mouth. This plan would potentially improve habitat conditions in the lagoon which in some years provides important rearing habitat for juvenile steelhead.

Continued population growth in the area and the increase in the number and continued use of private wells sunk into the Carmel Valley aquifer may offset some of the gains to lower Carmel River habitat. Improved SCD fish passage facilities or dam removal would provide better access to upstream habitat for steelhead, potentially offsetting any potential significant adverse cumulative effects of the RFFAs on resources that may be affected by the action alternatives.

Vegetation and Wildlife

The effects of Proponent's Proposed Project and its alternatives on vegetation and wildlife would be geographically separated from those of other RFFAs, largely confined to the Project Area and access routes. No cumulative significant adverse impacts would occur and no additional mitigation measures are necessary.

Traffic

The Proponent's Proposed Project and its alternatives would result in a temporary increase in traffic levels, largely in the immediate Project Area and along access routes. These effects are expected to be largely separated in space and time from the traffic effects of other RFFAs. The existence of a significant cumulative impact caused by other projects does not mean that the incremental effects of the Proponent's Proposed Project are considerable (CEQA Guidelines, Sections 15064 and 15130). Currently some of the roads that would be used by the project alternatives and other RFFAs are at maximum capacity or may need improvements to handle projected traffic. It is possible that there could be a cumulative adverse impact on traffic. With the traffic mitigation measures contained in this EIR/EIS the contribution of the project alternatives to traffic impacts are less than significant. Similar conditions would be required for other construction projects which might mitigate impacts to traffic such that there would not be a significant adverse cumulative increase in traffic within the area

Air Quality

The action alternatives would have temporary adverse effects on air quality as a result of project construction activities. Generally these effects would be localized in the Project Area. The General Conformity Determination for the project alternatives found that emissions of nitrogen oxide (NO_X), reactive organic compound (ROC) and particulate matter of less than 10 microns (PM_{10}) would not interfere with attainment or maintenance or cause or contribute to an exceedance of the National Ambient Air Quality Standards (NAAQS) under the Clean Air Act (CAA) (see Appendix Y). The purpose of the general conformity review is to ensure that federal actions do not interfere with the emissions budgets in the California State Implementation Plan. These budgets consider cumulative effects.

Construction activities would generate temporary emissions from diesel-powered equipment and road dust. Fugitive dust, if not mitigated, could exceed the MBUAPCD construction threshold of significance for PM_{10}. In addition, estimated daily emissions from fuel combustion at the Dam and sediment handling could exceed the 137 pound per day level of significance for NO_X set by MBUAPCD. While the modeled concentration of NO_X, when added to the maximum recent historic background concentration, does not exceed an applicable standard, the MBUBAPCD has expressed concerns regarding the incremental addition of NO_X to regional air quality levels in an air basin that is non-attainment for the State ozone standard, To the extent that PM_{10} and No_X emissions by the project alternatives and RFFAs contribute to a regional incremental increase of NO_X, there could be a potential significant environmental impact on ambient air quality from project activities.

No additional mitigation measures beyond those in Section 4.7 have been identified.

Climate Change and Greenhouse Gas Emissions

The Global Warming Solutions Act of 2006 (AB 32) codifies California's goal of reducing statewide emissions of greenhouse gases (GHG) to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on global warming emissions that will be phased in starting in 2012 to achieve maximum technologically feasible and cost-effective GHG emission reductions. In order to effectively implement the cap, AB 32 directs the California Air Resources Board (CARB) to develop appropriate regulations and establish a mandatory reporting system to track and monitor global warming emissions levels.

As of the publication of this report, no rules or regulations have been promulgated by CARB or by any other state agency which defines a "significant" source of GHG emissions. In addition, there are no applicable facility-specific emission limitations or caps for GHG emissions, either statewide or at the local air district level. Thus, there is no regulatory or guidance mechanism for determining whether a project advances or hinders the GHG reduction goals of AB 32 (2006) and no standards of significance for GHG impacts have been established under CEQA. SB 97 (2007) requires the California

State Office of Planning and Research to prepare "guidelines for the mitigation of GHG emissions or the effects of GHG emissions" which will, in turn, be required by CEQA by July 2009, and certified and adopted by the Resources Agency by January 2010. Since the San Clemente Dam Seismic Safety Project was initiated under CEQA in 2005, and prior to the enactment of AB 32, the initial air quality impact evaluation for this project did not quantify GHG emissions, as discussed below.

Common GHGs include water vapor (H_2O), carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), chlorofluorocarbons (CFC), hydrofluorocarbons (HFC), perfluorocarbons, sulfur hexafluoride (SF_6), ozone (O_3) , and aerosols. GHG are emitted by both natural processes and human activities. The accumulation of GHG in the atmosphere can increase the earth's temperature over time. GHG emissions from human activities, such as fossil-fueled generation of electricity and vehicle use, have elevated the concentration of these gases in the atmosphere, thus causing global warming (Association of Environmental Professionals [AEP] 2007). The principal GHG that enter the atmosphere because of human activities are:

- Carbon dioxide: CO_2 enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). CO_2 also is removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.

- Methane: CH_4 is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills. For the Proponent's Proposed Project and the other action alternatives, methane is a very minor component of diesel GHG emissions, typically less than 0.05 percent[1].

- Nitrous oxide: N_2O is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste. Nitrous oxide comprises a small fraction of oxides of nitrogen (NO_X) emissions from combustion sources which are mainly nitric oxide (NO) and nitrogen dioxide (NO_2)[2].

- Fluorinated gases: Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful GHGs that are emitted from a variety of industrial processes. Fluorinated gases are often used as substitutes for ozone-depleting substances (i.e., CFCs, HCFCs, and halons). These gases typically are emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as High Global Warming Potential gases ("High GWP gases") EPA 2006b).

[1] "Compilation of Air Pollution Emission Factors (AP-42), Fifth Edition", EPA 1995 Tables 3.3-1 and 3.4-1

[2] NO_X from high-temperature sources is about 85 to 90 percent NO, about 9-14% NO_2, and less than 1 percent N_2O.

The GHG of most concern is CO_2 since it is released by the burning of fossil fuels (coal, oil, gas), can last in the atmosphere for centuries, and "forces" more climate change than any other GHG. In 2004, CO_2 accounted for 85 percent of the GHG emissions produced in the United States, and electrical generation accounted for 40 percent of those CO_2 emissions. In 2004, approximately 2.5 billion short tons of CO_2 were produced in the United States from electrical generation[3]. Therefore, approximately 6.3 billion short tons of CO_2 were emitted in the United States in 2004 from all sources. The California Energy Commission (CEC) has estimated that in 2004, the state emitted 542 million short tons of CO_2 equivalent GHG emissions (CEC 2006 Report), which is about 8.6 percent of the national total.

According to the AEP, there are currently no published thresholds or recommended methodologies for determining the significance of a project's potential cumulative contribution to global climate change (GCC) in CEQA documents. Even a very large individual project cannot generate enough GHG emissions to influence global climate change by itself. However, the effects of GHG have been cumulatively determined to have led to climate change on a global scale, which would be a significant cumulative effect. A project participates in this potential impact by its incremental contribution combined with the cumulative increase of all other sources of GHGs, which, when taken together, form global climate change impacts (AEP 2007). While short-term and temporary, this project could incrementally increase this significant cumulative impact, depending upon the source(s) of energy used in implementing the project.

The Proponent's Proposed Project would contribute to GHGs primarily through the use of diesel-powered construction equipment. Construction activities would be intermittent and would be completed after two to three construction seasons. There would be no long-term emissions (permanent sources) of GHGs from the Proponent's Proposed Project. Emissions associated with project-generated traffic would vary relatively little among the project alternatives. These small differences in emissions would have negligible effect on comparative and temporal ambient air quality impacts. Project impact assessment and mitigation described in Section 4.7 Air Quality, is based on a standard set of project traffic-related emissions measurements developed for to evaluate emissions effects from the Proponent's Proposed Project and all the project alternatives.

The combustion of diesel fuel in off road construction equipment and on road vehicles (trucks, etc.) would emit GHGs consisting mainly of carbon dioxide (CO_2), along with small amounts of methane (CH_4) and nitrous oxide (N_2O)[4]. Since emission factors for carbon dioxide are published by the EPA for diesel fuel combustion, GHG emissions are estimated for the project alternatives as carbon dioxide[5]. Since methane and nitrous oxide comprise less than 0.1 percent of GHG emissions from diesel fuel combustion,

[3] Electric power generators report carbon dioxide emissions to EPA pursuant to Title 40 CFR Part 75 requirements with reasonable accuracy.
[4] Over 99.9 percent CO_2 , less than 0.1 percent methane and nitrous oxide
[5] AP-42, Tables 3.3-1 and 3.4-1

they can be safely ignored in a screening level analysis such as the one performed for the project alternatives, even with their relatively higher GWP. Estimated carbon dioxide emissions for access road construction and for the project alternatives are shown in Tables 5.3-2 and 5.3-3, respectively.

Table 5.3-2: Estimated Carbon Dioxide Emissions Summary for Access Road Construction

Access Route	CO_2	CO_2
	lb/day	tons/yr
San Clemente Drive (all project alternatives)	107	5.3
Tularcitos (Proponent's Proposed Project only)	101	5.1

Table 5.3-3: Estimated Carbon Dioxide Emissions Summary for Construction of Project Alternatives

Activity Area	CO_2	CO_2
	lb/day	tons/yr
Site 4R (Alternatives 1, 2)	3,925	196
Dam Site (All project alternatives)	9,147	457

The project CO_2 emissions shown in Tables 5.3-2 and 5.3-3 above were estimated by computing and applying the ratio of CO_2 and sulfur dioxide (SO_2) emission factors, which are both fixed mass based factors (i.e., they are unaffected by variables such as temperature). The reference AP-42 factor for CO_2 is 164 pounds per million British Thermal Units (lb/mmBTU) and the SO_2 factor for California ultra-low sulfur (15 ppmw) diesel fuel is 1.55 x 10-3 lb/mmBTU. Thus, the SO_2 / CO_2 ratio is 9.5 x 10-6. Since SO_2 emissions were calculated for the initial 2005 CEQA analysis, estimated CO_2 emissions were obtained by dividing SO_2 emissions for each alternative by 9.5×10^6. This approach avoided the need to modify the entire emission calculation template for the project alternatives.

Notwithstanding the small amount of N_2O emissions relative to NO and NO_2, project applicants will discuss potential practical and cost effective NO_X controls for diesel vehicles and equipment, such as Viscon, (which could reduce NO_X emissions up to 25 percent) with the Monterey Bay Unified Air Pollution Control District (MBUAPCD) during project permitting. In addition, the project would comply with the following:

- Vehicle climate change standards: Assembly Bill (AB) 1493 (Pavley) required the state to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of climate change emissions emitted by passenger vehicles and light duty trucks. Regulations were adopted by CARB in September 2004.

- Heavy duty vehicle emission reduction measures: Increased efficiency in the design of heavy duty vehicles and an education program for the heavy duty vehicle sector. Vehicles accessing the project site are required to comply with emissions standards enforced by CARB.

- Diesel anti-idling: In July 2004, the CARB adopted a measure to limit diesel fueled commercial motor vehicle idling in order to cut emissions of diesel particulate matter (DPM). This measure also reduces GHG emissions.

While the activities of this project, by themselves, would not appear to be significant in their contribution to global GHG levels, the emissions from these activities may contribute to a cumulatively significant effect. Even with the mitigation discussed above, the emissions from this project when added to the emissions from other past, present, and probable future projects in the state would contribute to the increase in GHGs that are contributing to global climate change.

The California State Legislature has determined that global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California (Health and Safety Code Section 38501). Until further standards are set regarding impacts, the cumulative effect of increased GHG emissions would be a potential significant effect on the environment. Out of an abundance of caution, this EIR/EIS will regard any net contribution of GHG emissions to the air to be a potential significant cumulative effect of the project.

In the absence of established GHG thresholds, it is difficult to make conclusions about the magnitude of the impact and what are appropriate mitigation measures. CEQA recognizes that there are instances where appropriate mitigation for certain cumulative impacts involves the adoption of ordinances, guidelines, regulations, or other similar measures rather than the imposition of conditions on a project-by-project basis. There is recent state legislation which requires the setting of guidelines and standards on the effects and mitigation of GHG emissions by 2010; since these standards are not yet in effect, compliance with standards cannot be a mitigation strategy. Given the lack of standards at this time, and the fact that there are questions regarding specific mitigation actions, including possible GHG mitigation banking programs, there is considerable uncertainty regarding appropriate project specific mitigation for GHG emissions for projects of this kind. The action alternatives may contribute a relatively small, short-term contribution to GHG emissions. As of the publication of this report, no additional mitigation measures beyond those set forth in Section 4.7 on air quality have been identified.

Noise

The project alternatives would have temporary adverse effects on noise as a result of project construction activities. These effects would be localized in the Project Area and separated from the effects of other RFFAs. No cumulative significant impacts would occur and no additional mitigation measures are necessary.

Aesthetics

The visual impacts of the project alternatives would be limited to the viewsheds in the Project Vicinity and would not contribute to a cumulative decline in visual quality outside

of the Project Area. The project is located outside of any public viewing area, and post-project views will be very similar to pre-project conditions. Project alternatives would have temporary adverse aesthetic effects in the Project Area as a result of project construction activities. These effects would be localized in the Project Area and separated from the effects of other RFFAs. No cumulative significant impacts would occur and no additional mitigation measures are necessary.

Cultural Resources

The projects described in Table 5.1-1 could contribute to a cumulative loss of cultural resources in the Carmel Valley. The proposed mitigation measures reduce the potential adverse effects on cultural resources in the vicinity of SCD to less than significant levels. In addition, an additional mitigation measure has been proposed to address site CA-MNT-33, as described below.

There presently exists a highly significant site (CA-MNT-33) (comprising two large midden areas) that has been subjected to a wide range of impacts from past and present activities in the vicinity of the CVFP. Although the direct impacts from the Proponent's Proposed Project would be mitigated to a less than significant level, these impacts would contribute to a cumulative loss of cultural resources at siqIn order to avoid this cumulative impact, a management plan should be developed that would assist the applicant in protecting the site. This plan should define the boundaries of the site, indicate where intact and significant deposits are likely to be preserved, define management protocols for protecting the site, and define a standard for assessing the success of the management protocols. The management protocols should include reviewing all ground disturbing activities to avoid impacts on significant buried and surface deposits, removing or re-siting existing facilities or equipment where possible, storing construction materials and equipment offsite, and providing an education program to applicant staff members charged with oversight of the facility to prevent adverse impacts from incidental activities or vandalism. With implementation of the mitigation measures contained in this EIR/EIS and the management plan for resources is *de minimus* and is not cumulatively considerable. No additional mitigation measures could be required or recommended.

Public Health and Safety

The project alternatives benefit public health and safety by avoiding the potential for dam failure during a MCE or PMF. No additional mitigation measures are necessary.

Land Use, Planning, and Recreation

The project alternatives are not anticipated to have an adverse impact on land use, planning or recreation, and would not affect planned land uses. The cumulative impact associated with the project alternatives and other RFFAs is not significant. No additional mitigation measures are necessary.

Conclusions

The existence of a significant cumulative impact caused by other projects does not mean that the incremental effects of the project alternatives are considerable (CEQA Guidelines, Sections 15064 and 15130). The project alternatives' contribution to impacts would be less than cumulatively considerable in combination with other projects and thus not significant with the possible exception of air quality and GHG emissions.

No additional mitigation measures beyond those contained in this EIR/EIS are required to address the incremental contribution of the Proponent's Proposed Project to cumulative impacts. However, it is recommended that a management plan be developed by the applicant to provide protection for a significant cultural resource (CA-MNT-33), located in the vicinity of the CVFP as outlined in the cultural resources discussion above.

5.4 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

An irreversible or irretrievable commitment of resources refers to impacts on or losses to resources that cannot be recovered or reversed. Examples of such impacts would be the extinction of a species or permanent conversion of wetlands to fill. In either case, the loss would be permanent.

The project alternatives would require an irretrievable commitment of natural resources from direct consumption of fossil fuels and construction materials (see Section 5.5). The construction and operation of the San Clemente Dam Seismic Safety Project alternatives could result in the destruction of aquatic or terrestrial life, or the commitment of other resources as described below.

5.4.1 GEOLOGY

Under Alternative 3, the topography of the saddle separating the Carmel River and San Clemente Creek would be irreversibly altered by blasting to create a diversion bypass channel. This is not considered a significant adverse environmental impact.

5.4.2 AQUATIC BIOLOGY

Under the Proponent's Proposed Project, a fish ladder would continue to provide passage upstream, but would not be equivalent to passage in a free flowing stream. Under Alternative 1, a fish ladder would continue to provide passage upstream, but would not be equivalent to passage in a free flowing stream.

Alternative 2 would restore the river to a free-flowing stream. All sediment trapped in the reservoir would be stored at a site upstream of the location of the current reservoir.

Under Alternative 3, about 2,350 feet of Carmel River would be permanently committed to channel sediment storage and dike construction. This portion of the Carmel River would be permanently bypassed by cutting a 450-foot-long channel between the Carmel

River and San Clemente Creek. The bypassed portion of the Carmel River would be used as a sediment disposal site for the accumulated sediment.

5.4.3 VEGETATION AND WILDLIFE

Site 4R would be committed to use for sediment disposal under Alternatives 1 and 2. The site would be filled by up to 2.5 million cubic yards (1,555 AF) of accumulated sediment removed from behind the Dam). The footprint area of the sediment pile would be up to 23 acres. This site is located in a relatively steep, undeveloped, forested ravine approximately 3,500 feet east of San Clemente Reservoir. The ravine supports an ephemeral stream that carries local runoff during storm events. The watershed area tributary to the sediment pile site is approximately 252 acres.

Along access roads that are widened or constructed, terrestrial habitat would be committed to transportation use.

5.4.4 CULTURAL RESOURCES

The alterations that would be made to SCD and OCRD (historic dams) and their associated fish ladders, as well as impacts to the character and visual integrity of associated features of the SCD Historic Resource District represent irreversible commitments of cultural resources.

5.5 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Effects on resources are often characterized with respect to their being of short or long-term duration. This section, highlighting some of the broader relationships between short and long-term effects, is not intended to repeat analyses already provided. Rather, this section presents some of the tradeoffs in the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity of resources. An important consideration when analyzing the effects of a Proponent's Proposed Project or an action alternative is whether it would result in short-term environmental effects (adverse or beneficial) to the detriment of achieving long-term or maximizing productivity of these resources. Short-term refers to the duration of construction of the San Clemente Dam Seismic Safety Project alternatives and long-term refers to an indefinite period following the implementation of the project.

The construction of the Proponent's Proposed Project or action alternatives, including dam retrofit or removal, sediment transport and disposal, and access road improvements would cause minor, localized effects. Most of these would be short-term, although as described above (Section 5.4), sediment disposal would entail long-term commitments of terrestrial or aquatic sites. Where sites or routes are permanently altered, such as the construction of the thickened dam, construction of the new Tularcitos Access Route or sediment storage at Site 4R, long-term commitments of aquatic and/or terrestrial resources would be made.

Long-term environmental gains are expected for anadromous fish using the Carmel River because of improved fish passage. The extent of these gains vary depending on whether passage is provided by improving the fish ladder (Proponent's Proposed Project and Alternative 1) or removing the Dam (Alternatives 2 and 3). Net improvements to fish passage are realized even where the Dam is retained and the fish ladder and SOMP (see Appendix J) are used to maintain fish passage over the Dam and upstream through the sediment delta.

5.6 NATURAL OR DEPLETABLE RESOURCES

The project would consume minor amounts of depletable fossil fuels in transporting construction workers to work sites, excavating sediment, and transporting sediment by truck or conveyor belt to disposal sites. The Proponent's Proposed Project would consume about 10,000 tons of coarse aggregate, 5,000 tons of sand, 24,000 sacks of cement, and 8,000 sacks of fly ash to produce approximately 5,800 cubic yards of concrete for the Dam and 1,400 cubic yards for the fish ladder. The project would not increase the consumption of other natural resources.

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CHAPTER 6.0

LISTS AND REFERENCES

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FINAL Environmental Impact Report /
Environmental Impact Statement

San Clemente Dam Seismic Safety Project

volume 3, Appendices A - G



January 2008



Prepared for

California Department of Water Resources
U.S. Army Corps of Engineers

US Army Corps of Engineers®

SCH 1 #997042007

FINAL

Environmental Impact Report
Environmental Impact Statement

for the

San Clemente Dam Seismic Safety Project

Prepared for

California Department of Water Resources

U.S. Army Corps of Engineers

Volume 3, Appendices A - G

January 2008

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Bob Biacchi

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California Coastal Commission

California Department of Fish and Game

Carmel River Watershed Conservancy

Carmel River Steelhead Association (2 letters)

California Sportfishing Protection Alliance

Carmel Valley Association

Davi, Anthony (individual)

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Fischer, John (individual)

Hillyard, Stepven

Horan, Laurence (Law Offices of Horan, Lloyd, Karachale, Dyer Schwartz, Law & Cook)

Monterey Bay Unified Air Pollution Control District

Monterey Peninsula Regional Park District

Monterey Peninsula Water Management District

National Marine Fisheries Service (NMFS) (2 letters)

Northern California Council of the Federation of Fly Fishers

Planning and Conservation League Foundation

Redgwick, Don (individual, 2 letters)

RisingLeaf Watershed Arts

Rosenberg, Lewis (individual)

Rosenthal, Claude & Bettina (individual)

Santa Cruz Fly Fishermen

Sierra Club Ventana Chapter

Sleepy Hollow Homeowners Association

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Appendix A

NOTICE OF PREPARATION

SEP 28 2005

FILE COPY

Scott Morgan, Senior Planner
Governor's Office of Planning and Research
State Clearing House
1400 Tenth Street
Sacramento, California 95814

Notice of Preparation of a Draft Environmental Impact Report
Project Title: San Clemente Dam Seismic Safety Project
Project Sponsor: Coastal Division of California-American Water
Project Location: Monterey County

NOTICE OF PREPARATION

The Division of Safety of Dams, Department of Water Resources (DWR) is the State Lead Agency for the preparation of the San Clemente Dam Seismic Safety Project Draft Environmental Impact Report/Environmental Impact Statement (DEIR/EIS). The document will be prepared in cooperation with the United States Army Corps of Engineers (USCOE).

DWR issued a Notice of Preparation (NOP) for the Seismic Retrofit of San Clemente Dam EIR (State Clearinghouse No. 1997042007) in March 1997. A draft EIR was circulated for public review. Based on comments, a further evaluation and expanded range of alternatives for dam and sediment removal was deemed necessary. This NOP incorporates features of the 1997 NOP and identifies a broadened range of alternatives under consideration. It supplements the Notice in the Federal Register, which identified the USCOE as the federal Lead Agency, and announced a federal scoping meeting which was held on November 4, 2004. (Federal Register Vol. 69, No. 189, September 30, 2004).

Enclosed is the project description, the five alternatives under study, and their environmental impacts. The five alternatives are: No Action Alternative, Dam Strengthening, Dam Notching, Dam Removal, and Carmel River Reroute and Dam Removal.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date and not later than 45 days from receipt of this notice.

If you have any questions, you may contact Richard Olebe at (916) 227-0533 or Project Engineer Y-Nhi Enzler at (916) 227-4624.

Original Signed By
John Vrymoed For

David A Gutierrez, Chief
Division of Safety of Dams
(916) 227-9800

Enclosure
Certified Mail

(Same letter sent to attached list.)

RAOlebe:TinaGlorioso
Notice of Preparation.doc
Spell check 9/24/05

SURNAME				
DWR 540 (Rev. 1/86)	Richard Olebe 9/27/05 R A Olebe for SE 9/27/05	9/27/05		

PROJECT DESCRIPTION

Project Location: The project area is within the upper reaches of the Carmel River, in an unincorporated portion of Monterey County. San Clemente Dam sits at the confluence of the Carmel River and San Clemente Creek (River Mile [RM] 18.5), approximately 15 miles southeast of the City of Carmel-by-the-Sea and 3.7 miles southeast of Carmel Valley Village. The project area includes the features associated with the proposed alternatives (see Local Vicinity Map). The alternatives are described below.

No Action Alternative: No modifications to the dam or its facilities would be completed. The dam would remain in an unsafe condition and be a continued threat to downstream life and property. The existing sediment would be left in place behind the dam. The reservoir would continue to accumulate sediment at an average rate of about 15 acre-feet per year. Minor sediment removal may occur in the future to allow continued diversion of water from the reservoir to supply Carmel Valley Village area. The existing drawdown ports in the dam and the existing fish bypass facility would both likely remain operational until the reservoir fills with sediment. Once the reservoir is filled with sediment, any further sediment carried by the river would flow over the dam and into the river downstream of the dam.

Dam Strengthening: The project sponsor proposes to construct a concrete buttress on the downstream face of the existing San Clemente Dam. Thickening the dam section, armoring the abutments, and modifying the spillway would address the seismic safety and overtopping concerns. The proposed modifications would meet requirements of the DWR, Division of Safety of Dams. A concrete batch plant would be installed onsite to manufacture the required concrete. The electrical system at the dam would be improved. Sediment accumulated behind the dam would be left in place, although minor sediment removal may be needed to maintain the existing surface water supply intake that serves the upper Carmel Valley Village area. Once the reservoir is filled with sediment, any further sediment carried by the river would flow over the dam and into the river downstream of the dam. Both the Carmel River and San Clemente Creek would be diverted around the reservoir and dam site, and the reservoir would be dewatered each year during construction. The plunge pool downstream of the dam would be completely drained prior to dam notching to allow access for construction workers and machinery for notching operations and new fish ladder construction.

The existing fish ladder would be replaced by a new fish ladder compliant with existing criteria for fish passage promulgated by NOAA Fisheries and the California Department of Fish and Game (DFG). Two high-level outlets, equipped with sluice gates, would be installed to enable controlled and limited sediment releases to maintain both upstream passage to the fish ladder exit and maintain water flow into the CAW diversion pipeline during the wet season.

A new access route to Carmel Valley Road (the "Tularcitos route") would be constructed to bypass the Sleepy Hollow community by crossing Tularcitos Creek and connecting Carmel Valley Road to the Carmel Valley Filter Plant. In addition, the Old Carmel River Dam Bridge (OCRB) and the access road from the filter plant to the dam would be improved. The existing access road along the east side of the Carmel River, between OCRD and the base of San Clemente, would be rebuilt.

A tower crane would be staged at the base of the dam to move construction materials from the batch plant to the dam face and fish ladder.

Dam Notching: The central portion of the dam would be cut down approximately 19 feet to elevation 506 feet in the area of the existing spillway bays. The proposed modifications would address the seismic safety and overtopping concerns and meet requirements of the DWR, Division of Safety of Dams. A new facility to divert water would be constructed upstream of the dam to replace the existing surface water diversion at San Clemente Dam. The electrical system at the dam would be upgraded to support a conveyor sediment transport system.

Both the Carmel River and San Clemente Creek would be diverted around the reservoir and dam site, and the reservoir would be dewatered each year during construction. The plunge pool downstream of the dam would be completely drained prior to dam notching to allow access for construction workers and machinery for notching operations and new fish ladder construction.

Sediment in the reservoir would be removed down to the level of the notch. The historic Carmel River channel exposed by sediment excavation in the reservoir's inundation zone would be restored as needed. Approximately 1.5 million cubic yards (930 acre-feet) of accumulated sediment would be removed over two seasons by excavation with heavy equipment. Sediment would be transported from the reservoir via a conveyor belt system and deposited in a disposal area east of San Clemente Reservoir. Further, sediment would no longer be accumulated by the reservoir, and would instead be carried by the river, and flow over the dam into the river downstream of the dam.

The existing fish ladder would be redesigned and rebuilt to accommodate the lowered dam elevation and to comply with existing criteria for fish passage promulgated by NOAA Fisheries and CDFG. A high-level outlet, equipped with a sluice gate, would be installed to enable controlled and limited sediment releases to maintain fish passage.

A new access route to Carmel Valley Road (the "Tularcitos route") would be constructed to reduce construction traffic impacts through the Sleepy Hollow community by crossing Tularcitos Creek and connecting Carmel Valley Road to the Carmel Valley Filter Plant. The Old Carmel River Dam Bridge (OCRB) and the access road from the filter plant to the dam would be improved. The existing access road along the east side of the Carmel River, between OCRD and the base of San Clemente Dam, and the High Road Access would be rebuilt. An existing 4WD road would be improved to connect Cachagua Road with the sediment disposal site. This route would be used only to

move construction equipment and materials necessary to construct the road, prepare the sediment disposal site, and to connect the sediment disposal site to the dam by conveyor belt. All sediment transport would occur via conveyor belt from the dam to the disposal site. No sediment would be hauled by truck over any roads.

Dam Removal: The dam would be demolished and removed from the site, thus eliminating dam safety concerns. The fish ladder may be left in place. A new facility to divert water will be constructed in the vicinity of the dam to replace the existing surface water diversion at San Clemente Reservoir. The electrical system at the dam would be upgraded to support a conveyor sediment transport system.

Both the Carmel River and San Clemente Creek would be diverted around the reservoir and dam site, and the reservoir would be dewatered each year during construction. The plunge pool downstream of the dam would be completely drained prior to dam removal to allow access for demolition.

Approximately 2.5 million cubic yards (1,555 acre-feet) of accumulated sediment would be removed over three seasons by excavation with heavy equipment. Sediment would be transported from the reservoir, via a conveyor belt system, to a disposal area east of San Clemente Reservoir. The historic Carmel River channel, exposed by sediment excavation in the reservoir's inundation zone, would be restored as needed. The reservoir would no longer trap sediment; therefore, the river downstream of the dam site would accumulate sediment as if no dam were constructed.

Any impacts to the river channel upstream of the dam, through the historic inundation zone, would be mitigated. A trap and truck facility would be built and operated at the OCRD to allow fish passage.

Existing access roads with minor improvements would be used to reach the base of the dam. The Old Carmel River Dam Bridge (OCRB) and the access road from the filter plant to the dam would be improved. The existing access road along the east side of the Carmel River, between OCRD and the base of San Clemente, would be rebuilt. In addition, an existing 4WD road would be improved to connect Cachagua Road with the sediment disposal site. This route would be used only to move construction equipment and materials necessary to construct the road, prepare the sediment disposal site, and to connect the sediment disposal site to the dam by conveyor belt. All sediment transport would occur via conveyor belt from the dam to the disposal site. No sediment would be hauled by truck over any roads.

Carmel River Reroute and Dam Removal: The dam and fish ladder would be demolished and removed from the site; thus eliminating the dam safety concerns. A new facility to divert water will be constructed in the vicinity of the dam to replace the existing surface water diversion at San Clemente.

Approximately 380,000 cubic yards (235 acre-feet) of accumulated sediment behind the dam, on the San Clemente Creek arm of the reservoir, would be relocated to the

Carmel River arm by excavation with heavy earthmoving equipment. A portion of the Carmel River would be permanently bypassed by cutting a 450-foot-long channel between the Carmel River and San Clemente Creek, approximately 2,500 feet upstream of the dam. The bypassed portion of the Carmel River would be used as a sediment disposal site for the accumulated sediment. The spoils from channel construction (235,000 cubic yards or 145 acre-feet) would be used for construction of a diversion dike at the upstream end of the bypassed reservoir arm. The sediments at the downstream end of the bypassed reservoir arm would be stabilized and protected from erosion.

The Carmel River and San Clemente Creek would be diverted around the reservoir and dam site, and the reservoir would be dewatered each year during construction. The plunge pool downstream of the dam would be completely drained prior to removal of the dam to allow access for demolition.

The San Clemente Creek channel would be reconstructed through its historic inundation zone, from the exit of the diversion channel to the dam site. A trap and truck facility would be built and operated at the OCRD to allow fish passage during construction. A notch would be cut into Old Carmel River Dam (OCRD), which is about 1,800-feet downstream of San Clemente Dam, in order to provide adequate fish passage.

Existing access roads, with minor improvements, would be used to reach the base of the dam. The Old Carmel River Dam Bridge (OCRB) and the access road from the filter plant to the dam would be improved. The existing access road along the east side of the Carmel River, between OCRD and the base of San Clemente Dam and the High Road Access would be rebuilt. In addition, an existing 4WD road would be improved to connect Cachagua Road with the reservoir.

Environmental Effects: Potential environmental effects, depending on which alternative is selected, include: Impacts to aquatic environments; impacts to listed species, including but not limited to, the federally threatened California red-legged frog (Rana aurora draytoni) and the federally listed Central California Coast steelhead (Oncorhynchus mykiss); water quality; cultural resources; traffic; fish and wildlife resources; and public health and safety, including sedimentation and increased downstream flooding.

Appendix B

NOTICE OF INTENT

Notice of Intent To Prepare a Draft Environmental Impact Statement for the Proposed San Clemente Dam Seismic Hazard Remediation Project--Carmel Valley, Monterey County, CA

[Federal Register: September 30, 2004 (Volume 69, Number 189)]
[Notices]
[Page 58414-58415]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr30se04-55]

DEPARTMENT OF DEFENSE
Department of the Army; Corps of Engineers

Notice of Intent To Prepare a Draft Environmental Impact Statement for the Proposed San Clemente Dam Seismic Hazard Remediation Project--Carmel Valley, Monterey County, CA

AGENCY: U.S. Army Corps of Engineers, DoD.
ACTION: Notice of Intent (NOI).

SUMMARY: The U.S. Army Corps of Engineers (USACE) has received an application for Department of the Army authorization from California-American Water Company (CAW) to deposit approximately 3,200 cubic yards of fill material into wetlands and other waters of the U.S. in association with remediating the safety hazards of an existing Dam on the Carmel River. This application is being processed pursuant to the provisions of Section 404 of the Clean Water Act (33 U.S.C. 1344) and in accordance with the National Environment Policy Act (NEPA) of 1969 (42 U.S.C. 4321 et seq.). In accordance with NEPA, USACE has determined that the proposed action may have a significant impact on the quality of the human environment and, therefore, requires the preparation of an Environmental Impact Statement (EIS). A combined Environmental Impact Report (EIR)/EIS will be prepared with the USACE as Federal lead agency and the California Department of Water Resources, San Joaquin District (DWR) as the State lead agency under the California Environment Quality Act (CEQA). The basic purpose of the proposed actions is to provide Dam safety. The overall project purpose is to have San Clemente Dam meet current standards for withstanding a Maximum Credible Earthquake (MCE) and the Probable Maximum Flood (PMF) while providing fish passage at the Dam; maintaining a point of diversion to support existing water supply facilities, water rights and services; and minimizing impacts on CAW rate payers.

DATES: A public scoping meeting for this project will be held on November 4, 2004, from 6:30 to 8:30 p.m. at the Rancho Canada Golf Club, 4860 Carmel Valley Road, Carmel Valley, California. A public agency scoping meeting for this project will be held on November 9, 2004, 10 a.m. to 12 p.m. at the same location. You may mail comments

to: Phelicia Thompson, U.S. Army Corps of Engineers, Regulatory Branch, 333 Market Street, 8th Floor, San Francisco, California 94105-2197.

FOR FURTHER INFORMATION CONTACT: Phelicia Thompson, 415-977-8452, or

SUPPLEMENTARY INFORMATION:

1. Background: Approximately 2.4 million cubic yards of sediment have accumulated behind San Clemente Dam since it was constructed in the early 1920s. Engineering studies of San Clemente Dam were conducted in the 1990s to evaluate seismic safety at the request of the California Department of Water Resources Division of Safety of Dams (DSOD). These studies concluded that at the maximum water surface elevation of 537 feet (the height of the Dam's crest), the Dam might not be stable under the MCE. The Dam could suffer severe structural damage leading to the potential loss of the reservoir during a MCE. In addition, under the PMF the Dam could overtop and the downstream abutment area would be susceptible to excessive erosion, leading to a risk of Dam failure. Based on these findings, DSOD has required that the San Clemente Dam be brought into safety compliance to withstand seismic loading from a MCE on nearby faults and safely pass the PMF.

2. Description of the Proposed Action: Dam Strengthening. CAW has proposed to meet seismic safety needs for the Dam and protect against the effects of a PMF by thickening the downstream face of the Dam with concrete. A concrete batch plant would be installed on-site to manufacture the concrete needed. Sediment accumulated behind the Dam would be left in place. However, minor sediment removal may occur to ensure proper functioning of the existing water supply intake serving the upper Carmel Valley Village area. Water in the reservoir may need to be lowered to reduce loading behind the Dam (depending on sediment levels). Inflowing streams would be diverted around the work area and the plunge pool at the base of the Dam would be dewatered during the Dam thickening. This proposed action also includes replacing the existing ladder with a new fish ladder compliant with existing

[[Page 58415]]

National Marine Fisheries Service (NMFS) and California Department of Fish and Game (CDFG) criteria to provide fish passage. A tower crane would be staged at the base of the Dam to move construction materials from the batch plant to the Dam face and fish ladder. Access to the Dam would be improved by building a new road along the east side of the Carmel River, between the Old Carmel River Dam and the base of San Clemente Dam. The Dam thickening project would take an estimated four years to complete.

3. Reasonable Alternatives: In accordance with the requirements of Section 15124 of the State CEQA Guidelines and 40 CFR 1502.14, reasonable alternatives to the proposed action will be evaluated in the Draft EIR/EIS as listed below:

a. Dam Notching Alternative. This alternative would meet the need to reduce seismic safety risks by notching the Dam. The action would reduce the mass sufficiently to avoid catastrophic failure of the Dam during a MCE event. Notching would also be of sufficient size to prevent overtopping of the Dam during the PMF. The gates, piers and walkway at the top of the Dam would be removed and the Dam would be notched to an elevation of about 505 feet in the area of the present spillway bays. Sediment in the reservoir would to be removed down to the level of the notch. A new intake structure would be constructed to

allow the Dam to continue serving the upper Carmel Valley Village area. A new access road would be constructed to connect Carmel Valley Road to the Carmel Valley Filter Plant, to bypass the Sleepy Hollow community and to improve safety for large construction equipment. In addition, road access from the filter plant to the Dam would be improved. The existing primitive road from the Old Carmel River Dam to the base of San Clemente Dam would be rebuilt to an elevation above winter flood levels. Both the Carmel River and San Clemente Creek would be diverted around the reservoir and Dam site and the reservoir would be dewatered each year during construction. Accumulated sediment would be removed from behind the Dam over two seasons by excavation with heavy equipment and transported from the reservoir by truck or via a conveyor belt system to a disposal area near the Carmel Valley Filter Plant. The existing fish ladder would be rebuilt compliant with existing NMFS and CDFG criteria to accommodate the lowered Dam elevation. The Carmel River channel in the inundation zone would be restored. The Dam notching project would take an estimated six years to complete, depending on the effects of annual precipitation upon the construction schedule.

b. Dam Removal Alternative. This alternative would eliminate seismic safety and flooding risks through the removal of the Dam and the accumulated sediment behind the Dam. A new access road would be constructed to connect Carmel Valley Road to the Carmel Valley Filter Plant, to bypass the Sleepy Hollow community and to improve safety for large construction equipment. In addition, road access from the filter plant to the Dam would be improved. The existing primitive road from the Old Carmel River Dam to the base of San Clemente Dam would be rebuilt to an elevation above winter flood levels. Both the Carmel River and San Clemente Creek would be diverted around the reservoir and Dam site and the reservoir would be dewatered each year during construction. Accumulated sediment would be removed from behind the Dam over three seasons by excavation with heavy equipment and transport from the reservoir by truck or via a conveyor belt system to a disposal area near the Carmel Valley Filter Plant. The existing Dam and fish ladder would be demolished and removed from the site. A new intake structure would be constructed to allow CAW to continue serving the upper Carmel Valley Village area. The river channel would be restored through the historic inundation zone. If the Dam and sediment were removed in stages, a trap and truck facility would need to be built and operated at the Old Carmel River Dam for at least three years. The Dam removal project would take an estimated seven years to complete, depending on the effects of annual precipitation upon the construction schedule.

c. No Action Alternative. Under this alternative, no changes to the existing Dam would be made. The Dam would be left in place with all its existing facilities, although the fish ladder would be replaced with a new ladder compliant with existing NMFS and CDFG criteria to provide fish passage. Most of the sediment would be left in place behind the Dam. The reservoir would continue to accumulate sediment at an average rate of about 15 acre-feet per year. Minor sediment removal may occur to maintain the existing water supply intake serving the upper Carmel Valley Village acre. The existing draw down ports in the Dam and the existing fish bypass facility would both likely remain operational until the reservoir fills with sediment. The existing road between the Carmel Valley Filter Plant and the Dam would be improved to provide access to the Dam site for fish ladder construction equipment and supplies.

4. Scoping Process: Pursuant to NEPA, the USACE must include a scoping process for the Draft EIS/EIR. Scoping preliminarily involves determining the scope of the issues to be addresses in the Draft EIR/EIS and identifying the anticipated significant issues for in-depth analysis. The scoping process includes public participation to integrate public needs and concerns regarding the proposed action.

a. Public Involvement Program: Venues for public comment on the proposed action will include: Scoping meetings to be held on November 4, 2004 in Carmel Valley; preparation of a Draft EIR/EIS; and receipt of public comment in response to the Draft EIR/EIS.

b. Significant Issues to be Analyzed in Depth in the Draft EIR/EIS include: Impacts to the aquatic environments; impacts to endangered species, including but not limited to the California red-legged frog and the California Central Coast steelhead; water quality; cultural resources; traffic, fish and wildlife resources; public safety, including downstream flooding; and other issues identified through the public involvement process and interagency coordination.

c. Environmental Review/Consultation Requirements: NEPA; Section 404 of the Clean Water Act; Section 401 of the Clean Water Act; Endangered Species Act; Magnusun-Stevens Act Provision--Essential Fish Habitat; Clean Air Act; National Historic Preservation Act.

d. Scoping Meeting/Availability of Draft EIR/EIS: The USACE will hold a public scoping meeting to provide information on the project and receive oral or written comments on the scope of the document. This scoping meeting for the project will be held at 6:30 p.m. to Thursday, November 4, 2004, at the Rancho Canada Gold Club, 4860 Carmel Valley Road, Carmel Valley, California. The Draft EIR/EIS is expected to be available for public review in winter of 2006.

Dated: September 21, 2004.

Calvin C. Fong,

Regulatory Branch Chief.

[FR Doc. 04-21994 Filed 9-29-04; 8:45 am]

BILLING CODE 3710-19-M

Appendix C

WRITTEN COMMENTS RECEIVED ON DRAFT EIR/EIS

June 14, 2006

Paula J Landis, Chief
California Dept of Water Resources
San Joaquin District
3374 East Shields Ave, Rm A7
Fresno CA 93726

RE: **San Clemente Dam Seismic Safety Project.**

As a homeowner living in the floodplain below this unsafe dam, I am delighted that the Dept of Water Resources is taking steps to find a permanent solution.

I opt for **Alternative 3**: Carmel River reroute, dam removal, and sediment stabilization, because it's a cost-effective, permanent, environmentally beneficial solution:--.

AL-9

* It permanently removes the risk of dam failure.
* By restoring the San Clemente Creek bed, it restores the river channel to a geologically stable pattern.
* It allows the fish free-flowing passage upstream and downstream.
* It limits the release of sediment downstream through the use of 2650 feet of the Carmel River bed to store the accumulated sediment.
* No need for massive movement of sediment by truck or conveyor belt.
* It limits short-term turbidity.
* It avoids the concrete batch plant operation.

CONCERNS

TR-12

TRAFFIC: For ALL alternatives, I am however concerned about the 3 or 4 year increase in traffic on Carmel Valley Road and in Carmel Valley Village, with attendant danger of accidents, plus wear and tear to roads and pavements. Money must be budgeted to restore the roads once the project is completed. And before construction begins, a traffic light must be installed at the dangerous intersection of Laureles Grade and Carmel Valley Road, assuming that traffic will increase there.

GEO-20

EROSION, POLLUTION, FIRE: Serious and ongoing steps must be taken to monitor and minimize run-off and erosion caused by construction activities. Steps must also be taken to minimize the increased risk of forest fire.

Linda Agerbak
25 Paso Hondo
Carmel Valley CA93924
(831) 659-5229



Ali Nolte
07/18/2006 02:47 PM
CDT

To: Jeremy Pratt/Entrix
cc: Ali Nolte/Entrix@Entrix
Subject: Re: FW: San Clemente Dam - Carmel River - Steelhead

Jeremy Pratt

From: Bob Baiocchi
Sent: Wednesday, July 12, 2006 7:43 AM
To: Mike Aceituno; Steve Edmondson; Kevan Urquhart
Cc: Hatler, Charyce; Roy Thomas; Hank Smith
Subject: San Clemente Dam - Carmel River - Steelhead

AL-34

Mr. Aceituno, NOAA Fisheries; Mr. Steve Edmondson, NOAA Fisheries; and Mr. Kevon Urquhart, DFG et al.....Please find enclosed the position of the Carmel River Steelhead Association regarding the Clemente Dam and the Carmel River. The best solution and most reasonable alternative is to have the dam removed because it is useless, the fish ladder does not work, the reservoir is filled with sediment and the dam is an obstruction to navigation and steelhead migration in the river. You don't abandon a defective authomobile in the middle of a public freeway to satisfy local politicial reasons. See attachment. Have it removed. Thank you.

Bob Baiocchi for

Carmel River Steelhead Association

cc: Dr. Roy Thomas, CRSA

Mr. Hank Smith, CRSA

Interested Parties (bcc)

CALIFORNIA COASTAL COMMISSION
45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE (415) 904-5200
FAX (415) 904-5400
TDD (415) 597-5885

June 20, 2006

Robert Smith
U.S. Army Corps of Engineers
San Francisco District
333 Market Street, 8th Floor
San Francisco, CA 94105-2197

RE: **Comments on the April 21, 2006 Draft Environmental Impact Report/Environmental Impact Statement for San Clemente Dam Seismic Retrofit Project, California American Water Company**

Dear Mr. Smith:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Report/Environmental Impact Statement for the San Clemente Dam Seismic Retrofit Project dated April 21, 2006. California American Water Company (CAW) proposes to retrofit the existing San Clemente Dam (SCD), inland of the coastal zone, by using the design option known as "downstream thickening." CAW would substantially thicken the dam at its downstream base, re-design the existing fish ladder and create a system of sluicing to relieve sediment build-up in the dam. The dam is owned and operated by the Coastal Division of CAW, a subsidiary of American Water, whose parent-company is RWE AG of Essen, Germany. The proposed improvements are intended to comply with California Department of Water Resources, Division of Safety of Dams (DSOD) requirements to address safety deficiencies, and guard against failure from a Maximum Credible Earthquake (MCE), and a Probable Maximum Flood (PMF) event, which could erode the existing dam abutments. Should the proposed project go forward, the Coastal Commission will require that a consistency certification be submitted to the California Coastal Commission for this federally-permitted project, based on its impacts in the coastal zone.[1] This regulatory requirement arises under Section 307 of the federal Coastal Zone Management Act.[2] The consistency certification should include a finding as to whether the activities are consistent with the California Coastal Management Program and the necessary information to support that conclusion, including an analysis of the project's consistency with Chapter 3 of the Coastal Act. (See CFR Section 930.58 for a full listing of the information required for a complete consistency certification.)

NEPA/ CEQA-9

1 Unless the Corps itself assumes responsibility for the project (see following paragraph).

2 16 U.S.C. Section 1456, with implementing regulations at 15CFR Part 930.

In addition to the proponent's proposed strengthening of the SCD, three viable alternatives to the project were submitted: dam notching, dam removal and dam re-routing and removal. It appears likely that, should one of these alternatives be proposed, the U.S. Army Corps of Engineers will become the project proponent. Should this happen, rather than the procedure described in the previous paragraph, the Corps will need to submit a consistency determination to the Coastal Commission. This regulatory requirement arises under Section 307 of the federal Coastal Zone Management Act. The consistency determination must describe how the project is consistent to the maximum extent practicable with the policies of Chapter 3 of the Coastal Act. (See CFR Section 930.39 for a full listing of the information required for a complete consistency determination).

Because no alternative has yet been chosen for this project, Coastal Commission staff has focused its review of the Draft EIR/EIS on certain key issue areas central to effects of this project in the coastal zone.

Beneficial Sediment Management and Beach Health

Section 30233 (b) of the California Coastal Act states that:

> *Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable longshore current systems.*

Section 30233 (d) states:

> *Erosion control and flood control facilities constructed on watercourses can impede the movement of sediment and nutrients which would otherwise be carried by storm runoff into coastal waters. To facilitate the continued delivery of these sediments to the littoral zone, whenever feasible, the material removed from these facilities may be placed at appropriate points on the shoreline in accordance with other applicable provisions of this division, where feasible mitigation measures have been provided to minimize adverse environmental effects. Aspects that shall be considered before issuing a coastal development permit for such purposes are the method of placement, time of year of placement, and sensitivity of the placement area.*

As discussed below, SCD has prevented the natural transport to the coast of a large volume of beach-quality material, and there has been erosion at several of the beach areas that would have been supplied sand from the Carmel River had SCD and reservoir not trapped this sand over the past 80 years. The Draft EIR/EIS should provide information on the quantity and quality of sediment trapped by SCD, identify environmentally advantageous options for delivering to the beach and littoral zone appropriate sediment, and identify environmentally advantageous options for placing sand on the beach or in the nearshore zone.

NEPA/ CEQA-10

At this time, 59% of the sediment budget of the Carmel River is diverted and stored behind SCD.[3] Over 2.5 million cubic yards of sediment are currently trapped behind the SCD. Under natural circumstances, much of that sediment would have been deposited at the mouth of the Carmel River, replenishing the beach, contributing to a healthy littoral cell and enhancing the lagoon behind the beach and surrounding wetlands. Barry Hecht[4] reported that 95% of the sediment trapped behind the SCD is sand,[5] which could be an important component of the Carmel River State Beach. A subsequent sample of the sediment analyzed by CAW indicated at least 50% of the sediment is of a size suitable for beach sand. There is reason to believe that much of the reservoir sediments would be compatible with the littoral cell sediments. Further testing of the sediments in the reservoir is needed to determine the volume of reservoir sediment that could be considered acceptable for beach or nearshore nourishment.

NEPA/ CEQA-11

The Carmel River Advisory Committee of the Monterey Peninsula Water Management District, and its technical advisory committee have expressed concern over beach erosion at Carmel River State Beach[6] as part of an overall study of the entire Carmel Valley Watershed. Draft Findings of the Monterey County LCP Periodic Review, December 2003, indicate severe beach erosion at the mouth of the Carmel River, and the SCD has been designated a "potential priority site for sediment supply intervention."[7]

There is broad consensus that the beach is subject to long term erosion and sand depletion, and there is clear flooding danger to nearby homes and State Park resources as a result of sand erosion. "The Beach area below Scenic Road – between the State Beach parking lot and Stewart's Cove has experienced degradation (loss of sand) to the point of being increasingly subject to the impact of wave run up, high surf, and high swell action."[8] This north end of the beach has historically been a graded ramp up to Scenic Road, which is at an elevation of about 35 feet. That ramp has lost so much sand that the beach has become a bluff at the edge of Scenic Road, and part of the road is being undermined by wave activity. The nearby houses are also in danger of being undermined, as is the State Beach parking lot located adjacent to this part of the beach. NOAA members of the Carmel River Watershed technical advisory team have suggested that anywhere from 40,000 to 250,000 cubic yards of sand could be strategically placed on the beach in order to minimize the adverse effects that are taking place there now. NOAA estimates this placement would have to take place infrequently, perhaps every 10 years.

The barrier beach at the mouth of the river requires repeated mechanical breaching each winter to avoid the lagoon behind it flooding the nearby houses. The necessity, frequency and characteristics of mechanical breaching are believed to be greatly influenced by the complex and degraded state of the river. "Hungry" or sediment-starved water, in conjunction with increased incision and erosion at certain points of the river appear to have created much more deeply

3 California Beach Restoration Study, January 2002, pg. 7-14.

4 Barry Hecht, Principal, Balance Hydrologics, Berkeley, CA. balancehydro.com.

5 "Sediment Yield Variations in the Northern Santa Lucia Mountains." Barry Hecht. Double Cone Quarterly. Originally published in the Spring 2000 guidebook of the Peninsula Geological Society.

6 Monterey Peninsula Water Management District. Draft Agenda, Regular meeting of the Carmel River Advisory Committee, February 2, 2006.

7 CA Beach restoration Study January 2002 pg. 7-36.

8 Monterey County Carmel River Lagoon Draft Proposed Short Term Management. November 9, 2005. Measures proposed for Winter of 2005-2006 only.

incised river and breaching channels. NOAA has documented a steep decline in channel area since 1929, using aerial photos.[9] It is likely that mechanical breaching in conjunction with the shrinking river channel results in such forceful breaching that sand is carried and pushed off the beach into the near-by deep canyon. The force has other adverse effects, such as flushing juvenile steelhead (indeed, all biota) out of the lagoon before smoltification is complete.[10]

NEPA/ CEQA 12

The proposed action and alternative 1, dam thickening and dam notching, include sluicing some of the existing and future sediment past the dam into the river flow in an effort to "maintain the existing surface water supply intake in the reservoir, and to ensure fish passage through the accumulated sediment." These plans will not return a substantial portion of the trapped sand to the beach, and what sand there is in these sluiced waters will almost certainly take many years to get to the beach. Alternatives 2 and 3, dam removal and dam re-route and removal, both entail locking up the accumulated sediment permanently using two different disposal methods. In either case, the accumulated sand that would have naturally made its way to the beach would be permanently inaccessible to the beach. Sediments in the waters from upstream of the removed dam would take many years to get to the beach, as well.

NEPA/ CEQA-13

NEPA/ CEQA-14

Neither the proposed action, nor any of the alternatives, includes a plan for delivering any amount of the sand and gravel currently trapped behind the dam to the beach. The Draft EIR/EIS should include information on changes to downstream morphology from the proposed plan and alternatives, a plan for allowing delivery of some of the accumulated sand to the beach, in a manner that would best benefit the entire riverine system, and in particular, the portion of the river located in the coastal zone. In addition, the Draft EIR/EIS should propose options for environmentally advantageous placement or use of beach compatible sediments for beach nourishment. Several groups are studying the changes to the Carmel River and Carmel River Beach, including the Carmel River Watershed technical advisory committee and Monterey County. Examination of options for riverine morphology and beach and nearshore nourishment can and should be coordinated with these on-going efforts. The Commission staff will need information on the effects of this project on down stream morphology and coastal processes in order to complete our review and determine whether the proposed action, or alternatives, are consistent with Section 30233 (b) and (d) of the California Coastal Act.

SED-18

TR-10

The proposed construction and improvement of roads for the project and for the alternatives does not include road design that results in the least storm run-off for the life of the road. We would like to see a plan for road design that incorporates those elements that will most effectively allow for the least run-off, and the least concentrated run-off. Access road improvements are assumed to be in service for the life of the dam or the sediment storage areas, and the mitigation should include plans for the same time period, not just for construction.

GEO-1

Page 4-10 of the Draft EIR/EIS describes mitigation for issue GS-4, Soil Erosion, but includes mitigation only "with implementation of standard erosion control methods and BMPs

9 Brian Cluer, NMFS, who carried out the photo survey. Conversation 6/8/06.

10 Larry Hampsen, MPWMD. Conversation 6/8/06.

GEO-1 *on the down slope side* of all construction zones. (Italics added). The Draft EIR/EIS should include soil erosion mitigation and BMPs upslope as well as down slope of construction zones.

Introducing sediment into the river by sluicing, as in the proposed project and alternative 1, could adversely affect steelhead and their habitat by causing abrasion of the fish, decreased dissolved oxygen, disturbance of streambeds and filling of the interstitial spaces between spawning gravel. Where the sluicing operations are described in the Draft EIR/EIS as mitigation SED-19 for "short-term, significant and unavoidable" effects, it would appear that the mitigation itself FI-21 could possibly cause long-term changes in the amount and type of sediment transported from the upper watershed to the lower Carmel River, changes in the sediment composition in the river and changes in the amount of sediment stored in the river below SCD. The sluicing operations proposed require further study to determine their efficiency and long-term effects, particularly with regard to the part of the river that is in the coastal zone.

The Draft EIR/EIS shows that any method of slowly releasing the accumulated sediment into NEPA/ the river in an effort to mimic natural processes would greatly decrease water quality, to the CEQA-15 point of endangering the steelhead fishery. It would appear that this option has not been fully explored.

Sediment Disposal

Alternatives 2 and 3, dam removal and dam removal and re-route, would excavate and dispose of the more than 2.5 million cubic yards of sediment that are now stored behind the dam. Notwithstanding the beneficial re-use of river sediment, these sediment piles should be held to AA-20 the same standards regarding "Maximum Credible Earthquake" and "Probable Maximum Flood" as the dam itself. If the debris pile in either alternative should fail during an earthquake or a flood, it would effectively dam off the river again. The project description should account for these standards, their implementation, monitoring and maintenance with regard to the sediment storage piles.

In Alternative 3, the sediment storage plan appears to include the possibility of voids in the sediment pile, such as decomposing tree trunks, because not all of the sediment would be excavated to the original streambed, and sediment close to the dam would be piled on top of existing sediment. Large organic items that were originally covered when the dam filled, and AA-21 later buried when the sediment began to collect, could have had some contact with air, continue to decompose and leave a void. The Draft EIR/EIS should include a plan to eliminate the possibility of voids. It is possible that the stabilizing plan for this pile, i.e., the soil-cement grid, would obviate this danger. If this is the case, the Draft EIR/EIS should explain how the soil-cement grid would accomplish this.

Regarding issue WQ16, Sediment Disposal, on page 4-94, mitigation includes annual monitoring of the sediment pile by CAW *at the end of the rainy season* in order to observe erosion problems. (Italics added). The sediment piles should be monitored occasionally WQ-1 throughout the rainy season so that erosion problems can be mitigated before the maximum impact.

Fisheries

It is well established that dams change the magnitude and timing of river flows, trap sediment, alter river temperatures, and impede or completely obstruct the movement of fish upstream of the dam, contributing to the decline of Pacific salmon and steelhead trout populations in California.[11] In particular, the San Clemente Dam and water diversions on the Carmel River have caused severely adverse effects on the steelhead population, leading to the decline of that population. California Department of Fish and Game (CDFG) points out that "maintaining healthy watersheds and sufficient flows must be our highest priority," when dealing with adverse effects to instream habitat.[12]

The California Coastal Act provides for the protection of marine resources and fisheries in the case of species of biological significance, such as Steelhead, and when the uses of a marine environment have effects on the coastal zone. Section 30230 of the California Coastal Act requires:

> *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

Section 30231 requires:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Section 30234 states:

> *Facilities serving the commercial fishing and recreational boating industries shall be protected and, where feasible, upgraded. Existing commercial fishing and recreational boating harbor space shall not be*

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11 California Beach Restoration Study, January 2002. pg. 7 – 10.

12 "Steelhead Restoration and Management Plan for California" by Dennis McEwan Associate Fishery Biologist Inland Fisheries Division, Sacramento, and Terry A. Jackson Associate Fishery Biologist Inland Fisheries Division, Sacramento Under the Supervision of Forrest Reynolds Tim Curtis Assistant Chief and Senior Fishery Biologist Inland Fisheries Division Inland Fisheries Division. http://www.dfg.ca.gov/nafwb/pubs/swshplan.pdf. Pg. 73.

> *reduced unless the demand for those facilities no longer exists or adequate substitute space has been provided. Proposed recreational boating facilities shall, where feasible, be designed and located in such a fashion as not to interfere with the needs of the commercial fishing industry.*

Section 30234.5 states:

> *The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.*

The steelhead in the Carmel River (subsequently migrating to coastal waters) are currently under a level of stress that threatens their survival as a healthy, genetically diverse population, due primarily to the adverse effects of water diversion and the interruption of the natural sediment transport in the river by the Los Padres and San Clemente dams. These factors have resulted in a degraded river with insufficient areas suitable for spawning and rearing of juveniles. Extraordinary measures are currently employed on the river to accommodate steelhead, such as a rearing facility, fish ladders and trap and truck operations. These artificial management methods all cause very high mortality rates that threaten the long-term health of the steelhead population. The construction activities of each of the project alternatives would put additional stress on the steelhead population that may reduce the population to a size that threatens loss of genetic diversity and fitness, and could reduce it to a remnant. Genetic diversity is directly correlated with population size, and the maintenance of genetic diversity of this steelhead population is essential for the fitness of the population and its preservation. The CDFG finds:

> *Loss of rare alleles due to reduction in the size and number of populations is another mechanism that can cause a decrease in genetic diversity and fitness...Genetic drift is the change in allele frequencies of a population due to random chance. Genetic drift has its greatest effect on small populations: the smaller the number of breeders, the greater the chance that some alleles will not be represented in the breeding population. A small number of breeders is unlikely to represent the full range of genetic diversity of the population from which they came. This can result in the loss of genetic variability in populations (Futuyma 1986).*[13]

FI-22

The proposed project, as well as the proposed alternatives, will interrupt and reduce flow levels of the Carmel River, particularly during Summer and Fall months when most of the construction will take place, and the river is naturally at its lowest. Among the proposed alternatives, the shortest estimated duration of construction is two years, while the longest is five years. Each alternative would disrupt spawning, rearing and migration, putting great additional stress on an already stressed population. A significant additional reduction in numbers would substantially reduce the viability of the population. The Draft EIR/EIS either should acknowledge that this accumulation of stress will likely cause a reduction in the steelhead population's size, genetic diversity and fitness, or should demonstrate convincingly why such

13 Steelhead Restoration and Management Plan for California, Dept. of Fish and Game, February 1996, pg. 83 and 84.

FI-22

adverse effects will not take place. Further, the Draft EIR/EIS should include an alternative that shows the feasibility of off-stream water storage, in order to maximize flows during the low-flow periods that are most detrimental to the steelhead, as described by NMFS.[14]

Introducing sediment into the river by sluicing, as in the proposed project and alternative 1, could adversely affect steelhead and their habitat by causing abrasion of the fish, decreased dissolved oxygen, disturbance of streambeds and filling the interstitial spaces between spawning gravel. Where the sluicing operations are described in the Draft EIR/EIS as mitigation for "short-term, significant and unavoidable" effects, it would appear that the sluicing itself could possibly cause long-term changes in the amount and type of sediment transported from the upper watershed to the lower Carmel River, changes in the sediment composition in the river and changes in the amount of sediment stored in the river below SCD. The sluicing operations proposed require further study to determine their efficiency and long-term effects, particularly with regard to the part of the river that is in the coastal zone. The Draft EIR/EIS shows that any method of slowly releasing the accumulated sediment into the river in an effort to mimic natural processes would greatly decrease water quality, to the point of endangering the steelhead fishery. It would appear that long-term sluicing of the entire accumulation of sediment has not been adequately explored.

FI-23

In neither section 4.4 Fisheries or Appendix G Carmel Reach Descriptions, does the Draft EIR/EIS adequately describe the fisheries potential in each of the reaches of the Carmel River. Because each reach is quite unique in terms of human impact and habitat conditions, the Draft EIR/EIS should include more detailed fisheries information in narrative form for each reach of the river, including a description of spawning and rearing habitat, current artificial management efforts and estimates of steelhead mortality rates from all causes. The current descriptions of reaches 0 through 3 include good information regarding spawning and rearing potential for steelhead, but descriptions of reaches 5 through 7 include no fisheries information. Descriptions of reaches 8 and 9 include only the barest information regarding fisheries. The Draft EIR/EIS

FI-24

should include a more detailed map of each river reach with current fisheries conditions and short and long term changes expected as a result of the proposed project.

FI-25

Mitigation for FI-4 effects—Reservoir Drawdown, and FI-5 effects—Diversion of Carmel River and San Clemente Creek for Construction Purposes, consists of trapping fish above the reservoir and relocating them to "other suitable habitat downstream of the SCD." The Draft EIR/EIS should include a detailed plan for this relocation and an assessment of the risks, given the high mortality rate currently experienced at the Sleepy Hollow Rearing Facility and the existing trap and truck operations, and the low rates of successful rearing on the river as a whole. This plan should be subject to review by NMFS, DFG and USFWS.

NEPA/ CEQA-17

The Commission staff would like to see in the Draft EIR/EIS an alternative that includes and explores the following NMFS recommendations:

14 "Instream Flow Needs for the Carmel River," pg. 29, June 3, 2002, National Marine Fisheries Service, Southwest Region.

NEPA/ CEQA-17

Probably the greatest single opportunity for substantially mitigating these impacts would be for Cal-Am to: 1) increase its diversions during seasonal (winter) high flows, 2) adhere to the minimum bypass flows and cumulative diversion rate recommendations, 3) store the diverted winter waters off stream (either Aquifer storage or ponds) for use during periods of low flow, and 4) make concomitant reductions in its unlawful diversions from the Carmel River. With these actions, Cal-Am would greatly reduce its diversions during low flow periods, while offsetting those reductions with additional diversions during the high flows of winter. [15]

Pagination of Draft EIR/EIS

GEN-10 The pagination of the Draft EIR/EIS makes navigation of the report very difficult. We would appreciate it if the pagination included more than the main section number plus the page number, e.g., 1-x, 2-x, 3-x or 4-x, and included the subsection number as well, e.g., 1.2-x or 2.5-x, etc. In the CD Rom version, it would be helpful if references to other sections, including the table of contents, were hyper linked for easy navigation.

Errata

GEN-11 The Draft EIR/EIS variously refers to Old Carmel River Dam (OCRD) as 1,500 feet (pg. 2-5), 1,700 feet (pg. 3-30), 1,800 feet (pg. 3-40) and 0.5 miles (pg. 4-102) downstream of SCD.

Thank you for the opportunity to comment on the Draft EIR/EIS for the San Clemente Dam Seismic Retrofit Project. We look forward to working closely with you and your staff throughout the consistency certification/consistency determination process for this project. If you have questions, please contact Diane Livia at 415-904-5250, dlivia@coastal.ca.gov. If you have questions about the federal consistency process, please contact Larry Simon, the Commission's federal consistency coordinator, at 415-904-5288.

Sincerely,

Mark Delaplaine
Federal Consistency Supervisor

CC: California American Water, Inc.
Rick Hyman, Santa Cruz District Office, CA Coastal Commission
Mark Johnsson, Headquarters, CA Coastal Commission
Lesley Ewing, Headquarters, CA Coastal Commission
John Dixon, Headquarters, CA Coastal Commission

15 "Instream Flow Needs for the Carmel River," pg. 29, June 3, 2002, National Marine Fisheries Service, Southwest Region.

June 30, 2006

Paula J. Landis, Chief
California Department of Water Resources
San Joaquin District
3374 East Shields Avenue
Fresno, CA 93726-6913

Robert Smith, Project Manager
U.S. Army Corps of Engineers
San Francisco District
333 Market Street, 8th Floor
San Francisco, CA 94105-2197

RE: Comments on San Clemente Dam Seismic Safety Project Draft EIR/EIS

Dear Ms. Landis and Mr. Smith:

Thank you for the opportunity to review and comment on the San Clemente Dam Seismic Safety Project Draft EIR/EIS. The Coastal Conservancy has been working in the Carmel River watershed for many years to preserve and restore the resources of the river and lagoon. Through the Conservancy and other agencies, the State has invested considerable funding in the watershed, and the Conservancy wants to ensure the Seismic Safety Project is undertaken in such a way as to be compatible with existing investment by the State of California. The Conservancy's comments are as follows:

CR-3

1. **Section 1.4 Project Purpose, Need & Objectives.** The fourth stated objective of the project is to "minimize financial impacts to CAW rate payers". The EIR/EIS should provide cost estimates for each of the alternatives, including the costs of ongoing maintenance. Without this information, the alternatives can not be assessed in regards to this objective.

SED-12

2. **Carmel River Lagoon.** The EIR/EIS should examine the current effects of dam sediment retention on the dynamics of the Carmel River lagoon, and then examine the impacts of sediment releases under the different alternatives.

FI-11

3. **Old Carmel River Dam** (OCRD). The proposed project and all alternatives propose notching the OCRD to improve fish passage. This will not provide complete and unimpaired passage for fish at this location. Complete removal of the OCRD should be included as

FI-11, con't

mitigation for ongoing fish impacts under the proponent's proposed project and Alternative 1.

AA-19 NEPA/ CEQA-4

4. **Alternatives considered**. The EIR/EIS analyzes two alternatives for dam removal – one which involves complete removal of all of the accumulated sediment from the area and one which would re-route the Carmel River to isolate the accumulated sediment. The EIR/EIS should also evaluate the potential for stabilizing the sediment along the banks of the Carmel River and allowing a new conveyance channel to be cut along the original stream thalweg, or some other alignment, through the reservoir. The approach being used for sediment stabilization on the Elwha Dam Removal project could serve as a model.

GEN-6

5. **Learn from experience**. The EIR/EIS does not refer to any of the literature on dam removal. If the dam removal literature was reviewed in developing the alternatives, it should be cited. If it was not reviewed, then it should be and the alternatives should be revised based on the experience of earlier work and research.

GEO-6

6. **Alternative 3, Issues GS-5: Diversion Bypass Blasting**. As stated in the EIR under Alternative 3, blasting to create the diversion bypass channel will "irretrievably alter the landscape by removing approximately 145 acre-feet of rock…" (p. 4-14). Irretrievably altering the topography in such a substantial way should be a significant impact.

7. **Alternative 3 Impact Analysis**. The impact analysis for Alternative 3 does not adequately describe or evaluate the hydrology and water resources impacts. A list of additional issues that should be evaluated include:

HY-2

a. Capacity of San Clemente Creek to transport the water, sediment, and woody debris diverted from the Carmel River into the creek. Analysis should evaluate things such as volume and velocity at peak flows, potential for bank or channel scour as a result of changed hydrology, potential for log jams, etc.

HY-3

b. Changes to channel bed geometry in San Clemente Creek – aggrade or degrade the creek bed. If the creek bed degrades, how far upstream would this degradation be expected to migrate?

HY-4

c. Changes in groundwater elevation along the abandoned portion of the Carmel River channel.

FI-12

d. In the Fisheries section, the amount of spawning and/or rearing habitat that would be permanently lost in the abandoned portion of the Carmel River should also be analyzed.

Depending on the findings of the hydrology and water resources impact analysis, additional impacts may need to be analyzed including:

FI-13

e. Long-term impacts to spawning and/or rearing habitat as a result of changes in San Clemente Creek hydrology and channel morphology.

TE-8

f. Impacts to riparian habitat along San Clemente Creek as a result of channel bed or bank erosion caused by changes in hydrology.

TE-9

g. Impacts to the wetland and riparian habitats if the groundwater elevation drops along the reach of the Carmel River that is to be abandoned.

GEN-7

8. **Alternative 2, Water Quality Impact Analysis.** Where does this section start? Page 4.93 appears to be in the middle of the discussion, but there is no heading to mark the beginning.

9. **Issue FI-8 Upstream Fish Passage.** The impacts of the proponent's proposed project and Alternative 1 on upstream fish passage are not adequately described in the document. Both alternatives are described as beneficial to upstream fish passage. However, there will be permanent long-term impacts to upstream fish passage under these alternatives. Specifically:

NEPA/ CEQA-5

a. Upstream adults:
   i. No matter how well a fish ladder is designed, there is always a subset of the population that will be blocked and almost all of the population will experience some delay.

FI-14

   ii. The proposed fish ladder will have delay by design for sluicing operations. The significance of the delay has been mischaracterized by a) comparing it to natural delays with which any stock has co-evolved and b) citing studies for long-run salmonids in the more constant flows of the Columbia river system. Delay is unlikely to be as significant to long-run fish in steady flows as it is to Carmel steelhead. In the reservoir, upstream movement is likely to be impacted despite sluicing operations (see SOMP comments below)

SED-13 FI-15

   iii. The potential delay on fish passage may be significantly underestimated. Page 3-35 of the document acknowledges that "significant storm events might cause excessive build up and clogging of the upstream channel that cannot be cleared by sluicing alone." For this reason, the EIR/EIS anticipates the need for dredging the channel every 3 years. Based on this, it seems that passage could be blocked for significantly longer periods of time than are analyzed in the EIR/EIS if dredging is needed to clear the channel.

NEPA/ CEQA-6

b. Downstream juveniles:
   i. The proponent's proposed project should improve downstream passage at the dam over current conditions, but passage through the sluice or over the dam in spillway will still have an impact.

FI-16

   ii. Passage through the reservoir is likely to be poorer (higher water temperature, decreased cover, increased predation) in perpetuity under sluicing operations than it was with a deep reservoir just a few years ago and certainly poorer than a renatuaralized stream reach.

SED-14 FI-17

10. **Issue FI-9 Sediment Impacts to Downstream Channels from Sluicing, Dredging o Sediment Transport Downstream.** The impacts to steelhead from sediment caused by sluicing operations would be significant and permanent. The mitigation discussion states that "sluicing operations would begin with short duration sluices and impacts would be thoroughly evaluated to determine effects on downstream channels, habitats, and fishes." More information needs to be provided about regarding this intended course of action. What will be done to keep the upstream channel clear if short duration sluices are not sufficient to

SED-14 FI-17, con't

do so? What level or type of downstream impact would trigger a change in the SOMP, given that the impact is already identified as significant? If downstream impacts are such that different course of action is warranted, what would the alternative approach be to dealing with sediment in the reservoir?

NEPA/ CEQA-7

11. **Alternative 1, Issue FI-13: Stream Sediment Removal, Storage, and Associated Restoration.** The determination states that the impact is significant, unavoidable, and long-term; however, the impact discussion states that the impact is temporary. These two statements are inconsistent.

TE-10

12. **Section 4.5 Vegetation and Wildlife, All impact discussions**. The determination of impact significance should include a temporal element as it does in the other impact discussions. That is, impacts that are temporary, lasting through part or all of the construction period, should be differentiated from those that will extend beyond the construction period.

TE-11

13. **Issue VE-4: Indirect Effects on Native Vegetation**. The fifth paragraph of the mitigation section on page 4-194 addresses revegetation of cut slopes, fill areas, etc. It states that, "If non-natives are included in the seed mix, these would be species known not to be invasive or persistent." Non-natives should not be included in the seed mix under any conditions.

GEN-8

14. **Vegetation and Wildlife Impacts**. The impact of sediment released by sluicing operations on downstream aquatic habitat and aquatic fauna are not analyzed and should be. This would be a ongoing, permanent impact and could be significant.

WET-1

15. **Issue WET-1: Permanent Loss of Wetlands and Other Waters of the U.S**. The mitigation for this impact states that lost acreage would be replaced through either or both of two options: 1) restoration of other wetlands at a 3:1 ratio; and/or 2) conservation of existing wetlands at a 1:1 ratio. If only option 2 is used, it would result in a net loss of wetlands which would not be sufficient mitigation to make the impact less than significant. The mitigation should be structured so there is no net loss of wetland acreage. It is unlikely that created or restored wetlands will function at as high a level as the existing wetlands that will be permanently lost. Therefore, conservation of existing wetlands may be suitable as a way to augment wetlands loss that is also mitigated through creation or restoration of wetlands in order to make up for the functional loss. But it is not sufficient as mitigation on its own.

WET-2

16. **Alternatives 1 and 3, Issue WET-1: Permanent Loss of Wetlands and Other Waters of the U.S**. It is not clear how loss of Other Waters of the U.S. would be mitigated.

NEPA/ CEQA-8

17. **Section 5.5 Relationship Between Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity**. One of the project purposes stated in Section 1.4 is to "provide fish passage at the dam." Any option that leaves the dam in place will have impacts on passage of adults, juveniles and kelts that cannot be fully mitigated. As such, the last paragraph of Section 5.5 is understated and incomplete. See comment on Impact FI-9 Upstream Fish Passage for more details.

GEN-9 18. **Appendix D.** The figures referred to in the memo should be included.

19. **Appendix J, Sluicing Operations and Maintenance Plan.**

a. Based on the information provided in Appendix I, the Sluicing Operations and Maintenance Plan (SOMP) outlined in Appendix J does not seem sufficient to maintain a viable channel from the exit of the fish ladder to the reaches above the reservoir. The impact discussion for Issue FI-9 states that sluicing operations would occur over a 1 to 4 hour event when flow is over 300 cfs and increasing. According to Section 3.3 of Appendix I, the incised channel created by each sluicing event could be filled back-in within a few days. Given the unpredictability of stream flows in the river, sluicing will not provide a sufficient guarantee that there will be an adequate channel for fish passage from the exit of the fish ladder to the reaches above the river. The proponent's proposed project and Alternative 1 must develop a more reliable way to insure fish passage past the ladder.

FI-18
SED-15

b. The sluicing operations presented for the proponent's proposed project and the Alternative 1 are untested and lack specificity. In addition, the plan is based on migration records of an already residual run and an idealized world of average hydrology, single storm events and steady state conditions. Real operations, with the vagaries of real-time hydrology, sediment movement, debris and difficulty in access/operation during storm are likely to overwhelm the flexibility of the chosen system. The proponent's project and Alternative 1 need to define an alternate approach that would be used if sluicing operations are not adequate maintain fish passage without significant impacts on fish or downstream reaches.

FI-19
SED-16

FI-20
SED-17 20. **Operations and Maintenance, Proposed Project and Alternative 1.** Both the proponent's proposed project and Alternative 1 will require permanent ongoing maintenance of the fish ladder and the sediment behind the dam (through sluicing or other methods) to mitigate for impacts of leaving the dam in place. How will this maintenance be guaranteed? Will there be a maintenance endowment?

Again, thank you for opportunity to comment. If you have questions regarding any of these comments or the Conservancy's involvement in the Carmel River watershed, please contact me at tchapman@scc.ca.gov or 510-286-0749.

Sincerely,

Trish Chapman
Project Manager



June 28, 2006

California Sportfishing Protection Alliance

Ms. Charyce Hatler
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Re: San Clemente Dam Seismic Safety Project draft Environmental Impact Report/Statement

Dear Ms. Hatler and Mr. Smith,

The California Sportfishing Protection Alliance submits the following comments on the California Department of Water Resources' and the U.S. Army Corps of Engineers' *San Clemente Dam Seismic Safety Project Draft Environmental Impact Report/Statement* (DEIR/S) of April 2006. We appreciate this opportunity to comment on this project and request careful consideration of these comments as well as those submitted by other organizations and individuals.

It has been 26 years since the DWR's Department of Safety of Dams (DSOD) first began to look into the long-term safety of the San Clemente Dam and 16 years since an engineer hired by Cal-Am determined that the dam could fail in both MCE (Maximum Credible Earthquake) and PMF (Probable Maximum Flood) conditions.

SA-5 Meanwhile, human life, especially the Camp Stephanie community directly downriver, remains in danger from dam failure resulting from an earthquake with a magnitude as low as 5.5. In addition, the dam continues to adversely affect environmental values of the Carmel River watershed.

AS/O-28 We urge you to select Alternative 3, river reroute and dam removal, as the preferred project to ensure the long-term safety of the residents of the Carmel River Valley as well as the continued protection and improvement of the environment that provides critical habitat for the "threatened" steelhead and California red-legged frog.

AS/O-29 We also find that leaving the dam structure in place (Proponent's Proposed Project, dam thickening, and Alternative 1, dam notching) will result in significant and ongoing impacts to the environment and will not resolve the safety issue, but only prolong the burden on the ratepayers of maintaining and ultimately removing the structure at some point in the future.

SED-50 Furthermore, the technical design for "sluice gates" required for both the Proponent's Proposed Project (PPP) and Alternative 1, is inherently flawed for several reasons. First,

SED-50 relying on the sluice gates as the primary method of sediment management will lead to significant unintended consequences caused by ongoing release of the sediments to prevent future build-up of sediment above the dam structure. The continuous release of sediment will result in impacts to water quality, will continue to cause degradation of habitat downstream of the dam site, and will assure that present trends in scouring just below the dam structure will also continue to occur.

FI-9 Both the PPP and Alternative 1 also require a fish ladder to allow fish passage above the dam structure. Unfortunately that will also threaten survival of migrating steelhead unable to navigate safely through the area directly above the sluice gate, causing fish to become caught up in the downstream flow, and back downstream through the sluice gate.

AS/O-30 The fish ladder design and the flawed sluice gate design would most probably result in a Jeopardy Opinion under the Endangered Species Act. This will delay the start of a project indefinitely. For these reasons, it is clear that Alternative 3 is the most viable and expedient alternative that will assure the long-term safety of the residents of the Carmel River Valley.

We find that this DEIR/S is adequate if and only if the Lead Agencies select Alternative 3 as the preferred alternative for the following reasons:

First, Alternative 3 should be the preferred alternative in the Final EIR/S because it is the best technical design and most expedient solution that assures the safety issues are resolved permanently.

Second, the Proponent's Proposed Project, dam thickening, runs the risk of drastic unintended consequences and will continue to compromise safety in the future as the dam structure continues to degrade over time, and will also result in cumulative impacts to the environment under the Endangered Species Act, the Clean Water Act, the Porter Cologne Water Quality Act, NEPA and CEQA. It would also most probably result in a Jeopardy Opinion by NOAA Fisheries and USFWS (Section 7 Consultation) delaying the project.

AS/O-31

Third, the river reroute and dam removal alternative provides a technically superior and viable solution in a shorter time frame than either notching or dam thickening, assuring that the risk to human life and impacts to federally designated "threatened" species are reduced or completely eliminated as soon as possible.

Fourth, the public has clearly voiced its support for the river rerouting and dam removal alternative as demonstrated by public comments at the DWR/USACOE public hearing for the Draft EIR/EIS held in Carmel Valley on May 23rd and reported in the media (see attachment, front page article "Carmel River reroute gets solid backing", Monterey Herald, May 24, 2006).

CSPA supports selection of Alternative 3, river reroute and dam removal, as the preferred alternative because it is the only one that *guarantees* a final solution for long-term safety and also protects the environment and reduces adverse impacts to water quality, and "threatened" steelhead and California red-legged frog.

GEN-39

Furthermore, we find that the Draft EIR/S fails to fully assess the impacts of the Proponent's Proposed Project (dam thickening), Alternative 1 (dam notching) or Alternative 2 (dam removal and transport of sediment to a nearby canyon), and therefore the Draft EIR/S is inadequate for selecting any of the other alternatives.

The Final EIR/EIS should also identify Alternative 3 as the Least Damaging Project Alternative. Alternative 3 removes the barrier to fish passage, maintains red legged frog habitat, and prevents uncontrolled release of accumulated sediment downstream.

NEPA/ CEQA-34

Both the Proponent's Proposed Project and the notching alternative would continue to have adverse impacts on fish passage. In addition the sluicing required for both of those alternatives would interfere with use of the fish ladder. Furthermore, both the PPP and the notching alternatives would lead to uncontrolled releases of accumulated sediments in high flow events. Therefore neither of these qualifies as the Least Environmentally Damaging Project Alternative.

AS/O-32

CSPA will actively support the selection and implementation of Alternative 3, and will also continue to advocate for support by interested groups in the community and throughout the state for implementation of Alternative 3.

Thank you,

Jim Crenshaw, President

July 3, 2006

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Dear Ms. Hatler and Mr. Smith:

San Clemente Dam Seismic Safety Project
Draft Environmental Impact Report/
Environmental Impact Statement
Monterey County

The Department of Fish and Game (DFG) has reviewed the Draft Environmental Impact Report/Statement (DEIR/S) and its appendices for the San Clemente Dam Seismic Safety Project. Our comments on the DEIR/S are based on our role as both trustee agency and responsible agency under the California Environmental Quality Act (CEQA), with additional permit authority under Section 1600 *et seq.* of Fish and Game Code, Lake and Streambed Alteration Agreements (SAA's). We are also participating in project review under the National Environmental Policy Act (NEPA), to provide input on the alternatives analysis. Our comments focus primarily on our concerns with the proponent's intent to repair the obsolete San Clemente Dam (Dam) and maintain the structure as a permanent impediment to natural fluvial processes and fish movement in the Carmel River watershed. We also describe the advantages of the fundamental opportunity still available to the project proponent to greatly improve this watershed by implementing what we deem to be the environmentally preferred option, Alternative 3, the Carmel River reroute with in-place sediment stabilization. The proponent's proposed project is currently dam strengthening with in-place sediment stabilization.

AL-14

AL-14

The impetus for the project is the requirement by the Division of Dam Safety (DSOD), which has been in place since 1995, for the Coastal Division of the California American Water Company (CAW) to bring the Dam into compliance with safety standards based on predictions of a Maximum Credible Earthquake (MCE) and a Probable Maximum Flood (PMF). It is important to note for the record that the dam no longer has any functional purpose in terms of traditional uses such as water storage or flood control, and that no assertions about such utility in the future are being made.

DFG consultation history

NEPA/ CEQA 26

Staff from the Central Coast Region of DFG have for many years provided CAW and DWR with input on various aspects of the management of aquatic resources in the Carmel River watershed. A primary concern has always been the viability of the Carmel River population of the steelhead trout, *Oncorhynchus mykiss*, which is in the South-Central California Coast (SCCC) Evolutionarily Significant Unit, designated by the National Marine Fisheries Services as Threatened. The steelhead is also a State Species of Special Concern. The California red-legged frog is another State Species of Special Concern, and is listed by the U.S. Fish and Wildlife Service as Threatened. DFG's concerns as a trustee agency for these and other riparian species in the Carmel River watershed have been largely focused on ensuring adequate instream flows and passage conditions in relation to CAW's water supply operations in Carmel Valley. This has included an ongoing need to ensure compliance with fish passage necessary over the Dam, by adequate maintenance and improvements of the existing fish ladder, as well as ensuring bypass flows and moderating drawdown regimens at the reservoir. We also provided input on earlier versions of the Draft EIR, prior to the inception of Alternative 3, which has evolved as a middle option between full dam removal and strengthening. In previous years DFG participated in "core group" meetings that dealt specifically with the DSOD order, DFG participation ceased due to staffing limitations. In December 2005, DWR requested DFG re-engagement in the process by reviewing the administrative draft of the DEIR/EIS. In response, DFG staff were redirected towards this effort and provided initial input to DWR, much of which will be repeated in this letter. However, DFG was not subsequently allowed to resume its participation in the core group process.

Overview: environmentally preferred alternative and potential effects to existing habitats

FI-99

DFG sees Dam strengthening as inherently problematic in terms of overall risk to riverine resources. The DEIR/EIS does an adequate job in providing documentation of passage at the Dam for the last several decades, but does not provide enough historical

context for what is now a tenuous condition of steelhead within the watershed. While it is true that steelhead observed in an evolving series of ladder counts have shown numbers as high as 1,400 between 1962 and the mid-seventies (and as low as 15 in 1992), the key management context for the population overall is that it is currently below 5% of known historic estimates. As such, its numbers are low enough to be at risk of local extinction. Any actions DFG takes in this setting, such as voicing its opinion in the public comment process, or developing resource protection measures through the SAA process, must consider these parameters. The DFG position is that making the dam to a permanent fixture in the watershed for the foreseeable future is to exacerbate local extinction risk. While the proposed improvements to the fish ladder, viewed in isolation from the prospects of the Carmel River population, should improve passage success, they cannot compare with the positive effects of replacing the ladder with natural passage. Even the best functioning ladders will impede passage, at rates currently documented between 5% and 40% for anadromous fish. Fallback and delay, effects on reproductive success due to increased stress, hesitation at entrance pools and kelt mortality are among the known factors associated with ladders that can only reduce overall recruitment to the population.

FI-99

Herptile habitat within the San Clemente Reservoir will be impacted by any of the four alternatives, and adverse effects on habitat and populations will be expected for California red-legged frogs, western pond turtles and Coast Range newts (all are California State Species of Special Concern). The mitigation regimen proposed for these impacts (Table 2.1) would be acceptable for SAA purposes if dam removal is implemented. It needs to be noted that, if retained, the reservoir habitat represents a management challenge relative to these species, since it will need to exist in a state of perpetual disturbance due to the requirements of sluicing, dredging and bullfrog control. Although there will be a short-term series of population reductions and habitat impacts during dam removal operations, DFG considers these to be sufficiently mitigated by the long-term benefit of riverine restoration with dam removal. Alternatively (in the case of dam retention), loss of known acreages of breeding habitat for California red-legged frogs will need to be mitigated in-kind above and beyond the avoidance and translocation plans currently proposed, as conditions to be determined in the SAA process.

TE-33

Project baseline

The current condition of the watershed, with the Dam and fish ladder present, is arguably the existing baseline as defined in CEQA An improved ladder cannot possibly be viewed as a potentially adverse effect from a biological perspective. The obvious effect of the Dam on downstream channel morphology, by retaining sediment which leads to channel instability, incision and bank erosion, lack of spawnable gravel below

NEPA/
CEQA 27

NEPA/ CEQA 27

the Dam and possible lack of sediment into the Carmel Lagoon, should be considered as part of the CEQA baseline.

Unavoidable impacts and the need for subsequent mitigations

FI-100

Squarely outside of the baseline is the impact of the new proposed sluicing regimen that will be necessary in perpetuity to periodically move significant tonnages of accumulated sediment from behind the dam into the incised river corridor below it. Due to time and staffing constraints, DFG can not comment extensively on the specific details of its concerns on the Draft Plan prepared to date (Appendix J). We have instead coordinated with the National Marine Fisheries Service (NMFS) in recent months and concur with the analyses presented in their comment letter on this specific issue. The most important and basic aspect of the sluicing regimen is that it will be, along with the ladder, at the very minimum be a chronic stressor on the steelhead population. Furthermore, passage through the reservoir is likely to be poorer (higher water temperature, decreased cover, increased predation) in perpetuity with the sluicing regimen than it was in a deeper reservoir just a few years ago (and certainly inferior to a re-naturalized river reach).

FI-101
SED-57

As presented in Appendix J, sluicing operations are untested and lack specificity. They are based on migration records and behavioral observations of an already residual run and do not attempt to model the population recovery that the resource agencies believe should be a primary objective of the project. They do offer an interesting projection based on admittedly the most accessible, rather than effective, data collection methods (e.g. the use of the Robles Del Rio gage 5 miles downstream of the dam rather than the Sleepy Hollow gage). While the plan strives to identify permutations that would minimize the concurrence of sluicing and migration, the complexity of variables appropriately identified in the "Proposed Sluicing Decision Tree" (Figure 3) belies the inherent difficulty in juxtaposing the need to remove sediment from the reservoir and improve fish passage. The draft plan appears to fail to consider in detail predictable outliers to watershed conditions experienced from 1994-2005, such as fire, drought or prolonged heavier flows, which would alter debris loading, sediment particle-size distributions and vegetative encroachment in the reservoir. The adaptive management aspect of the plan appears to be traditional dredging that would occur at the upstream end of the fish ladder "on average every three years." If heavy storms and high flows are prevalent, this dredging would be precluded, making historically productive wet years the most impacted.

FI-101
SED-57

The experience of the last two decades with maintenance issues at the fish ladder amply illustrate the difficulties in achieving resource management priorities particularly during storm events. We are confident that CAW will do their best to comply with all aspects of the Sluicing Operations and Maintenance Plan that is still to be developed, but are concerned that the full implications of the can be fully understood so must be evaluated as an unknown. By design, sluicing will need to happen more or less concurrently with the adult migration of steelhead in the Carmel River. The document correctly identifies the impacts of the sluicing to fisheries and water quality as significant and unavoidable (Table 2.1, Impacts FI-9 and WQ-14).

Current and future DFG oversight and project timelines

NEPA/
CEQA 28

In the SAA process, the sluicing plan would have to be fully developed and mitigated before a SAA could be executed. Until the sluicing impacts are more thoroughly quantified, we cannot provide the range of mitigations that would be sufficient; this will need to be done through the SAA process. In contrast, the impacts of dam removal options are more quantifiable and would require less extensive mitigations.

NEPA/
CEQA 29

The strengthening of the dam within the watershed will require the regulatory agencies to perpetually exert a heightened level of oversight to the dam than what would be necessary if Alternatives 2 or 3 are ultimately selected. All four alternatives will entail impacts to the river during construction or implementation, but the impacts from the sluicing regimen and passage impediment initiated and maintained by the preferred project will continue in perpetuity. Because of this difference in the scope of impacts, DFG will be forced to modulate the impacts for the proposed project over a greater period of time. If there is no ultimate large benefit from the project, we would seek to minimize the temporal impacts to the river corridor and would likely restrict work within the river zone to periods that will most likely be between June 15 and October 15. This may be further restricted by high spring flows or early rains. In contrast, if the net effect of the project is beneficial, i.e. dam removal, it would provide a rationae for an accelerated schedule, with a possibly higher short-term risk to resources that is mitigated by an earlier capture of a significant resource benefit. This could allow completion of a dam removal option in a shorter time frame than the preferred alternative.

GEN-21

Another parameter of aquatic resource management that may be affected by the choice of alternatives is the ongoing process by which CAW complies with Order 95-10 by the State Water Resources Control Board (SWRCB) (subsequently supplanted by Order 2002-02). This Order occurred due to complaints filed by DFG and others which

successfully argued that CAW diversion of waters were having an illegal and adverse effect on the public trust resources of the river. To date, DFG has participated in helping aid attain compliance with the Order by negotiating a Memorandum of Understanding (MOU) on an annual basis that regulates the bypass flows past the Dam. In the future it will be necessary for DFG to bring CAW into a more standard form of compliance through the use of the more thorough SAA process that is consistent with Section 1600 of the DFG Code. The condition of steelhead in the Carmel River will diminish or improve over time, partially in response to the presence or absence of the Dam. If the population continues its general trend of decline, it will force the resource agencies to expend greater efforts and regulatory oversight on the remaining fish and wildlife resources in the Carmel River in regulatory processes such as the ongoing Order 2002-02. The project Operator should anticipate this eventuality and consider it in any long-term cost-benefit analyses they conduct. The increased scrutiny that will need to be paid to the management of steelhead as a result of the retention of the Dam may, over the years, end up placing a greater burden on CAW than the investment that could be made in the short run to effect Alternative 3.

GEN-21

Logistical considerations

Finally, DFG hopes that the CEQA and NEPA Lead Agencies have fully and responsibly considered the fact that the cost differential between the proposed project and removal alternatives, in particular Alternative 3, may not have to be fully borne by CAW. We hope that an economically based statement of overriding considerations will not be considered until a thorough review of potential and existing funding sources occurs. Resource agencies are well aware of the historic opportunity to restore a significant portion of the Carmel River watershed, and it is highly likely that they can assist CAW identifying funding support to offset the additional cost for dam removal. For its part, DFG understands DWR's interest in eliminating the risk to the public in a timely manner, and would be willing to assist within its means to facilitate efforts for obtaining funds without jeopardizing project momentum. We would also recommend that CAW note that DFG administers a Fisheries Restoration Grant Program (FRGP), and that a dam removal project of this nature would be eligible for funding (although it should be noted that FRGP grants are typically not large enough to cover more than a portion of the overall expense of a project of this scope). Perhaps more significantly, DFG provides input to other funding bodies, and could be counted on for support if and when dam removal becomes an option. The next deadline for FRGP grant proposals is in March 2007 for funds to be disbursed in 2008. We would also consider providing technical support for reducing any remaining uncertainties with finalizing designs for dam removal and or river re-route.

CR-5

GEN-22

We have noted that there were some moderate ambiguities and unresolved issues in the description of Alternative 3, but have not addressed them in this letter (e.g. a curious absence of reference to the growing knowledge base pertaining to dam removal in the United States).

NEPA/ CEQA 30

Please be advised this project will result in changes to fish and wildlife resources as described in the California Code of Regulations, Title 14, Section 753.5(d)(1)(A)-(G) . An environmental filing fee as required under Fish and Game Code Section 711.4(d) should be paid to the Monterey County Clerk on or before filing of the Notice of Determination for this project.

If you have comments or questions regarding this letter, please contact Serge Glushkoff, Environmental Scientist, at (707) 944-5597 or SGlushkoff@dfg.ca.gov; or Scott Wilson, Habitat Conservation Supervisor, at (707) 944-5584

Sincerely,

Original Signed by C. Catalano for

Robert W. Floerke
Regional Manager
Central Coast Region

cc: See next page

CARMEL RIVER STEELHEAD ASSOCIATION
P.O. BOX 1183 • MONTEREY, CALIFORNIA 93940

SAN CLEMENTE DAM SEISMIC RETROFIT PROJECT

Comments on San Clemente Environmental Impact Report:

There are many dams in California that will soon be as worthless as San Clemente. The division of safety of dams, as well as the rest of responsible agencies of government, need to learn how to safely and cheaply remove dams and restore the function of their streams and rivers, including rapid restoring of historic bed-load throughout the riverine system.

San Clemente Dam should be removed. It is on a navigable stream. It is unsafe and virtually useless. The public has a legal right to boat and otherwise recreate on this part of the Carmel River and any attempt to buttress or maintain San Clemente or the old Carmel Dam needs to consider the interference of recreational values on this part of the river.

REC-5

It is obvious from review of the EIR that a 10ft. diameter sluice gate operated as described in the operational plan will not protect threatened steelhead from "take" (death of a critical part of the population hindering recovery and leading to further decline toward extinction).

FI-111

The 10ft. gate is too small to have the desired sediment management effect and allow safe passage. It has a narrow window of effectiveness. It would not operate well at flows above 600 cfs. because of backwater effects. Timing of operation is critical and costs of keeping a gate operator and a fish ladder operator present doesn't seem realistic knowing how dams have been operated in this state. Many times the debris and sediment flows will clog and jam this small sluice gate as well as the fish ladder. The expense and disruption of shutting down and shoveling out the 60 plus bays of the fish ladder multiple times during wet years, has not been evaluated.

FI-111

The fact that steelhead frequently restart their migration on the rising limb of the hydrograph makes any operation of a sluice gate likely to wash back and probably kill migrating Steelhead resting in the reservoir or pooling below the dam. A "take" (the death of a critical part of the population hindering recovery and leading to further decline toward extinction) of threatened species would be expected.

I have contacted fish passage experts in Alaska, Washington, Oregon and California and could find no one who knew of a fish ladder functioning successfully on a reservoir that is 90% full of sediment. Even light sediment will tend to settle in the calm resting areas designed into a fish ladder, disrupting or blocking passage.

SED-66 The EIR mentioned that there might be a temptation to reduce the flow to the fish ladder thereby reducing the need for more frequent sluicing. This would have a negative effect on fish passage. Large sediment sluiced to the plunge pool may pile up and block access to the fish ladder. This possibility was not examined.

GEN-40 The fish ladder on the old Carmel River Dam is located on the south end not the north.

SED-67 Sediment removed from San Clemente should be available for sorting and reintroduction into the Carmel River for river habitat, bank stabilization, and beach nourishment. Sediment storage that allows for mitigation of the long term damage caused by the dam should be considered in all options.

FI-112 Any new diversion point, or old one for that matter, needs to have a properly sized, durable and functioning fish screen.

AA-80 Any sediment storage should be done in as natural a way as possible with the least amount of Geo-grid and concrete, while appreciating the possibility of earthquakes.

HY-17 The hydraulics of putting a river into a creek channel needs analysis, not only channel width and depth needs consideration but the number and sharpness of bends are a concern. The Carmel River carries heavy loads of wood at times. We don't need a log jam dam.

TE-38 The frogs that inhabit the San Clemente flood plain have taken advantage of a man made situation. One can build new depressions in the stored sediment and line them with Hypolon, thus maintaining some of this flood plain frog habitat.

CONCLUSION:

FI-113

It is very important to understand that there are no areas of the Carmel River or its tributaries below San Clemente Dam that have spawning habitat and perennial flow. This means that if San Clemente fish ladder does not function, the offspring of steelhead forced to spawn on the suitable habitat will be dried up and lost. To put it simply a failed retrofit will cause the extinction of steelhead on the Carmel River.

NEPA/ CEQA-35

The impact report determined that all options had the same basic impact. We believe that this is not so and that leaving the dam in place has multiple impacts that would hinder recovery and lead to extinction over time.

AS/O-33

San Clemente Dam must be completely removed. Any options involving sluice gates and fish ladders will "take" (death of a critical part of the population hindering recovery leading to further decline and toward extinction) of steelhead. The long term costs, i.e. forever of operation, maintenance, management and liability of a semi-abandoned dam are huge. The risk of earthquakes and flood liability still remain. The only civilized and sane option is complete removal.

Roy Thurman Does

CRSA.

United State of America
Before the US Army Corps of Engineers
State of California
Before the California Department of Water Resources

San Clemente Dam Seismic Retrofit Project

Carmel River Watershed, California

In the Matter of Draft Environmental Impact Report and Environmental Impact Statement by the California Department of Water Resources and the United States Army Corps of Engineers

Comments by the Carmel River Steelhead Association

The California Department of Water Resources and the United States Army Corps of Engineers have prepared a draft Environmental Impact Report and Environmental Impact Statement for the proposed San Clemente Dam Seismic Retrofit Project. The deadline date for submitting comments is July 3, 2006.

The Carmel River Steelhead Association have been involved in conducting on-site rescue activities in the protecting federally listed steelhead trout in the Carmel River Watershed for the past 20 years or more. The Carmel River Steelhead Association has also been heavily involved with state and federal agencies for many years attempting to secure mitigation and protection measures to protect the people's public trust steelhead trout resources of the Carmel River and its tributaries. Consequently the Carmel River Steelhead Association has significant standing in the protection of the people's steelhead trout resources of the Carmel River Watershed.

The Carmel River Steelhead Association has reviewed the draft EIR/EIS for the proposed project. The following are the comments of the Carmel River Steelhead Association:

Alternatives – Remove the San Clemente Dam

AL-35
GEN-41

One of the most reasonable alternatives that should have been included in the draft EIR/EIS under CEQA is the removal of San Clemente Dam because the dam is an obstruction to the navigable waters of the Carmel River. Secondly, when a dam owner builds a dam on a public waterway, it should be understood that the dam would be removed from the public waterway when the dam becomes obsolete. In the case of the San Clemente Dam, it was built in 1921 and the reservoir has become filled with sediment. The San Clemente Dam and Reservoir is obsolete. It is unreasonable and not in the public interest for any dam owner or water diverter in California to built a dam and not be responsible for it when the dam's life has ended. The duty and responsibility of the removal of the San Clemente Dam is that of Cal-American Water Company, and not that of the public or public agencies.

NEPA/ CEQA-36

Consequently, the EIR/EIS is deficient because the document failed to disclose, evaluate, and include the removal of the San Clemente Dam as a reasonable alternative that would be in the public interest and reopen the navigability of the river for fish and boating.

Removal of Sediment From San Clemente Reservoir and Dam

SED-68

Slucing sediment downstream in the Carmel River adversely affects water quality, steelhead habitat, macro invertebrate habitat, other aquatic resources, et al. California-American Water Company must comply with state water quality statutes in California like every other citizen and party. The sluicing of sediment from San Clemente Reservoir and Dam into the Carmel River must be prohibited at all times by the US Army Corps of Engineers, State Regional Water Quality Control Board, State Water Resources Control Board, Department of Fish and Game, NOAA Fisheries et al. Cal-American Water Company must remove all sediment by mechanical methodologies to protect the federally protected steelhead trout and their habitat, aquatic environment and water quality of the Carmel River below the San Clemente Dam to the Pacific Ocean, including the Carmel River Lagoon.

Fish Ladder

FI-114

San Clemente Dam has a fish ladder. However, the draft EIR/EIS did not include data and information that the fish ladder allows for steelhead trout species to effectively use the fish ladder and migrate upstream safety at all times when the reservoir is choked with sediment.

Discovery work conducted by the Carmel River Steelhead Association shows that fish ladder on reservoirs that are filled with sediment do not work effectively because the fish ladder becomes choked with sediment and becomes non-operational for fish passage.

FI-115

The draft EIR/EIS must include data and information that shows the fish ladder was effectively working and allowed all steelhead trout species to migrate safety upstream to spawning and rearing habitat in the upper Carmel River. Consequently, there must be evidence in the draft EIR/EIS that provides proof to the public that the fish ladder provided passage at all times and allowed for safe passage of all federal protected steelhead trout to the upper river when the reservoir is filled with sediment.

Case law provides for monitoring under CEQA. The draft EIR/EIS must include a Steelhead Ladder Monitoring Plan for the fish ladder during the post project period for the life of the project so that the public can be assured the fish ladder is working at all times and that the fish ladder is allowing safe passage for steelhead to migrate upstream above the dam. However, if the most reasonable alternative was selected and the dam was removed, the defective fish ladder would not be necessary.

Downstream Recruitment of Spawning Gravel

FI-116
SED-9

It is well known that dams prevent the downstream recruitment of spawning gravels for downstream spawning of resident and anadromous fisheries. In this case the San Clemente Dam is preventing the downstream recruitment of spawning gravel in a significant large portion of the streambed of the Carmel River that has adverse impacts to spawning habitat of federally protected steelhead trout species in the lower Carmel River.

NEPA/
CEQA-37

CEQA requires mitigation measures that would prevent the dam from obstructing the downstream recruitment of spawning habitat. CEQA does not allow for trade offs.

NEPA/
CEQA-38

Removal of the San Clemente Dam would prevent the obstruction of the downstream recruitment of spawning gravel for federally protected steelhead trout that would allow steelhead trout to spawn in the lower Carmel River. However that reasonable alternative was not disclosed and included in the draft EIR/EIS as an alternative because the draft EIR/EIS placed Cal-American Water Company finances above the protection of the people's public trust steelhead resources. That solution may be applicable with NEPA, but CEQA requires the protection of the steelhead with no tradeoffs. We reference the provisions of the California Environmental Quality Act and its Guidelines.

FI-117
SED-70

The draft EIR/EIS must include a Steelhead Trout Gravel Recruitment Plan for the lower Carmel River below San Clemente Dam in the event the removal of the dam is not ordered by any regulatory state and federal agency.

Water Rights

WAT-14

The water right permit(s) that allows Cal-American to store and divert water from San Clemente Dam and Reservoir must be cancelled or amended by the State Water Resources Control Board because San Clemente Dam is not being operated as it has in the past because of the failure of the dam to store the state's water. The California State Water Resources Control Board is the authority in water rights matters and not the Department of Water Resources, the Army Corp of Engineers, or Cal –American Water Company. This water rights matter must be disclosed, discussed, and mitigated in the final EIR/EIS.

Cumulative Impacts

NEPA/
CEQA-39

The draft EIR/EIS under CEQA must include a Cumulative Impacts Analysis that discloses, evaluates, and mitigates all of the cumulative effects to federally protected Steelhead Trout and their habitat in the Carmel River resulting from the San Clemente Dam and all other diversions by Cal-American Water Company.

The draft EIR/EIS does not include a cumulative impacts analysis of the cumulative effects to federally protected steelhead trout and their habitat in the Carmel River Watershed resulting from Cal-American's diversions of the state's waters of the Carmel River Watershed (Surface diversions and underflow diversions).

"A draft EIR must discuss "cumulative impacts" when they are significant. And even when they are not deemed significant, document should explain the basis for that conclusion. (Citizens to Preserve the Ojai v. County of Ventura (2d Dist. 1985) 176 Cal.App.3d 421, 432 [222 cal.Rptr. 247].)"

""Cumulative Impacts" are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." "Individual effects may be changes resulting from a single project or a number of separate project." "The cumulative impacts from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonable foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period if time." See CEQA Guidelines. NEPA sometimes equate "cumulative effects" with "synergistic effects." (City of Tenakee Springs v. Clough (9th Cir. 1990) 915 F.2d 1308, 1312; Sierra Club v. Penfold (9th Cir. 1988) 857 F.2d 1307, 1320-1321; and Natural Resources Defense Council v. Administrator (D.D.C. 1978) 451 F.Supp. 1245, 1258.)"

"A legally adequate "cumulative impact analysis" thus is an analysis of a particular project viewed over time and in conjunction with other related past, present, and reasonably foreseeable probable future projects whose impacts might compound or interrelate with those of the project at hand. Such an analysis "assesses cumulative damage as a whole greater than the sum of its parts." (Environmental Protection Information Center v. Johnson (1st Dist. 1985) 170 Cal.App.3d 604, 625 {216 Cal.Rptr. 502].) "Such an analysis is necessary because "' [t]he full environmental impact of a proposed.....action cannot be gauged in a vacuum."' (Whitman v. Board of Supervisors (2d Dist. 1979) 88 Cal.App.3d 397, 408 [15] Cal. Rptr. 866], quoting Akers v. Resor (W.D. Tenn. 1978) 443 F.Supp. 1355, 1360.) "' [A]n agency may not.....[treat] a project as an isolated 'single shot' venture in the face of persuasive evidence that it is but one of several substantially similar operations.....To ignore the prospective cumulative harm under such circumstances could be to risk ecological disaster."' (Whitman, supra, 88 Cal.App.3d at 408 [15] Cal. Rptr. 866], quoting Natural Resources Defense Council v. Callaway (2d Cir. 1975) 524 F.2d 79, 88.)"

NEPA/
CEQA-39

" Unless cumulative impacts are analyzed, agencies tend to commit resources to a course of action before understanding its long-term impacts. Thus, a proper cumulative analysis must be prepared "before a project gains irreversible momentum." (City of Antioch v. City Council (1st Dist 1986) 187 Cal.App.3d 1325, 1333 [232 Cal. Rptr. 507], citing Bozung v. Local Agency Formation Commission (1975) 13 Cal.3d 263, 282 [118 Cal. Rptr. 249].)"

"One court has described as follows the danger of approving projects without first preparing adequate cumulative impact analyses:"

" The purpose of this requirement is obvious: consideration of the effects of a project or projects as if no others existed would encourage the piecemeal approval of several

projects that, taken together, could overwhelm infrastructure and viral community services. This would effectively defeat CEQA's mandate to review the actual effects of the projects upon the environment. (Las Virgenes Homeowners Federation, Inc. v. County of Los Angeles (2d Dist. 1986) 177 Cal.App.3d 300, 306 [233 Cal Rptr. 7611].)."

"[I]t is vitally important that an EIR avoid minimizing the cumulative impacts. Rather, it must reflect a conscientious effect to provide public agencies and the general public with adequate and relevant detailed information about them. A cumulative impact analysis, which understates information concerning the severity and significance of cumulative impacts impedes meaningful public discussion and skews the decision maker's perspective concerning the environmental consequences of a project, the necessity for mitigation measures, and the appropriateness of project approval. An inadequate cumulative impact analysis does not demonstrate to an apprehensive citizenry that the governmental consequences of its action. (176 Cal.App.3d at 431 [222 Cal. Rptr. 2471, quoting San Franciscans for Reasonable Growth v. City and County of San Francisco ("SFRG 1") (1st Dist. 1984) 151 Cal.App.3d 61, 79 [198 Cal Rptr. 634].)"

NEPA/
CEQA-39

The Carmel River Steelhead Association requests the Department of Water Resources to follow the law under CEQA and prepare a Cumulative Impacy Analysis and include that cumulative impact analysis in the final EIR/EIS.

Carmel River Steelhead Management Plan

The San Clemente Dam obstructs the navigable waters of the Carmel River for fish and public boating. Clearly Cal-American has a public duty to protect federally listed steelhead trout in the Carmel River from it's water diversions from the Carmel River Watershed. Consequently it would be reasonable, in the public interest, and in the best interest of the federally protected Steelhead Trout to require Cal-American Water Company to prepare a Carmel River Steelhead Plan that would significantly improve the steelhead resources in the Carmel River Watershed to the Pacific Ocean, including the Carmel River Lagoon. Said Management Plan must be included in the final EIR/EIS.

FI-118

Thank you for the opportunity to submit comments. A hard copy of the final EIR/EIS would be appreciated Please forward to Dr. Roy Thomas and Bob Baiocchi at the addresses shown below.

Respectfully Submitted

Bob Baiocchi
For: Carmel River Steelhead Association
P.O. Box 1790
Graeagle, CA 96103
E-Mail Address: baiocchi@psln.com

Dated: June 28, 2006

cc: Ms. Charyce Hatler
California Department of Water Resources
San Joaquin District
3374 East Shields Avenue
Fresno, CA 93726

Mr. Robert Smith
Project Manager
US Army Corps of Engineers
333 Market Street
San Francisco, CA 94105

Dr. Roy Thomas
Carmel River Steelhead Association
26535 Carmel Rancho Blvd.
Carmel, CA 93923

Mr. Steve Edmondson, Supervisor
NOAA Fisheries
Via E-Mail

Mr. Michael Aceituno, Supervisor
NOAA Fisheries
Via E-Mail

Interested Parties (Via E-Mail bcc)

2)

Carmel Valley Association P.O.
Box 157 Carmel CA 93924

June 21, *2006*

US Army Corps of Engineers
San Francisco District
Attn: Robert Smith
333 Market St., 5th floor
San Francisco CA, 94105-2197

Dear Mr. Smith:

San Clemente Dam - Draft EIS

The Carmel Valley Association, with over 800 members resident in Carmel Valley, has the following comments on the DEIS:

AA-11

1) The major reason for this study is the potential damage to the dam by an earthquake. However, under Alternative #3, with the dam removed and the Carmel River diverted into San Clemente Creek, the mass of sediment now behind the dam would be left as a free-standing block. A major earthquake could surely destabilize and set in motion this mass of sediment, more easily than under the No Action alternative. The EIS needs to address this contingency.

SED-5

3) The mass of sediment behind the dam, accumulated over many years, may contain toxic materials. When this sediment is moved or disturbed during the project, such toxics could contaminate Cal-Am's municipal water supplies.

We recommend a program to drill and sample the sediment pile to evaluate the possibility of such contamination.

Thankyouforyourattenilon,
'irector, CV A

Robert Greenwood

Robert Greenwood, D

July 3, 2006

Charyce Hatler
Department of Water Resources
San Joaquin District
Fresno CA 93726-6913
Email: chatler@water.ca.gov

Bob Smith
U.S. Army Corps of Engineers
San Francisco District
333 Market Street, 8th Floor
San Francisco, CA 94105-2107
Email: Robert.f.smith@usace.army.mil

Dear Ms. Hatler and Mr. Smith:

San Clemente Dam Seismic Safety Project
Draft Environmental Impact Report/
Environmental Impact Statement
Monterey County

The Department of Fish and Game (DFG) has reviewed the Draft Environmental Impact Report/Statement (DEIR/S) and its appendices for the San Clemente Dam Seismic Safety Project. Our comments on the DEIR/S are based on our role as both trustee agency and responsible agency under the California Environmental Quality Act (CEQA), with additional permit authority under Section 1600 *et seq.* of Fish and Game Code, Lake and Streambed Alteration Agreements (SAA's). We are also participating in project review under the National Environmental Policy Act (NEPA), to provide input on the alternatives analysis. Our comments focus primarily on our concerns with the proponent's intent to repair the obsolete San Clemente Dam (Dam) and maintain the structure as a permanent impediment to natural fluvial processes and fish movement in the Carmel River watershed. We also describe the advantages of the fundamental opportunity still available to the project proponent to greatly improve this watershed by implementing what we deem to be the environmentally preferred option, Alternative 3, the Carmel River reroute with in-place sediment stabilization. The proponent's proposed project is currently dam strengthening with in-place sediment stabilization.

AL-14

AL-14

The impetus for the project is the requirement by the Division of Dam Safety (DSOD), which has been in place since 1995, for the Coastal Division of the California American Water Company (CAW) to bring the Dam into compliance with safety standards based on predictions of a Maximum Credible Earthquake (MCE) and a Probable Maximum Flood (PMF). It is important to note for the record that the dam no longer has any functional purpose in terms of traditional uses such as water storage or flood control, and that no assertions about such utility in the future are being made.

DFG consultation history

NEPA/ CEQA 26

Staff from the Central Coast Region of DFG have for many years provided CAW and DWR with input on various aspects of the management of aquatic resources in the Carmel River watershed. A primary concern has always been the viability of the Carmel River population of the steelhead trout, *Oncorhynchus mykiss*, which is in the South-Central California Coast (SCCC) Evolutionarily Significant Unit, designated by the National Marine Fisheries Services as Threatened. The steelhead is also a State Species of Special Concern. The California red-legged frog is another State Species of Special Concern, and is listed by the U.S. Fish and Wildlife Service as Threatened. DFG's concerns as a trustee agency for these and other riparian species in the Carmel River watershed have been largely focused on ensuring adequate instream flows and passage conditions in relation to CAW's water supply operations in Carmel Valley. This has included an ongoing need to ensure compliance with fish passage necessary over the Dam, by adequate maintenance and improvements of the existing fish ladder, as well as ensuring bypass flows and moderating drawdown regimens at the reservoir. We also provided input on earlier versions of the Draft EIR, prior to the inception of Alternative 3, which has evolved as a middle option between full dam removal and strengthening. In previous years DFG participated in "core group" meetings that dealt specifically with the DSOD order, DFG participation ceased due to staffing limitations. In December 2005, DWR requested DFG re-engagement in the process by reviewing the administrative draft of the DEIR/EIS. In response, DFG staff were redirected towards this effort and provided initial input to DWR, much of which will be repeated in this letter. However, DFG was not subsequently allowed to resume its participation in the core group process.

Overview: environmentally preferred alternative and potential effects to existing habitats

FI-99

DFG sees Dam strengthening as inherently problematic in terms of overall risk to riverine resources. The DEIR/EIS does an adequate job in providing documentation of passage at the Dam for the last several decades, but does not provide enough historical

context for what is now a tenuous condition of steelhead within the watershed. While it is true that steelhead observed in an evolving series of ladder counts have shown numbers as high as 1,400 between 1962 and the mid-seventies (and as low as 15 in 1992), the key management context for the population overall is that it is currently below 5% of known historic estimates. As such, its numbers are low enough to be at risk of local extinction. Any actions DFG takes in this setting, such as voicing its opinion in the public comment process, or developing resource protection measures through the SAA process, must consider these parameters. The DFG position is that making the dam to a permanent fixture in the watershed for the foreseeable future is to exacerbate local extinction risk. While the proposed improvements to the fish ladder, viewed in isolation from the prospects of the Carmel River population, should improve passage success, they cannot compare with the positive effects of replacing the ladder with natural passage. Even the best functioning ladders will impede passage, at rates currently documented between 5% and 40% for anadromous fish. Fallback and delay, effects on reproductive success due to increased stress, hesitation at entrance pools and kelt mortality are among the known factors associated with ladders that can only reduce overall recruitment to the population.

FI-99

Herptile habitat within the San Clemente Reservoir will be impacted by any of the four alternatives, and adverse effects on habitat and populations will be expected for California red-legged frogs, western pond turtles and Coast Range newts (all are California State Species of Special Concern). The mitigation regimen proposed for these impacts (Table 2.1) would be acceptable for SAA purposes if dam removal is implemented. It needs to be noted that, if retained, the reservoir habitat represents a management challenge relative to these species, since it will need to exist in a state of perpetual disturbance due to the requirements of sluicing, dredging and bullfrog control. Although there will be a short-term series of population reductions and habitat impacts during dam removal operations, DFG considers these to be sufficiently mitigated by the long-term benefit of riverine restoration with dam removal. Alternatively (in the case of dam retention), loss of known acreages of breeding habitat for California red-legged frogs will need to be mitigated in-kind above and beyond the avoidance and translocation plans currently proposed, as conditions to be determined in the SAA process.

TE-33

Project baseline

The current condition of the watershed, with the Dam and fish ladder present, is arguably the existing baseline as defined in CEQA An improved ladder cannot possibly be viewed as a potentially adverse effect from a biological perspective. The obvious effect of the Dam on downstream channel morphology, by retaining sediment which leads to channel instability, incision and bank erosion, lack of spawnable gravel below

NEPA/
CEQA 27

NEPA/ CEQA 27 the Dam and possible lack of sediment into the Carmel Lagoon, should be considered as part of the CEQA baseline.

Unavoidable impacts and the need for subsequent mitigations

Squarely outside of the baseline is the impact of the new proposed sluicing regimen that will be necessary in perpetuity to periodically move significant tonnages of accumulated sediment from behind the dam into the incised river corridor below it. Due to time and staffing constraints, DFG can not comment extensively on the specific details of its concerns on the Draft Plan prepared to date (Appendix J). We have instead coordinated with the National Marine Fisheries Service (NMFS) in recent months and concur with the analyses presented in their comment letter on this specific issue. The most important and basic aspect of the sluicing regimen is that it will be, along with the ladder, at the very minimum be a chronic stressor on the steelhead population. Furthermore, passage through the reservoir is likely to be poorer (higher water temperature, decreased cover, increased predation) in perpetuity with the sluicing regimen than it was in a deeper reservoir just a few years ago (and certainly inferior to a re-naturalized river reach).

FI-100

As presented in Appendix J, sluicing operations are untested and lack specificity. They are based on migration records and behavioral observations of an already residual run and do not attempt to model the population recovery that the resource agencies believe should be a primary objective of the project. They do offer an interesting projection based on admittedly the most accessible, rather than effective, data collection methods (e.g. the use of the Robles Del Rio gage 5 miles downstream of the dam rather than the Sleepy Hollow gage). While the plan strives to identify permutations that would minimize the concurrence of sluicing and migration, the complexity of variables appropriately identified in the "Proposed Sluicing Decision Tree" (Figure 3) belies the inherent difficulty in juxtaposing the need to remove sediment from the reservoir and improve fish passage. The draft plan appears to fail to consider in detail predictable outliers to watershed conditions experienced from 1994-2005, such as fire, drought or prolonged heavier flows, which would alter debris loading, sediment particle-size distributions and vegetative encroachment in the reservoir. The adaptive management aspect of the plan appears to be traditional dredging that would occur at the upstream end of the fish ladder "on average every three years." If heavy storms and high flows are prevalent, this dredging would be precluded, making historically productive wet years the most impacted.

FI-101
SED-57

FI-101
SED-57

The experience of the last two decades with maintenance issues at the fish ladder amply illustrate the difficulties in achieving resource management priorities particularly during storm events. We are confident that CAW will do their best to comply with all aspects of the Sluicing Operations and Maintenance Plan that is still to be developed, but are concerned that the full implications of the can be fully understood so must be evaluated as an unknown. By design, sluicing will need to happen more or less concurrently with the adult migration of steelhead in the Carmel River. The document correctly identifies the impacts of the sluicing to fisheries and water quality as significant and unavoidable (Table 2.1, Impacts FI-9 and WQ-14).

Current and future DFG oversight and project timelines

NEPA/
CEQA 28

In the SAA process, the sluicing plan would have to be fully developed and mitigated before a SAA could be executed. Until the sluicing impacts are more thoroughly quantified, we cannot provide the range of mitigations that would be sufficient; this will need to be done through the SAA process. In contrast, the impacts of dam removal options are more quantifiable and would require less extensive mitigations.

NEPA/
CEQA 29

The strengthening of the dam within the watershed will require the regulatory agencies to perpetually exert a heightened level of oversight to the dam than what would be necessary if Alternatives 2 or 3 are ultimately selected. All four alternatives will entail impacts to the river during construction or implementation, but the impacts from the sluicing regimen and passage impediment initiated and maintained by the preferred project will continue in perpetuity. Because of this difference in the scope of impacts, DFG will be forced to modulate the impacts for the proposed project over a greater period of time. If there is no ultimate large benefit from the project, we would seek to minimize the temporal impacts to the river corridor and would likely restrict work within the river zone to periods that will most likely be between June 15 and October 15. This may be further restricted by high spring flows or early rains. In contrast, if the net effect of the project is beneficial, i.e. dam removal, it would provide a rationae for an accelerated schedule, with a possibly higher short-term risk to resources that is mitigated by an earlier capture of a significant resource benefit. This could allow completion of a dam removal option in a shorter time frame than the preferred alternative.

GEN-21

Another parameter of aquatic resource management that may be affected by the choice of alternatives is the ongoing process by which CAW complies with Order 95-10 by the State Water Resources Control Board (SWRCB) (subsequently supplanted by Order 2002-02). This Order occurred due to complaints filed by DFG and others which

successfully argued that CAW diversion of waters were having an illegal and adverse effect on the public trust resources of the river. To date, DFG has participated in helping aid attain compliance with the Order by negotiating a Memorandum of Understanding (MOU) on an annual basis that regulates the bypass flows past the Dam. In the future it will be necessary for DFG to bring CAW into a more standard form of compliance through the use of the more thorough SAA process that is consistent with Section 1600 of the DFG Code. The condition of steelhead in the Carmel River will diminish or improve over time, partially in response to the presence or absence of the Dam. If the population continues its general trend of decline, it will force the resource agencies to expend greater efforts and regulatory oversight on the remaining fish and wildlife resources in the Carmel River in regulatory processes such as the ongoing Order 2002-02. The project Operator should anticipate this eventuality and consider it in any long-term cost-benefit analyses they conduct. The increased scrutiny that will need to be paid to the management of steelhead as a result of the retention of the Dam may, over the years, end up placing a greater burden on CAW than the investment that could be made in the short run to effect Alternative 3.

GEN-21

Logistical considerations

Finally, DFG hopes that the CEQA and NEPA Lead Agencies have fully and responsibly considered the fact that the cost differential between the proposed project and removal alternatives, in particular Alternative 3, may not have to be fully borne by CAW. We hope that an economically based statement of overriding considerations will not be considered until a thorough review of potential and existing funding sources occurs. Resource agencies are well aware of the historic opportunity to restore a significant portion of the Carmel River watershed, and it is highly likely that they can assist CAW identifying funding support to offset the additional cost for dam removal. For its part, DFG understands DWR's interest in eliminating the risk to the public in a timely manner, and would be willing to assist within its means to facilitate efforts for obtaining funds without jeopardizing project momentum. We would also recommend that CAW note that DFG administers a Fisheries Restoration Grant Program (FRGP), and that a dam removal project of this nature would be eligible for funding (although it should be noted that FRGP grants are typically not large enough to cover more than a portion of the overall expense of a project of this scope). Perhaps more significantly, DFG provides input to other funding bodies, and could be counted on for support if and when dam removal becomes an option. The next deadline for FRGP grant proposals is in March 2007 for funds to be disbursed in 2008. We would also consider providing technical support for reducing any remaining uncertainties with finalizing designs for dam removal and or river re-route.

CR-5

GEN-22

We have noted that there were some moderate ambiguities and unresolved issues in the description of Alternative 3, but have not addressed them in this letter (e.g. a curious absence of reference to the growing knowledge base pertaining to dam removal in the United States).

NEPA/ CEQA 30

Please be advised this project will result in changes to fish and wildlife resources as described in the California Code of Regulations, Title 14, Section 753.5(d)(1)(A)-(G) . An environmental filing fee as required under Fish and Game Code Section 711.4(d) should be paid to the Monterey County Clerk on or before filing of the Notice of Determination for this project.

If you have comments or questions regarding this letter, please contact Serge Glushkoff, Environmental Scientist, at (707) 944-5597 or SGlushkoff@dfg.ca.gov; or Scott Wilson, Habitat Conservation Supervisor, at (707) 944-5584

Sincerely,

Original Signed by C. Catalano for

Robert W. Floerke
Regional Manager
Central Coast Region

cc: See next page

paula

A. G. DAVI
REAL ESTATE

May 25, 2006

Ms. Paula Landis
California Department of Water Resources
San Joaquin District
3374 E. Shield Ave. Room A-7
Fresno, California 93976

Subject:
San Clemente Dam
Carmel Valley
Monterey Peninsula Water Management District
California American Water Company

Dear Ms Landis:

I am writing to you regarding the proposal relating to the San Clemente Dam in Carmel Valley, California. As you know' the Monterey Peninsula and surrounding areas has inadequate water storage facilities, that the State of California has mandated this problem be resolved and that California American Water Company reduce its pumping from the Carmel River, which is and has been our primary source of water for hundreds of years.

The San Clemente Dams original water capacity was 2,000 acre-feet and now is only 100 acre-feet. The Dams retrofitting and refilling to 2,000 acre-feet would go a very long way to solving the excess pumping and our water dilemma. Our problem, as I understand it, is not the availability of water it is the ability to store excess water, which now flows to the sea.

WAT-8

Although the cost may be high, the need is even higher. The Monterey Water Management District was formed several decades ago for the purpose of developing a solution to the water problem. They have spent hundreds of millions of dollars on programs, studies, and water conservation policies; however, they have been unsuccessful in developing a serious storage source.

Environmentalists have successfully blocked every plan for long-term storage that has been proposed. While I support protecting the environment, I also believe that the needs of the public should be equally protected. The Monterey Peninsula Water District probably has one of the highest water rates in the country and I understand substantial increases will be forthcoming.

The San Clemente Dam is an opportunity to create a major water storage facility. This is an existing facility the community has accepted and to retrofit the dam, I believe, should be given very serious consideration.

While rerouting the river for the fish and preserving the frogs habitat is important, it is equally important and the responsibility of the State of California to provide leadership to help resolve this storage problem. Remember it was the State of California that mandated the reduction in pumping from the Carmel River that resulted in a water problem for the community being served.

A. G. Davi
Real Estate
480 Washington Street
P.O. Box 2350
Monterey, CA 93942
Phone 831.373.2222
Fax 831.373.3536
E-mail agdavi@agdavi.com
www.agdavi.com

For example, currently there are numerous owners of lots of record in the district that are unable to obtain water for their properties. So lot owners continue to pay property taxes without the use of their property. Also changes of use in the commercial properties that result in increased water use are prohibited. Commercial property owners experience longer vacancy periods and businesses have limited expansion opportunities.

CR-2 I recognize that the cost of retrofitting will be high. However, if the river is diverted, silt removed, fishes and frogs protected and ultimately the dam is removed, we the rate payers will foot the bill by increased rates to pay for the aforesaid without the benefit of any improvement in our water supply.

The primary issue here is the need for an adequate water supply to service the needs of the people living in the communities. So who is in front, the cart or the horse?

Once again I urge you to give this very serious consideration. Once the dam is gone this potential storage facility will be lost forever.

Cordially,

Anthony G. Davi, Sr.
Citizen and Tax Payer

CC: Robert Smith, U.S. Army Corps of Engineers, San Francisco District

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

June 29, 2006

Robert Smith
U.S. Army Corps of Engineers
San Francisco District
333 Market Street
San Francisco, CA 94105

Subject: Draft Environmental Impact Statement (DEIS) for the San Clemente Dam Seismic Retrofit Project (CEQ# 60182)

Dear Mr. Smith:

The U.S. Environmental Protection Agency (EPA) has reviewed the DEIS referenced above. Our review is pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act. Our detailed comments are enclosed.

The San Clemente Dam needs to be strengthened in order to comply with the California Department of Water Resources, Division of Safety of Dams requirements to address safety deficiencies and eliminate the risk of failure from a Maximum Credible Earthquake (MCE) and Probable Maximum Flood (PMF) event. The Carmel River Watershed Assessment and Action Plan (2004) documented the need to upgrade or remove the dam (DEIS, p. 5-14). The U.S. Army Corps of Engineers (Corps) and the California Department of Water Resources are proposing to strengthen the dam and replace the existing fish ladder.

NEPA/ CEQA-32

Based on our review, we have rated the document as Environmental Concerns - Insufficient Information (EC-2) (see enclosed "Summary of Rating Definitions"). We have some concerns with the proposed retrofit plan and request that additional clarifications be made in the FEIS regarding the long-term impacts and benefits associated with the alternatives. EPA recommends that the FEIS include additional information related to the Clean Water Act (CWA) Section 404(b)(1) process and the short and long-term economic and environmental costs and benefits of each alternative. In particular, the FEIS should include an analysis of the projected long-term benefits to the River and the steelhead population from the removal of the dam.

Printed on Recycled Paper

We appreciate the opportunity to review this DEIS. When the FEIS is released for public review, please send (2) copies to the address above (mailcode: CED-2). If you have any questions, please contact me at 415-972-3988 or Summer Allen, the lead reviewer for this project. Summer can be reached at 415-972-3847 or allen.summer@epa.gov.

Sincerely,

Duane James, Manager
Environmental Review Office

Main ID # 4462

Enclosures: Summary of Rating Definitions
Detailed Comments

Clean Water Act, Section 404(b)(1)

All project alternatives will have impacts to Waters of the U.S. and wetlands and will need a Clean Water Act (CWA), Section 404(b)(1) permit. The CWA, Section 404(b)(1) Guidelines (40 CFR 230.10(a)) require the selection of the Least Environmentally Damaging Practicable Alternative (LEDPA). This determination must take into account effects to all resources.

NEPA/ CEQA-33

Recommendation:
The FEIS should include a summary of the CWA, Section 404(b)(1) permitting process and ensure that the LEDPA will be selected in the Record of Decision (ROD).

Cost Analysis

We recognize that one of the project objectives is to minimize the financial impacts to California American Water Company (CAW) rate payers (p.1-2). Appendix D in the DEIS includes the costs associated with various sediment disposal sites, which represent a portion of the costs of Alternative 2. However, it does not include a cost analysis for the other alternatives proposed, future maintenance costs, or alternative funding possibilities. This information is important to help inform decisions regarding the long-term economic costs or benefits of various measures such as dam removal and on-site sediment stabilization, as well as other alternative measures.

CR-11

Recommendation:
The Alternatives Analysis in FEIS should be expanded to include a short and long-term cost analysis of the alternatives in a comparative format to help inform decisions. It should include information on the feasibility of funding for these projects and any interested parties that may be able to coordinate on project costs or related monitoring and mitigation.

Alternatives Analysis

All project alternatives may have short-term impacts to California red-legged frog habitat and water quality due to sedimentation or sediment deposition. However, we note that selecting an alternative that incorporates dam removal (such as Alternative 2 or 3) would meet the project purpose and need, restore the natural basin hydrology, and provide long-term benefits to the threatened steelhead population in the Carmel River by improving fish passage and the stream gravel replenishment necessary for spawning. The document notes that passage in a free-flowing stream is preferable to a fish ladder (p. 5-22). It also documents a concern that the steelhead population is threatened by the development of water resources, drought, and watershed, land use, and environmental problems (p. 4-103). However, the analysis in the DEIS does not fully describe the environmental benefits (both in the River and the steelhead population) that may result from removal of the dam.

FI-111

In addition, we note that the decision to stabilize the sediment in place (as proposed in Alternative 3) would reduce habitat impacts to special status species in the area, as disposing of large volumes of sediment at the proposed sediment disposal site could destroy habitat and may also injure or kill special-status wildlife species (p. 4-209). Alternative 3 (Carmel River Reroute

FI-112

and Dam Removal) is expected to take the same amount of time to complete as the Proposed Project (Dam Strengthening), but unlike the Proposed Project, it would not have unmitigatable significant turbidity impacts to the Carmel River from sluicing (p. 2-37 and 5-2).

FI-110

Recommendations:
In order to fully weigh the costs and benefits of each proposed alternative, the FEIS should include a detailed analysis of the projected effects of the removal of the dam on the River and the steelhead population. This information should be used in the determination of the LEDPA.

June 6, 2006

Ms. Charyce Hatler
California Department of Water Resources, San Joaquin Office
3374 East Shields Avenue
Fresno CA 93726-3323

Subject: San Clemente Dam

Dear Ms. Hatler,

David Zaches raised the question about possible toxins in the sediment proposed for use in the old river channel. The bottom layers of sediment have been there for many years; who knows what was used on the land during the 1920's and 30s? Have core samples been taken to better understand what may be there? To make red legged frog habitat, will it be similar to wetlands, even with the grouting? What are the chances that, even if the sediment is thoroughly mixed before spreading, toxin levels will not affect any frogs which takes up residence there?

SED-4

TE-6

John W Fischer

John W. Fischer
230 Grove Acre Ave., #313
Pacific Grove, CA 93950-2356

Steven A. Hillyard
PO Box 6475
Carmel, California 93921

June 27, 2006

Paula J. Landis, Chief
California Department of
Water Resources
San Joaquin District
3374 East Shields Ave., Room A7
Fresno, CA 93726

Robert Smith, Project Manager
United States Army Corps
of Engineers
San Francisco District
3333 Market Street
San Francisco, CA 94105

Re: San Clemente Dam Seismic Safety Project (EIR/EIS)

Dear Ms. Landis and Mr. Smith:

WAT-13

The EIR/EIS considers five alternatives including two that interest me. First, it considers removing slit in preparation for removing the dam. Second, it considers strengthening the dam. Since both are feasible, this means that the dam continues to be a technically viable water storage facility with a current status of being burdened by extensive deferred maintenance.[1] Because the EIS/EIR fails to consider this alternative, it is deficient.[2]

Your agencies can take notice of the fact that the Monterey Peninsula has a very urgent water storage need. Further, you can assume that additional water storage or desalinization facilities will be built to meet this need. The current debate over the desalinations plants planned for Moss Landing is credible evidence of the validity of these assumptions.

AA-64

There are very significant environmental impacts associated with the alternatives to using San Clemente Dam for meeting at least a portion of the Peninsula's water needs. Those associated with the desalination project, including operational impacts such as the discharge of green house gasses associated with powering the process, are the most glaring.

Because San Clemente Dam is a viable storage facility, the alternative "uses" that call for it to be taken out of service are burdened with the external environmental impacts

---

[1] It is viable well into the future as ongoing maintenance dredging with discharging the spoils downstream appears acceptable under Corps rules as long as the amount dredged does not exceed the flow of slit entering the dam from upstream.

[2] CAL-AM may argue that they have no right to extract additional water from the Carmel River. Maybe, but someone—perhaps the community at large—enjoys that right and could sell it to CAL-AM or contract to store water in the dam.

AA 64

associated with replacing its storage capacity. To make an informed decision in the permitting process, decision makers should be informed of these impacts. To facilitate that, the EIS/EIR should consider the rehabilitation alternative.

Sincerely,



Jeremy Pratt
05/26/2006 11:36 AM
CDT

To: Kimberly Demuth/Entrix, Brad Boyes/Entrix,
cc:
Subject: Larry Horan and the Stone Cabin

Hi Kimberly and Brad

Larry Horan is an attorney practicing in Monterey who is part of an investment group that owns the Stone Cabin - listed as HR-8 in the San Clemente EIR/EIS cultural resources section (described p. 4-335). He spoke with me after the Public Hearing and I believe he may have already called Kimberly and left a message.

REC-1

Larry apparently originally owned the Stone Cabin and the surrounding 1600 acres of land. He donated 1000 acres of the land to the Park District (including I believe what is our proposed sediment disposal Site 4R), and now owns the cabin as a remote recreational refuge with an investment group of 10 attorneys. (He says his area of practice, by the way, is land use and CEQA.) The so-called "jeep trail" or "4WD road" that is proposed to be improved for the alternatives that need access above the dam from Cachagua Road was developed to serve (and still serves) the Stone Cabin. The Stone Cabin remains in current use by the investment group. Obviously, the current use - as a serene, remote wilderness getaway - is incompatible with the improvement of the road and its use to transport heavy equipment and materials for Alternatives 1, 2, and 3. In other words, there will be unavoidable significant impacts that cannot be mitigated and are not really brought out in our current draft. We need to document those impacts.

Larry is a very personable, reasonable individual. He was concerned that the use of the road as proposed is tantamount to a "taking" of the Stone Cabin property and has significant adverse impacts to the purposes for which land was donated to the Park District. We will need to address this as a comment and revision to the impact analysis. We need a more detailed characterization from **MWH (Vik and Dan)** as to the projected use of the road for each alternative - during what seasons of the year, for how many years, for how many trips, with what daily frequency, of what size of vehicle. We need **Brad** to revisit the noise impacts. We need **Kimberly**'s team to revisit the recreational/land use impacts - not the impact on the Stone Cabin itself as a historical resource, but on the use of it. As part of that, we need to consult with the Monterey Park District (I am sure Larry will contact - or has contacted - them to ask about their participation in our process and what comments they will submit. I know that Jan Driscoll or John Klein called them about the use of Site 4R for sediment disposal, and I understand that they did not respond to that overture. They are not on our list of California Responsible Agencies, and probably should be added.

Jeremy Pratt
ENTRIX, Inc.

LAW OFFICES OF
HORAN, LLOYD, KARACHALE, DYER, SCHWARTZ
LAW & COOK
INCORPORATED
499 VAN BUREN STREET, P.O. BOX 3350
MONTEREY, CALIFORNIA 93942-3350

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Francis P. Lloyd
Anthony T. Karachale
Stephen W. Dyer
Gary D. Schwartz
Mark A. Blum
Mark A O'Connor
Robert E. Arnold III
Elizabeth M. Gianola
Aengus L. Jeffers
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Michael P. Burns
Mary E. Cain

James J. Cook
Dennis M. Law

Telephone: (831) 373-4131
From Salinas: (831) 757-4131
Facsimile: (831) 373-8302

Our File No.

June 27, 2006

Ms. Paula J. Landis, Chief
California Department of Water Resources
San Joaquin District
3374 East Shields Avenue, Room A-7
Fresno, CA 93726

Robert Smith, Project Manager
United States Army Corps of Engineers
San Francisco District
3333 Market Street
San Francisco, CA 94106

Re: San Clemente Dam Draft EIS/EIR for Safety Retrofit or Dam Removal

Dear Ms. Landis and Mr. Smith:

I am a co-owner in joint tenancy with others of real property located between Cachagua Road and the San Clemente Dam site in Carmel Valley, California. Our co-tenants purchased the property which then consisted of 1584 acres from the Pebble Beach Corporation in 1978. Shortly following the purchase our co-tenants entered into a scenic conservation easement deed to the County of Monterey. The purpose of the scenic conservation easement deed was to keep the property as permanent scenic open space. Among the restrictions were that no structures could be placed or erected on the property, no advertising located thereon, no vegetation except that indigenous to the area could be planted, and that the general topography of the landscape would be maintained in its then present condition. The owners reserved the rights to prune, trim, and maintain plant and tree life on the property, to enjoy the land in a manner not inconsistent with the restrictions imposed, and the right to use, repair, and maintain the existing scenic historic stone cabin on the property.

The scenic conservation easement deed further provided: "If all or any portion of the land described in Exhibit A is sought to be condemned for public use this easement shall terminate as of the time of the filing of any complaint in condemnation as to the land or any portion thereof or any right therein sought to be taken for public use and the owners shall be entitled to such

compensation for the taking as the owners would have been entitled to had the land not be burdened by this easement."

Subsequent to the imposition of the aforesaid scenic conservation easement the co-tenant owners of the property have made two conveyances, both of which naturally remain subject to said scenic conservation easement: (1) Conveyance of 600 acres on the south side of the Carmel River to Rancho San Clemente for their use for grazing purposes; and (2) conveyance of approximately 960 acres to the Monterey Regional Park District for park purposes subject to the terms and conditions of such conveyance, including the aforesaid scenic conservation easement.

REC-2
LAND-2

Any of the alternatives explored in the draft EIS/EIR which would utilize the access road to the property from Cachagua Road to the area of the San Clemente Dam, any rerouting of the Carmel River in that area, or any deposition of any of the silt accumulated behind San Clemente Dam would create a situation in which the use of our remaining property and the historic Murphy stone cabin, the use of the Park District's property for scenic and park purposes, or the maintenance of the terms of the scenic conservation easement imposed by us some 36 years ago would be vitiated.

GEN-35

The use of our access road by trucks and other vehicles for the purposes outlined in the Draft EIS/EIR would create significant unmitigated impacts with respect to: (1) geologic stability; (2) vegetation; (3) different species of birds, including wild pigeons, mourning doves, California quail, and great blue heron; (4) red-legged frog; (5) California steelhead/salmon; (6) our river frontage and the despoliation and elimination of a significant number of acres of sensitive wetlands; (7) impaired air quality; (8) significant traffic safety impacts at the intersection of Cachagua Road and elsewhere on the property; (9) destruction of the pastoral rural quality of life which both the owners and their donee Park District have strived assiduously to maintain; and (10) destruction of a valuable historic resource: one of the first settler cabins in the Carmel Valley, which the owners have restored and which can never be duplicated.

It is almost unthinkable that the voluminous documents comprising the draft EIS/EIR pay virtually no heed whatever to the foregoing impacts, nor does it mention in any significant manner the fact of 960 acres of park land and the historic Murphy's cabin. For the edification of the lead agencies and their consultants as well as the project proponent I enclose with this correspondence (1) a copy of a letter dated February 8, 2001 outlining the proposed gifting of the property from the tenants in common to the Monterey Peninsula Regional Park District; (2) a copy of a letter dated April 5, 2004 expressing that thanks and gratitude of the Park District to the donors; and (3) a photocopy of an editorial of the Monterey County Herald dated February 1, 2004 expressing gratitude for the donation and describing some of the purposes for which the donation was made. An earlier quote from the Herald in 1979 noted:

> This is rugged country, on the edge of the Los Padres National Forest and the Ventana Wilderness, and looks as unspoiled as it must have 100 years ago. And that is the way it is to remain. The 10 families who own the property plan to use it just for hiking, camping, and picnicking, plus a little trout fishing, and other than rebuilding Murphy's cabin, no other construction is to be allowed. The property is believed to contain a number of ancient Indian Burial grounds.

I will be leaving for Atlanta tomorrow and will not return until July 3, hence this rather abbreviated comment on some of the problems with your current Draft EIS/EIR. Upon my return I will be most happy to both augment and amplify the comments herein.

Very truly yours,

Laurence P. Horan

LAURENCE P. HORAN

LPH:mfr
Enclosures
cc: Monterey Peninsula Regional Park District
Fellow property owners

MONTEREY BAY
Unified Air Pollution Control District
serving Monterey, San Benito, and Santa Cruz counties

AIR POLLUTION CONTROL OFFICER
Douglas Quetin

24580 Silver Cloud Court • Monterey, California 93940 • 831/647-9411 • FAX 831/647-8501

DISTRICT BOARD MEMBERS

CHAIR:
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Santa Cruz County

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Marina

John Myers
King City

Dennis Norton
Capitola

Ellen Pirie
Santa Cruz County

Jerry Smith
Monterey County

June 20, 2006

Ms. Charyce Hatler
Dept. of Water Resources
San Joaquin District
3374 East Shields Avenue
Fresno, CA 93726-6913

Transmitted Electronically To:
chatler@water.ca.gov

Mr. Robert Smith
U. S. Army Corps of Engineers
San Francisco District
333 Market Street, 8th floor
San Francisco, CA 94105-2197

Transmitted Electronically To:
robert.f.smith@usace.army.mil

SUBJECT: SAN CLEMENTE DAM SEISMIC SAFETY PROJECT DEIR AND DEIS

Dear Ms. Hatler and Mr. Smith:

Staff reviewed the document and submits the following comments regarding the San Clemente Dam project:

AQ-3 Current Federal and State Ambient Air Quality Standards. Page 4-233.
The Federal 1-hour standard for ozone was revoked on June 15, 2005.

AQ-4 Table 4.7-8: NCCAB Attainment Status. Page 4-238.
With the revocation of the Federal 1-hour standard for ozone, the North Central Coast Air Basin (NCCAB) is no longer classified as Maintenance for the standard.
The NCCAB is classified as Non-Attainment Transitional for the State 1-hour standard for ozone.

AQ-5 Adoption of SB 656 Plan for Particulate Matter in the NCCAB. Page 4-238.
The Plan was adopted by the District Board in December 2005.

AQ-6 General Conformity. Page 4-239.
With revocation of the Federal 1-hour standard for ozone, the NCCAB is classified as attainment for all the federal air standards.

AQ-7

Impact Assessment Methodology. Page 4-240.
Please contact the District to discuss the calculations for the on-road diesel-powered trucks and suggested mitigation measures to reduce emissions to below District daily thresholds of significance. One suggestion is to mitigate the NO_x emissions by using a product like Viscon, which would achieve an approximate 25% reduction in NO_x. Information concerning this product and CARB- and EPA-recognized lab test results is attached for your reference.

AQ-8

Emissions of NO_x and Significance of Distance to Receptors
As a precursor to the formation of ozone in an air basin that is non-attainment for the State ozone standard, NO_x is a criteria pollutant of regional (not only local) significance. The distance of the nearest residential receptors does not eliminate the impact of emissions of 443 lbs/day, when the threshold of significance is 137 lbs/day.

Impacts and Mitigations. Pages 4-242-257.

AQ-9a

Dam Site Activities: Construction Equipment and Road Dust.
Given the distance that particulate matter can travel and the duration of time that it may remain suspended in the atmosphere, as well as the non-attainment status of the NCCAB for the State PM_{10} standard, the distance to the nearest receptors does not eliminate its significance. For road dust, the District suggests that in addition to the mitigation measures listed on pages 4-247 and 4-248, the Project Applicant consider paving any unpaved roads or placing larger-sized crushed rock. Given the duration of the project, this could substantially decrease the formation of fugitive dust. For emissions from diesel construction equipment, the District suggests use of an additive such as Viscon to reduce NO_x emissions and use of a diesel oxidation catalyst to reduce emissions of ROG and PM_{10}. Please contact the District to discuss strategies that have been proven to reduce emissions.

AQ-9b

AQ-10

Access Road Upgrades
The mitigation measures should reduce fugitive dust to within thresholds.

TR-11

Project-Generated Traffic
There is no information concerning the number and type of vehicles to be used in the project, or the daily traffic schedule. This should be provided and URBEMIS 2002 v 8.7.0 should be run to calculate vehicular emissions. Please provide the District with a copy of the URBEMIS output.

AQ-11

AQ-12

Concrete Batch Plant Operation.
Please contact Lance Ericksen, Manager of the District's Engineering Division, to discuss permitting requirements.

Thank you for the opportunity to review the document.

Yours truly,



Jean Getchell
Supervising Planner
Planning and Air Monitoring Division

Attachment

cc: Lance Ericksen, Engineering Division
David Craft, Engineering Division

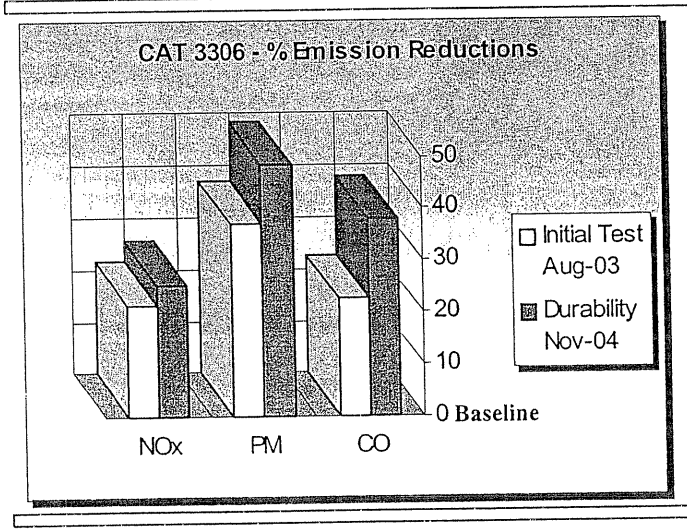
GTAT
California

Viscon

Bakersfield, CA
(661) 327-7451

GTAT Awarded A Grant From The Texas Commission On Environmental Quality

NEW! (TCEQ Press Release April 20, 2005) *NEW!*



Exhaust Emissions

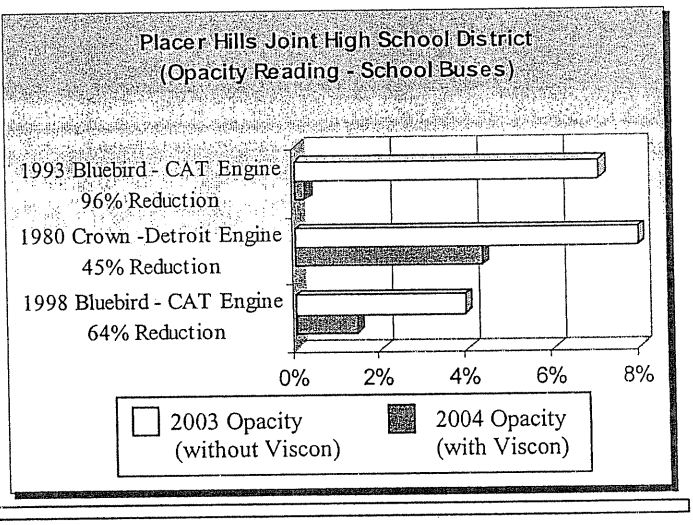
On November 26, 2004 GTAT completed its Exhaust Emissions testing for the Durability Phase of CARB Verification. EcoLogic Engine Testing Laboratory, an ISO 9001-2000 Registered facility and a CARB & EPA recognized lab performed the tests. The reduction results from baseline through the initial & durability exhaust emission tests are:

	Viscon Only	Viscon & 5% Biodiesel
❑ PM -	48.4%	45.4%
❑ NOx -	25.4%	24.3%
❑ CO -	37.9%	42.0%

Compliance & Smoke/Opacity Readings

From June to December, 2004 Placer Hills JHDS participated in a grant (received from the Placer County Air District – CA) awarded to GTAT. Opacity readings were conducted by Evenson's Smoke Testing using Red Mountain Engineering computerized equipment. All engines passed compliancy. Results from 2003 to 2004 comparison are:

- ❑ 96% reduction - 1993 Bluebird – CAT
- ❑ 45% reduction - 1980 Crown – Detroit
- ❑ 64% reduction - 1998 Bluebird – CAT

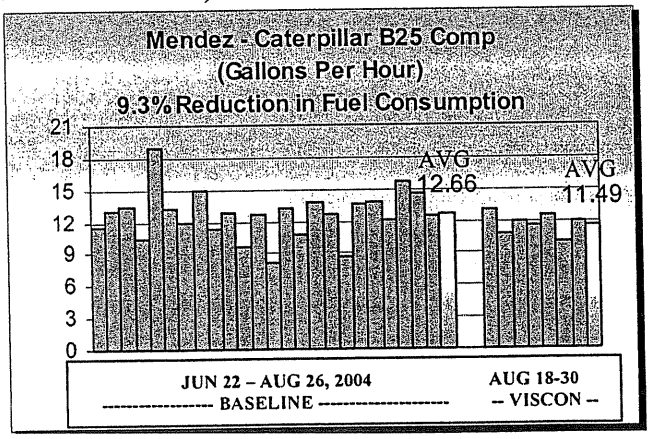


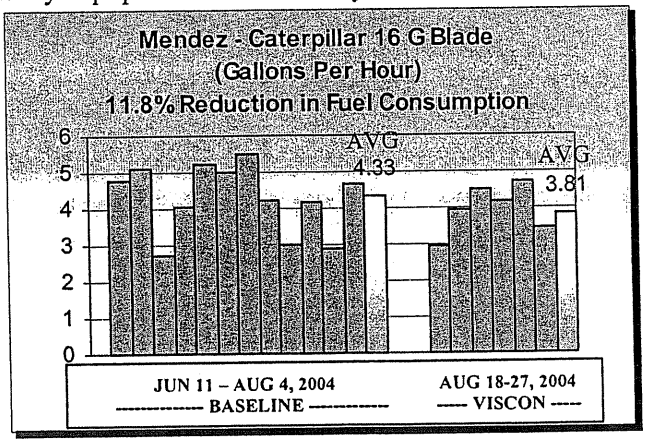
Permit to Operate/Authority to Construct

In April 2004, Nordic Industries was issued an Authority to Construct pursuant to operating more hours on a 1,072 HP CAT engine. Advanced Air Testing performed emissions testing (after Viscon treatment) in July 2004. Nordic Industries was issued a Permit to Operate on October 1, 2004. The PTO stipulates Viscon use.

Fuel Economy

During the summer of 2004, Mendez Construction participated in a grant (received from the Placer County Air District – CA) awarded to GTAT. The results from Heavy Equipment fuel economy follow.





Potential Emission Benefits of Biodiesel and a 20-Percent Biodiesel Blend		
Pollutant	**B100 (%)**	**B20 (%)**
NOx	+13	+2
Carbon Monoxide	-50	-20
Hydrocarbons	-93	-30
Particulate Matter	-30	-22
Sulfates	-100	-20*
Polycyclic Aromatic Hydrocarbons**	-80	-13
Nitro-PAH's**	-90	-50***

* Estimated from B100 result

** Average reduction across all compounds measured

*** 2-nitroflourine results were within test method variability

Source: Biodiesel Emissions, Fact Sheet, National Biodiesel Board

Biodiesel reduces the health risks associated with conventional diesel fuel. Biodiesel emissions showed decreased levels of PAH and nitrited-PAH (nPAH) compounds, which have been identified as potential cancer causing compounds. In recent tests, PAH compounds were reduced by 75 to 85 percent, with the exception of benzo(a)anthracene, which was reduced by roughly 50 percent. Also nPAH compounds were reduced significantly. The 2-nitrofluorene and 1-nitropyrene emissions were reduced by 90 percent, and the rest of the nPAH compounds were reduced to only trace levels. These toxic emission differences are likely to be smaller when compared to CARB Diesel fuel, but may still be significant. More data comparing CARB Diesel to biodiesel are needed.

C. Diesel Fuel Additives

There are thousands of additives that have been registered with the U.S. EPA as injector cleaners, corrosion inhibitors, or lubricity enhancers; however, the focus of this section is to investigate existing additives and their effectiveness in reducing diesel PM emissions from diesel engines. Additive manufacturers have used different additives to improve combustion efficiency or to facilitate the post combustion reactions in a catalyst or particulate filter. However, in many cases very limited data is available regarding the use of these additives in California diesel fuels. The following is a description of information provided to the ARB staff with regard to additives and their potential ability to reduce diesel PM. Any additives with unsupported claims of emissions reductions were not included; however, the discussion of the following additives does not constitute an endorsement or confirmation of the results by the ARB staff.

From: DAVID CRAFT
To: Getchell, Jean
Date: 6/20/2006 11:34:23 AM
Subject: Viscom's potential emission reductions

Here is Viscom's website showing emission reductions due to the additive.
http://www.gtatcalifornia.com/Viscon/HomePage.html

Perhaps a 25% NOx reduction is achievable using Viscom.

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July 3, 2006

Ms. Paula Landis, Chief
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3374 East Shields Ave, Rm A-7
Fresno, California 93726

Robert Smith, Project Manager
US Army Corps of Engineers
3333 Market Street
San Francisco, California 94106

RE: Draft San Clemente Dam Seismic Safety Project EIR/EIS

Dear Ms. Landis & Mr. Smith:

The Monterey Peninsula Regional Park District (Park District) is a special district sub-division of the State of California organized under Public Resources Code 5500 et seq. The residents of the Greater Monterey Peninsula created the Park District in 1972 for the express purpose of acquiring and protecting open space for public use and enjoyment. The Park District has protected approximately 20,000-acres for the 150,000± residents in its 400-square mile district.

The subject project lies within the district and is adjacent to, and includes, property owned by The Park District.

A The Park District has reviewed the draft EIR/EIS and has the following comments:

B **Overall:** The document is lacking in graphic support of textual project impacts. In order to make an informed decision on alternatives and potential impacts, The Park District requests more sophisticated visual exhibits:

GEN-38

1. GIS ortho-photo quads for use as base-maps for comparison between all projects, which show project locations, specific project component sites, property boundaries, landmarks, geographic features, and include meta data in electronic format. This data is readily available;

AA-65

2. Cross-sections, cut-material, and images of road improvements and construction and Site 4R are necessary for adequate environmental review;

LAND-3

3. As examples: Both 3.2 Proposed Project and 3.3 Alternative 1 do not have adequate project area descriptions, land ownership, or map depicting land

LAND-3

ownership and boundaries;

4. Another example: Figures 3.3.3 and 3.3.4: These figures show the Cachagua/4R Access Route (jeep trail) and Conveyor Route through The Park District's San Clemente Open Space and a large Sediment Disposal site within the property but there is no written description of either in Section 3.2 Proposed Project;

AA-66

B. Viewshed: The Draft EIR/EIS states "None of the alternatives will have a significant impact on the environment." However, there is no evidence in the document to make such a finding. And there is no information in the document for public review and comment. The entire treatment of public viewshed and aesthetics is inadequate.

1. The Proposed Project and Alternatives 1, 2, and 3 include property owned by The Park District that will be environmentally altered but there is no adequate description of the visual impact or any visual exhibits of pre-project and enhanced post-project images of the impact sites;

VIS-3

(a) Necessary images to adequately assess pre-project and post-project viewshed/visual impacts from within the open space park by park visitors include, but are not necessarily limited to:

- River front views;
- Standing water locations and conditions;
- Road-cuts and corridors;
- Sediment disposal site;
- River front access;

C. Project Access Roads and Sediment Disposal:

1. Figure 3.2.2: This figure shows the Cachagua/4R Access Route (jeep trail) and Conveyor Route through The Park District's San Clemente Open Space and a large Sediment Disposal site within the property but there is no written description of either in Section 3.2 Proposed Project;

AA-67

2. 3.3 Sediment Transport: The document does not adequately describe the "gravity feed reclaim tunnel system" for conveying the sediment to Site 4R in the park;

AA-68

3. 3.3 Sediment Transport: The document does not adequately describe how the road will be used or impacted by expected project use;

AA-69

4. Exhibit 3.3.5: This exhibit provides little to no value in evaluating the impact of heavy equipment on a narrow, un-surfaced, steep road or any information on necessary road improvements and their impacts to accommodate the expected project uses;

AA-70

5. 3.3 Sediment Disposal: The document states that the maximum capacity for sediment disposal at Site 4R is "undetermined" but there is no evidence in the document to support the finding that Site 4R can adequately accept the

AA-71

AA-71

estimated 1.5M CY of sediment material;

LAND-4

(a) The document states that The Park District has previously expressed "tentative support for sediment disposal at Garland Ranch...", provides a citation, but does not list The Park District as an agency consulted in Section 6.0 Lists and References. The Park District requests that the document cited be made available to The Park District for review;

AA-72
TE-35

(b) The document provides a cursory description of Site 4R preparation but is inadequate for proper review as there are no details as to how vegetation "clearing and grubbing" will take place, and how and where the "stripping and stockpiling of organic soils" will occur;

AA-73

(c) The document also states "a culvert pipe would likely be placed along the ravine bottom the full length of the site ...". For review purposes, this vague language is inadequate. Will or will not a pipe of the scale and scope described be installed? What are the possible environmental impacts if a pipe is or isn't installed? This type of information is not to be found in the document;

REC-3

(d) Figure 3.3.4: This map exhibit does not show property boundaries nor does it adequately describe the impact of 1.5M CY of sediment disposal into a public open space park;

LAND-5

(e) An aerial photograph and on-the-ground images of pre-project condition and post-project impact are needed to adequately evaluate this project;

AA-74
TE-36

(f) The document states that the site will be "winterized" at the end of each construction season but fails to adequately describe the impacts of introducing non-native stabilizing material into the park and any mitigation measures to remove the weeds proposed for introduction. Non-native vegetation is also proposed for introduction to the site for the final topsoil re-placement;

AA-75

(g) The document states that there will be 6-inches of Class 2 base-rock imported for the road surface but does not explain what will be done with this material after the project is completed;

VIS-4

(h) The document presumes to leave the road improvements behind but does not describe any environmental impacts associated with doing so, which would be aesthetic and visual and significant compared to what is there now. Given that the property is an open space park, the cursory information provided is inadequate for effective environmental review;

6. 3.3.5 Project Access and Improvements: The document gives a minimal description of the road improvements that does not adequately allow an effective review of potential impacts;

AA-76

(a) This description needs graphic support in the form of pre-project conditions and post-project enhanced conditions. The simple statement that the road will be widened to 20-feet does not adequately describe the scope and scale of the necessary road-cut, where the cut material will be deposited,

AA-76 what the road will look like after the project, or what new maintenance requirements The Park District will inherit if the road improvements are left in or restored upon completion of the project;

AA-77 (b) The new ½-mile long access road to Site 4R is similarly described in cursory terms and provides no graphic imagery of pre-project conditions and post-project impacts/conditions. There is also no description of what will become of this road upon project completion;

AA-78 **7.** 3.4 Alternative 2: The comments above apply to this alternative as well. The descriptions and graphic support need improvement if an adequate environmental review is to be undertaken. This alternative impacts The Park District to a greater magnitude in that the volume of sediment to be deposited in the park is 2.5M CY;

AA-79 **8.** 3.5 Alternative 3: Though this alternative does not propose Site 4R, it does affect The Park District's road into and through its San Clemente Open Space. The comments above that apply to the road are applicable for this alternative as well;

D. Wetlands: All the proposed projects include environmental impacts to existing wetlands. The Park District is concerned about potential short and long-term impacts to existing wetlands from the perspective of public access and viewshed. The document does not adequately address the impact of changing wetland conditions on public perception, view, and access and therefore the document VIS-5 cannot be adequately review for environmental impacts associated with changed public aesthetics and viewshed.

1. Textual descriptions of pre and post project conditions are needed for adequate review and comment on the aesthetic perspective to changing wetland conditions;

2. Pre-project and post-project enhanced photographic imagery depicting what the current and future park boundaries will look like are essential for adequate environmental assessment;

REC-4 VIS-6 (a) Currently, the park has an extended and publicly accessible riverfront to perennial pools and flowing water. What will any new boundary along the park's riverfront look like and how accessible will the new riverfront be to the public?

TE-37 (b) What will replace the current riparian vegetation along the park's riverfront boundary if the river course or water levels are changed?

(c) How will public access be affected and/or maintained if river-frontage is changed?

The Park District has no position on the proposed project or any alternative at this time because it cannot adequately evaluate the potential impacts presented by each project regarding viewshed, aesthetics, public access, and project developments until the information outlined above is made available.

The Park District appreciates the opportunity to comment on this project and looks

forward to the requested information in a revised draft EIR/EIS. If California Department of Water Resources or US Army Corps of Engineers has any questions, or would like to discuss the proposed project, the alternatives, or the Draft EIR/EIS with The Park District, please do not hesitate to contact Joseph Donofrio, The Park District's General Manager, or myself by phone or e-mail.

Sincerely,

TIM JENSEN
Planning and Programs Manager

831-372-3196 x2
tjensen@mprpd.org

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June 29, 2006

Department of Water Resources
San Joaquin District
3374 East Shields Avenue
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Attn: Charyce Hatler

U.S. Army Corps of Engineers
San Francisco District
333 Market Street, 8th Floor
San Francisco, CA 94105-2197

Attn: Robert F. Smith

Subject: MPWMD Comments on Draft Environmental Impact Report/Statement for the San Clemente Dam Seismic Safety Project, Corps PN 277446S

Thank you for the opportunity to comment on the Draft Environmental Impact Report/Statement (EIR/EIS) for the San Clemente Dam Seismic Safety Project dated April 2006. This document was prepared by Entrix Environmental Consultants (Entrix) for California American Water (Cal-Am or CAW). The Monterey Peninsula Water Management District (MPWMD or District) has participated for several years in the interagency groups formed to study alternatives for retrofitting San Clemente Dam, which is located on the Carmel River in Monterey County, California. The District submitted comments on the alternatives and potential environmental impacts described in the December 1998 Draft EIR and September 2000 Recirculated Draft EIR for the seismic retrofit project. In November 2004, the District submitted comments on the scoping for the Draft EIR/EIS and, in November 2005, the District submitted additional comments on the Notice of Preparation (NOP) for the Draft EIR/EIS for the seismic safety project. MPWMD also submitted comments on the December 2005 Revised Preliminary Draft EIR/EIS for the San Clemente Dam Seismic Safety Project.

Following are the District's comments on the April 2006 Draft EIR/EIS that you requested in your May 23, 2006 Notice of Public Hearing. Statements from the Draft EIR/EIS are shown in italics.

General Comments

GEN-12

For project impacts and components that are common to all alternatives, the Final EIR/EIS (or FEIR/S) should fully describe level of impact and measures to mitigate for impacts. For example, the reconstruction and retrofitting of the bridge at Old Carmel Dam (OCD) is a component of all alternatives, so a full description of impacts and mitigation measures to make
The alders that established a well vegetated canopy around the existing San Clemente Reservoir

were killed as a result of the Interim Drawdown Project, beginning 2003. The FEIR/S should include mitigation measures to revegetate the margin of the remaining reservoir area as part of Proposed Project, Notching Project, and Rerouting Alternative.

NEPA/ CEQA-18

Specific Comments

Chapter 2.0 Summary

Table 2.1, WR-2 through WR-5. This table does not describe ongoing stream degradation (incision into alluvial deposits) downstream of San Clemente Dam due to retention of sediment load within the reservoir. MPWMD notes that the Mussetter studies of sediment transport in the river under various alternatives set an artificial barrier (for modeling purposes) that did not reflect the potential for incision.

SED-22

MPWMD research in the early 1980's showed that the river had incised into floodplain deposits by up to 13 feet along much of the river since the reservoir was built. Recent surveys along the river indicate that this trend has not halted and the rate of degradation is estimated to be about one foot per decade, which has contributed to bank destabilization and undermining of infrastructure across and adjacent to the river. The dam thickening and dam notching alternatives are not likely to significantly slow or reverse this process, as most of the sediment load will be retained upstream of the existing dam location for several decades. The re-route and removal alternatives are likely to slow or halt the degradation process as the sediment load to the lower river would be increased substantially. The differences to downstream bank stability and infrastructure stability from each alternative should be described.

Page 2-2, Para 1: The statement, "*...and a trap and truck facility would be operated for one construction year...*", appears to conflict with other descriptions of proposed mitigations for trapping and handling steelhead in the Fish Chapter. The Final EIR/EIS should fully describe how fish will be trapped and trucked for each alternative during the entire scheduled project period, not only during actual construction activities. If fish are not trapped and trucked during the entire scheduled period, the FEIR/S should fully describe how fish movements will be impacted during the off-construction period and whether additional mitigations are needed.

FI-26

Page 2-2, Para 2: The statement, "*Two high-level outlets equipped with sluice gates would be installed to control and limit sediment releases...*", appears to conflict with the description of one mid- and one high-level outlet on page 3-26 and does not match the proposed limited operation of sluice gates during the winter period (see also comment on Page 3-18). The FEIR/EIS should fully evaluate how operation of proposed gates would control and limit sediment releases and include an evaluation of the timing of sediment releases based on MPWMD's record of reconstructed unimpaired streamflow at San Clemente Dam.

SED-23

Page 2-5, Para 2: Description of Reroute and Dam Removal, the statement, "*The San Clemente*

Creek channel would be reconstructed through its historic inundation zone from the exit of the diversion channel to the damsite...", conflicts with the description provided on page 3-81, where the reconstruction is defined as the same as described in section 3.3 for the notching alternative. The notching alternative references reconstruction only in the uppermost 900-foot long section of the inundation zone. Also note the comments on Page 3-81 concerning routing the combined flows from the mainstem and San Clemente Creek through the historic San Clemente Creek channel.

HY-5

Page 2.-5, Para 4: Under Description of No Project: Conclusion. "*The existing drawdown ports in the dam and the existing fish bypass facility would both likely remain operational until the reservoir fills with sediment.*" At the beginning of the winter of 2005-06, sediment in the mainstem was within about 20 feet of the easterly port opening. It is likely that use of the ports will be in jeopardy well before the entire reservoir fills with sediment because the bulk of the remaining reservoir storage is on the San Clemente Creek side of the reservoir and is filling much more slowly than the mainstem side. The FEIR/S should evaluate whether the existing ports will be used and how in the No Project setting.

SED-24

Page 2-36, Table 2.4: The tabulation of acreages under *Other Waters of the U.S.* appears to underestimate the extent of waters affected by alternatives. For example, under Alternative 2 the total area of waters listed for the Carmel River, San Clemente Creek, and Reservoir Pool is 10.9 acres, including 6.8 acres for the reservoir pool, leaving 4.1 acres for the Carmel River and San Clemente Creek. The length of stream affected by existing San Clemente Reservoir is ~7,250 feet in the mainstem and ~ 2,500 feet in San Clemente Creek. Based on the combined lengths, the average stream width of Other Waters is purportedly ~18 feet, yet this seems well under actual measurements of stream widths in the affected waters. For example, measurements of average stream width at two sites in the inundation zone show that stream width varies from 18 to 34 feet, and these measurements were made during the lowest flow periods in 2004 and 2005. The source of possible error(s) is beyond the scope of this review, but the FEIR/S should reevaluate methods, standards and analysis used to develop areas of both Other Waters and Jurisdictional types and validate estimates with measurements in the field.

WET-3

Page 2-36, Table 2.4: The characterization of impacts for Alternative 4 (No Project), *No direct impacts*, ignores continuing impacts of the interim drawdown project on Jurisdictional and Other Waters of the U.S. In this regard, the Final EIR/S should fully address potential impacts of the Drawdown Project.

WET-4

Page 2-38, Para 3: Summary statement under Water Quality. "*Sluicing under the PPP and Alternative 1 would lead to significant increases in turbidity in Carmel River below the dam and would not be mitigable.*" This statement should be modified to describe which flow components increase turbidity (suspended and bedload sediment?). It's unclear from the qualifier used ("*mitigable*") what impacts cannot be mitigated. This determination is necessary to realistically

WQ-2

WQ-2 evaluate potential impacts to rearing and spawning habitat in the river downstream of San Clemente Dam.

Page 2-39, Para 1: Under Fisheries: "*The PPP and all alternatives would entail short-term losses of fish habitat.*" With at least one alternative - the Dam Removal Alternative – there would be long-term beneficial changes to habitats. The FEIR/S should fully evaluate short-term, mid-term
FI-27 and long term changes for spawning and rearing habitats from the upper end of San Clemente Reservoir to the Carmel River Lagoon.

Page 2-39, Para 1: Under Fisheries: In the Summary Statement, the operation and impacts to Sleepy Hollow Steelhead Rearing Facility and its vulnerability to increased sediment and turbidity is not mentioned. The FEIR/S should fully evaluate impacts of the alternatives and describe the mitigation measures that Cal-Am will implement to reduce impacts to SHSRF. If
FI-28 the impacts, especially during construction, cannot be avoided, the FEIR/S should disclose impacts and potential take associated with not rearing steelhead at SHSRF during the construction period. It should be noted that the MPWMD operates and maintains the SHSRF as a mitigation for impacts to steelhead from water extraction in Carmel Valley.

Chapter 3.0 Description of Alternatives

Page 3-2, Para 5: Under Removal of Dam Superstructure. Given that most alternatives would
AA-22 likely take several years before construction could start, is the possibility of implementing this measure being discussed as part of an Interim Retrofit Project? If so, this should be described.

Page 3-5, Para 1: Under Sediment Management Alternatives, the FEIR/S should fully evaluate
SED-25 the long-term impacts associated with trapping gravel and cobble with each alternative. The FEIR/S should fully evaluate options for stockpiling and releasing gravel and cobble into the river channel below the project area as mitigation for trapping of coarse bedload.

Page 3-8, Para 4: "*Approximately four miles upstream ...*", should be corrected. Los Padres Dam
GEN-13 is five miles upstream of San Clemente Dam (23.5 -18.5).

Page 3-12, Para 1: "*The reservoir and Carmel Valley [Filter Plant] CVFP are also the primary water source for unincorporated Carmel Valley Village during the winter. Currently, the reservoir serves as a point of diversion to serve the Peninsula...*" The FEIR/S text should be
WAT-1 corrected to reflect operations as regulated by NOAA Fisheries and the State Water Resources Control Board. These agencies have limited the diversions at San Clemente Dam to zero and allow only limited diversions from the river from Russell Well field during low-flow season.

Page 3-15, Para 3: Under Fish Ladder, the description for FEIR/S should be revised to reflect
AA-23 installation and operation of the fish bypass for downstream migration during Interim Retrofit

Operations.

WAT-2 Page 3-15, Para 4: Under Carmel Valley [Filter Plant], the description for FEIR/S should be revised to reflect comment 3-12, Para 1 above.

AA-24 Page 3-17, Figures 3.2-5, 3.2-6 and 3.2-7: These figures appear out-of-date (Woodward-Clyde 1998) and do not match the features described in the text for fish passage and sediment sluicing. The FEIR/S should provide new updated versions.

AA-25 Page 3-18, Figure 3.2-6: The profile of the thickened dam shows a seven-foot diameter sluiceway at an invert elevation of 514, a two-foot diameter sluiceway at an invert elevation of 517, and an eight-foot diameter sluiceway at an invert elevation of 491. The discussion on p. 3-25 starting with "High-Level Outlets" describes operations that apparently would include sluicing of sediment through all three of these pipes, whereas the analysis of proposed sluicing presented in Appendix I describes placement of a new 10-foot diameter pipe through the thickened dam at an invert elevation of about 515. Please resolve the discrepancies between the main text and Appendix I.

AA-26 Page 3-21, 1st bullet under Para 3: What keeps sediment and water from upwelling in the area between sheet pile barrier and dam intake during the drawdown? How would this area be dewatered without a seal capable of withstanding the differential pressure between the drawn down water surface elevation (510) and the gate at elevation 494? The FEIR/S should fully evaluate this aspect and recommend mitigation measures to match results of the evaluation.

WQ-3 Page 3-21, 2nd bullet under Para 3: No standards are provided for turbidity levels that may be too high to release. The FEIR/S should provide standards and a specific, detailed description of how the project construction and operations schedule would be modified to mitigate for increased turbidities. Has the possibility of filtering turbid water through the Carmel Valley filter plant and then injecting clear water into the river been considered?

WQ-4 Page 3-23, Para 2: A turbidity standard needs to be presented that will protect downstream areas from impacts. Because construction is proposed during low flow periods, the effect of turbid water being released to downstream areas can persist for several miles downstream from a release point.

Page 3-24, Spillway and Crest Modifications

The discussion includes the following statement: *"...the increased spacing between piers would reduce the buildup of downed trees and other debris at the existing closely spaced piers."*

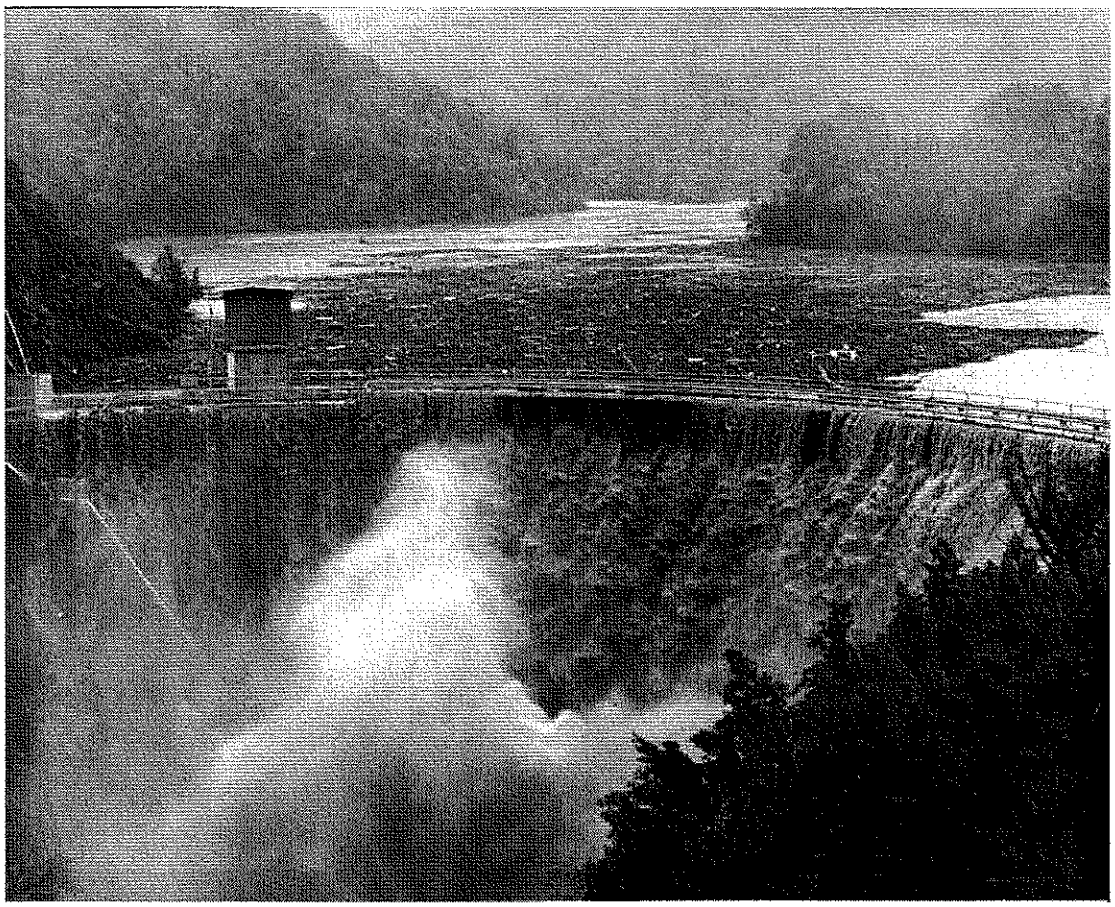
AA-27 What effect could the modification of the spillway to allow passage of large trees have on

downstream bridges and other infrastructure? Are there methods to reduce the impacts of large trees on downstream structures?

Since the dam was constructed in 1921, most of the large trees passing into the reservoir have been cut into small sections in order to pass through the spillway bays. Nineteen bridges currently span the river downstream of the dam. Seven are publicly maintained (one by CALTRANS, five by Monterey County Public Works Department, one by the Monterey Peninsula Regional Parks District). The remainder are privately owned and maintained. All the bridges have supports within the 100-year floodway. Ten bridges have center piers in the active channel. At bridges with supports in the active channel, the minimum open length between abutments and center piers ranges from a low of about 15 feet at the south abutment of Boronda Road Bridge to as large as 80 feet at the Rancho San Carlos Road bridge. Cranes or other equipment capable of picking up trees and logs are frequently stationed at five of the 19 bridges during high flows. Equipment operators generally pick up debris caught on the upstream side of piers and abutments and transfer it downstream. Because of the difficulty associated with this (forceful flows, difficult access), and the type of equipment used (small cranes or backhoes), the largest pieces that can be moved are in the 20 to 25-foot range (2-4 tons). Larger pieces require specialized equipment, such as a boomcrane and hook assembly. The remaining 14 bridges either don't have center piers and are usually debris-free, or are not accessible to cranes.

AA-27

A large amount of debris passes from the upper watershed through the river system and includes large trees, as shown in the photo below taken during the March 10, 1995 flood. The entire watershed of approximately 125 square miles above the dam contributes debris, although a small amount of debris becomes waterlogged and sinks near the Los Padres Dam spillway (note that the Los Padres Dam spillway is designed to be self-cleaning and passes a significant fraction of the debris from upstream).



AA-28

Page 3-25: Location of High-Level Outlet: Appendices I and J describe the location of a sluice port as being 10 feet laterally away from the fish ladder. This does not match the description on page 3-25 and is not shown in Figure 3.2-12 for the new fish ladder. The orientation of discharge from the 10-foot diameter sluice gate, located 10 feet from the entrance to the fish ladder, appears to impinge on the left downstream walls of the canyon. This orientation, while effectively designed for sluicing material away from the fish ladder, may threaten integrity of rock supporting the new ladder and result in significant impingement loss of any fish passing downstream. Mitigation measures are needed to ensure that no fish are in the vicinity of the gate when it is opened and the discharge should be directed away from the canyon walls.

FI-29

SED-26

Pages 3-25 and 3-26: The text briefly describes operation of dual high-level ports, but the modeling completed by Mussetter Engineering Inc. only examined the impacts and scenario of operating one of the ports. If the proposed sluice gates are shown correctly in Fig. 3.2-6, then the potential impacts from sluicing at each of the proposed levels should be reevaluated and effects

SED-26 such as headcutting in the reservoir sediments and release of fine material to downstream reaches should be identified. The FEIR/S should fully evaluate the timing, duration, and magnitude of sediment releases to the areas downstream of San Clemente Dam and the impacts to aquatic resources resulting from the discharge of sediment.

FI-30 The FEIR/S should fully evaluate how the ports would be operated in conjunction or separately, and the impacts of the operation on sediment mobilization, passage and deposition in the river below the dam should be evaluated and described. While a brief description of sluice gate operations is provided, the proposed schedule has not been combined with the reconstructed record of unimpaired flows to provide a full description of the frequency and duration of operation and how this will affect migration of adults and juvenile fish.

FI-31 The FEIR/S should document any previous attempts to sluice material from behind similar dams, while passing fish upstream and downstream. The FEIR/S should present enough information to the reader to be able to determine whether the proposed sluicing operations are a proven technology or are experimental.

AA-28 Page 3-26, page 3: Under electrical system. *"The existing structure would be replaced with a small pre-engineered building that would house the electronic controls for the outlet valves."* How would the system operate during a power failure at a time when the sluicing outlet valves are in an open position? Is auxiliary power proposed, or can the valves be operated manually?

FI-32 Pages 3-25 and 3-26: The text does not mention whether the outlet would be screened and how fish passage would be handled. If unscreened, the FEIR/S should evaluate how survival of fish would be affected as they pass through the sluice gates/valves.

AA-30 Page 3-28, Para 4: Under Access from Existing Gate to San Clemente Dam: This section contains vague statements or factual errors, including: 1) the description of the location of the high road and low road; 2) the Old Carmel River Dam bridge is described as 5,800 feet long (it appears to be no longer than about 100 feet); and 3) a lack of a Figure reference and confusion created by stationing call-outs with no visual reference.

AA-31 Page 3-29, Para 5: statement, "*The roadbed would be filled with sand and gravel and topped with crushed rock...*" Is there a potential for fill material to be mobilized during high flows? If so, only clean gravel and rock should be used, without the addition of fines.

GEN-14 Page 3-30, Para 4: Under Old Carmel Dam Fish Ladder Improvements, the last sentence should be modified to read, "The right bank contains an open passageway approximately 4 feet wide by 15 feet high that at one time was equipped with a gate and operated as a sluiceway and control to raise water levels for operation of a diversion. This structure was modified in 1992 and 2000 by removing several stoplogs and the gate structure from the passageway."

AA-32 Page 3-31, Para 2: Under San Clemente Dam Fish Ladder Replacement. "*For stream flows up to 55 cfs, all flow would pass through the proposed ladder.*" This design will encourage passage of fine grained sand and silt into the vicinity of ladder exit and hasten the need to sluice sediment from around the ladder exit and channel leading to the river. The FEIR/S should evaluate ways to mitigate this impact with a goal of having no impact on attraction of fish to the ladder entrance in the plunge pool.

FI-33

AA-33 Page 3-34, Figure 3.2-12, there is a note referencing water surface elevations in the upper pool of 527 feet at 700 cfs and 522 feet at 110 cfs, but these do not match proposed normal operating elevations referenced in other sections of the EIR/S. The FEIR/S should reevaluate all descriptions, operations and impacts that are based on these incorrect assumptions.

FI-34 Page 3-35, Para 1: "... *would be a consistent velocity of ~6.6 feet per second through the slot regardless of depth.*" This velocity may exceed the swimming capability of smaller, resident-type steelhead and affect passage success during drought periods, when the only fish attempting to pass are resident type fish. The FEIR/S should investigate, describe and include modifications to allow passage of smaller resident type fish under extremely low-flow conditions.

AA-34 Page 3-35, Para 2: The FEIR/S should document the actual elevation of the plunge pool and hydraulic control for this location. This will be important for all of the alternatives. For example, with the PPP the hydraulic control for the plunge pool needs to be set to prevent down-cutting below the bottom of the entrance pool. Considering the historical down-cutting at this site and the continued lack of coarse bedload with PPP, this project may require construction of a grade control below the ladder entrance, which is a typical feature at other sites where ladders are constructed below dams.

SED-28a Page 3-35, Para 3: Last Sentence, "*Dredging upstream of the fish ladder would occur on average every three years, where significant storm events might cause excessive build up and clogging of the upstream channel that cannot be cleared by sluicing alone (using the proposed sluiceway next to the fish ladder exit).*" The FEIR/S should provide detailed analysis and review of the studies that led to an average of every three years and clarify the frequency of dredging, which is not clear. Is this one day of dredging every three years, or multiple days every three years?

SED-28b What happens in years when sustained high flows result in rapid refilling of the area between the ladder exit and the sluiceway opening? Does dredging include maintaining the San Clemente Creek channel? The FEIR/S should fully evaluate operation and maintenance of channels leading from both San Clemente Creek and the mainstem to the fishway.

SED-28c

AA-35 Page 3-35, Para 5: Under Reservoir Maintenance, a reference to a Figure showing the dam and sluice pipes should be provided.

AA-36 Page 3-35, Para 5: Under Reservoir Maintenance. "*The automated operating mechanism and manual emergency crank will be located at the dam crest, where a physical connection to the gate via a threaded steel bar is turned to lift the gate for opening and closing.*" The EIR/S should review and evaluate the feasibility of providing a manual emergency crank which can be used to lift a 10-foot diameter steel gate by turning a threaded bar. This evaluation should include estimates of the time and staffing needed to manually close the gate.

AA-37 Page 3-36, Under Construction Schedule and Operations and page 3-38, Figure 3.2-14: The schedule needs to be updated. Is the Public Utilities Commission process for recouping expenditure of funds a critical component of completing a project?

FI-35 Page 3-39, Para 1: "*Fish rescue and drawdown of the reservoir and plunge pool would continue until about May 31.*" Additional detail should be added to provide rescue, trapping, and trucking of fish in upstream and downstream directions throughout the mobilization, construction and demobilization periods, except during high flow periods when streamflow makes trapping infeasible. In addition, the time periods between mobilization, Phase1, Phase 2 and demobilization may have features that affect fish passage, so the FEIR/S should specify mitigations for fish passage throughout the project period, not just when construction is scheduled.

SED-29a Page 3-40, Para 1: "*Accumulated sediment behind the dam would be removed down to the level of the notch.*" The portion that is coarse, including coarse sand, gravel, cobble and boulder should be sorted and remain in the reconstructed channel and floodplain for habitat restoration.

SED-29b In addition, removal of all material down to the level of the notch may result in an unstable or undesirable channel configuration through the remainder of the deposit. For the FEIR/S, a plan view, cross-sections, and a profile of the remaining reservoir deposits that show a geomorphically stable channel should be provided.

AA-38 Page 3-41, Para 1: "*Notching San Clemente Dam to approximately elevation 506 in the area of the existing spillway bays...*" The lower portion of the dam notch appears to be significantly wider than a channel that would be excavated through the sediment remaining upstream of the dam. The FEIR/S should show the transition (plan view, cross-sections, profile) between

SED-30 channels in the reservoir sediments, modified dam, and channel downstream. Does the configuration of the modified dam encourage the mobilization of sediment from behind the notched dam?

WAT-3 Page 3-44, Para 1: "*...the point of diversion would need to be replaced at a 525-foot elevation in the immediate vicinity of San Clemente Reservoir to avoid extensive improvements to the existing filter plan.*" Currently, Cal-Am is able to divert 1.4 cfs to the CV Filter Plant through the Russell Well field, without any improvements and the loss of pressure from San Clemente Dam. The FEIR/S should fully review the need for moving the diversion point upstream 6,000 feet and

NEPA/ CEQA-19

should describe potential impacts on habitat at the point of diversion and in the reach(s) affected by diversion. Alternatives to moving the diversion should be fully evaluated. These comments apply to other alternatives, including the No Project.

WAT-4

Page 3-44, Para 2: *"The screened intake would need to be constructed and maintained approximately 6,000 to 6,500 feet upstream of the dam."* The FEIR/S should describe Cal-Am's current right to divert flow at San Clemente Dam and whether Cal-Am needs to apply to the State Water Resources Control Board for a modification to move its point of diversion. Currently, Cal-Am is limited to direct diversion of 1,100 AF at San Clemente Dam. This is equivalent to a continuous direct diversion rate of ~3.1 cfs over a typical 180-day, six-month long dry season. If more than 1,100 AF is proposed for diversion at San Clemente Dam, Cal-Am would also need to modify its water right to increase the quantity of water diverted. This comment applies to all of the alternatives, except the No Project.

SED-31

Page 3-47, Para 1: *"Previous sediment transport modeling studies determined that removing or notching the dam and letting the river flush the sediments downstream in an uncontrolled manner would pose unacceptable risks for sediment accumulation and flooding in downstream reaches of the river."* MEI (2005) documents the quantity of sediment above elevation 506 and the amount of sediment that would build up in the river channel as a result of notching (120-140 AF at the end of the 41-year simulation (Figure 2.3, MEI[2005]). Considering this relatively small quantity of accumulated sediment, the FEIR/S should fully evaluate whether removal and storage of 930 AF of sediment is actually needed to mitigate for the long-term deposition of 120-140 AF in the river channel and whether the risk could be reduced to baseline conditions (No Project) by removing and storing significantly less material.

LAND-1

Page 3-48, Para 4: *"The use of site 4R as sediment disposal site and access easements would need to be negotiated with the District."* Are there land use restrictions currently in effect at this site? Does the Park District have plans or policies that would prevent the use of this site?

FI-36

Page 3-51, Para 5: *"A removable section would be disassembled annually to allow stream and fish passage during the non-construction periods."* The FEIR/S should describe additional mitigation that may be required for trapping and transporting fish past the construction zone at the temporary diversion facility, if channel conditions and habitat in the reach below the diversion are not suitable for juvenile residence and passage downstream during the non-construction season at low flows.

GEO-2

Page 3-54, Para 6: *"Improvement of the existing road would consist of widening the road to 20 feet (minimum width of 15 feet with turnouts for passing in tight reaches), improving the radius of curvature at sharper curves to allow passage of large trucks, and constructing a drainage ditch along the uphill edge of the road."* The existing roadway is very narrow at 10-12 feet in width and built on steep slopes that frequently wash out during the winter. The FEIR/S should

GEO-2 fully evaluate the erosion potential along the access road and include mitigation measures to minimize impacts from increased runoff and soil erosion.

AA-39 Page 3-56, Para 2: Statements on stream flow up to 55 cfs being routed through the ladder and dredging upstream of the fish ladder should be reviewed and updated per previous comments re:
FI-37 PPP on pages 3-33 to 3-35.

SED-32 Page 3-56, Para 3: *"Dredging upstream of the fish ladder would occur on average every three years, where significant storm events might cause excessive build up and clogging of the upstream channel that cannot be cleared by sluicing alone (using the proposed sluiceway next to the fish ladder exit)."*

Where are impacts and mitigations from the dredging described? What information was used to determine the frequency of dredging?

HY-6 p. 3-56 and 3-57 – a three-stage channel is proposed for the remaining reservoir sediments. The profile of the remaining sediments indicates that two very different channels would need to be constructed – one for a relatively steep channel in a narrow valley and one for a meandering channel in wide alluvial flat. No performance measures are suggested that would indicate how these channels would be monitored or maintained.

AA-40 Page 3-57, Para 3: Under construction schedule and operations, statements in the FEIR/S about the schedule for final engineering and beginning of construction should be revised based on the anticipated date of a selection of an alternative.

AA-41 Page 3-63, Para 1: "*Removal of the dam requires prior removal of the sediment accumulated in the reservoir to approximately the depth of the original streambed when the dam was placed in service in 1921.*" The low point of the pre-construction ground surface shown in Figure 3.3-2 is shown as 454 feet elevation. But, the existing excavation limit at the damsite is shown as extending down to elevation 435 at station 18 (1920 stationing) in the same figure. The FEIR/S should evaluate how the streambed will be reconfigured and stabilized at the toe of the existing dam considering that the existing excavation limit is ~ 20 feet lower than the original streambed level.

FI-38 The Draft EIR/EIS does not describe impacts to rearing habitats in the river channel within the existing inundation zone of SCR. The FEIR/S should address the potential for temporary, mid-term and long-term habitat gains/losses in inundation zones along the mainstem and San Clemente Creek.

WAT-5 Pages 3-72, Para 4: statements regarding moving the diversion point at San Clemente Dam and maintaining a maximum diversion rate of 16 cfs from a new diversion point upstream of rerouted

WAT-5 dam should have the same review, evaluation and potential actions by the SWRCB, as notching alternative. The FEIR/S should address similar issues as per comments on page 3-44, Para 1 & 2.

AA-42 Page 3-73, Para 5: "*Sediment would be removed to approximately the depth of the original streambed that existed in 1921.*" This should be reconciled with the cross-section in Figure 3.3-2 that shows the original bed was excavated approximately 20 feet lower when San Clemente Dam was built in 1921. The FEIR/S should review and evaluate how the lowered section at the damsite will affect sediment transport, especially in the vicinity of the confluence with San Clemente Creek and the toe of the new sediment plug in the old river channel.

HY-7 Page 3-80, Para 1: "*The channel profile and section in Figure 3.5-3 show only the general geometry of the channel construction as used in the MEI hydraulic analyses...*" The referenced figure shows the profile of the haul road. The FEIR/S should provide full documentation of the proposed channel geometry through the diversion channel and the post-project channel in the post-project San Clemente Creek channel downstream of the diversion channel.

SED-33 Page 3-80, Para 1: "*The channel profile...includes a diversion sill at the channel upstream El. 530 to minimize downstream sediment transport and a slightly steeper slope than the natural geometry.*" What portion of the gravel, cobble and boulders stored upstream of this location in the mainstem would be mobilized and pass downstream? Would a sill limit future recruitment of beneficial substrate (material coarser than sand) and for how long? How would dynamic equilibrium be established with a sill in place? The FEIR/S should fully evaluate effects on spawning and rearing habitat in the reach below the diversion sill and the time period before natural recruitment of gravel begins to pass this location. If the reroute alternative is the selected project, mitigation measures should include removal and storage of gravel and cobble in the old inundation zone of San Clemente Reservoir to be placed into the diversion channel.

SED-34 FI-39

SED-35

AA-43 Page 3-80, Para 3: "*The 200-foot wide by 3-foot thick by 40-foot deep soil cement cutoff wall will be constructed to bedrock to prevent undermining and seepage of river flows below the diversion dike.*" How will a high phreatic water surface be maintained in the old sediment layers immediately upstream of San Clemente Dam, which is described on page 3-75 Para 3 as a project goal? The FEIR/S should fully evaluate how the existing wetlands will be maintained given the lack of seepage past the diversion dike and the 550 foot elevation of the proposed sediment disposal area. Based on the distribution of habitat types in the existing inundation zone, it is more reasonable that the higher elevation of new sediments in the disposal zone and lack of seepage from the old river channel, will severely limit distribution of phreatic zones and reduce wetland coverage in the project area. This should be fully evaluated in the FEIR/S and adjustments made to estimates of jurisdictional wetlands.

WET-5

Page 3-81, Para 5 & 6: "*The San Clemente Creek stream channel would be exposed and require reconstruction.*" The reconstructed channels described in Section 3 are not likely to be suitable for construction through the San Clemente Creek arm of the reservoir. The entire flow from the Carmel River mainstem, plus natural flows in San Clemente Creek must be routed through a reconstructed channel. Further, it is not clear why it would be necessary to excavate in the San Clemente Creek arm down to the pre-1921 level, except at the confluence with the mainstem. It is quite likely that the historic creek configuration near the bottom of the valley would be too narrow and would not be stable enough geomorphically to handle the increased flow. Instead, a wider channel at a higher level would probably be required to pass the combined flow of the creek and mainstem.

HY-8

Chapter 4.0 Geology and Soils

Page 4-5 Regional Seismicity. The third paragraph cites the Converse Consultants 1982 report as evidence that the Cachagua Fault zone is not active. This discussion should reference a more recent study of the Cachagua Fault that was conducted for MPWMD as part of geotechnical investigations for the New Los Padres Reservoir Project. Pertinent discussion is found in the final report titled Geotechnical and Engineering Studies for the New Los Padres Water Supply Project (The Mark Group, March 16, 1995, see page 5-8).

GEO-3

Page 4-6 Table 4.1-1: Estimated Peak Acceleration of Specific Faults. The estimated peak horizontal acceleration for the named nearby faults is based on a calculation methodology from 1981 (see footnote 3), which may not adequately reflect revisions for more recent seismic events, including the Loma Prieta (1989) and Northridge (1994) events. These calculations should be revisited to ensure that the selected seismic design criteria are appropriate and consistent with more current methodology.

GEO-4

Page 4-13 Alternative 3 (Carmel River Reroute and Dam Removal). Issue GS 4: *Soil Erosion*, briefly discusses the risk of erosion along access road improvements, in sediment disposal areas, and from sediment and rock discharges to streams. However, no discussion is given to assess the potential for destabilization of slopes resulting from the erosive forces of the Carmel River over the course of its rerouting through the San Clemente Creek channel. More specifically, what is the significance of the potential for high-river flows along the San Clemente Creek channel to destabilize the base of the channel slopes and possibly produce rockfalls, landslides or debris flows that could partially or completely block the channel, and result in impoundment of the river behind such a blockage?

GEO-5

HY-9

Page 4-17, fourth paragraph. "*The distribution of sediment downstream of the dam as a result of sluice gate operations was not modeled for the Proposed Project or Alternative 1...but MEI stated that downstream impacts under the Proposed Project with the implementation of the sluice gate would be similar to impacts simulated for Alternative 1 (Dam Notching) (MEI pers.*

SED-36

SED-36 *comm. March 2006).*" Appendix I states "*... that quantitative sluicing modeling was performed for the Proposed Project.*" Please clarify and resolve these statements.

HY-10 Page 4-19, Para 4. While the theoretical peak capacity of the spillway may be 20,300 cfs, the actual capacity is much less, due to debris flow that often blocks ports during high flows (see comment on Page 3-24 and picture above).

HY-11 Page 4-20 to 4-23, Table 4.2-2. It appears that the table shows the maximum peak mean daily flow in cfs, while the title of the table seems to indicate that this is a monthly rate. USGS reports flows on a mean daily basis. Please also review text on page 4-19 that discusses monthly flows. Should this be mean daily flows?

Page 4-25, bottom para. "*Sluicing would transport gravels as well as fine sediments downstream. The composition of the sediment loads would be similar under the Proponent's Proposed Project, Alternative 1 and Alternative 3. An increase in the transport of coarse sediment would occur, and would be beneficial for downstream fish and riparian habitats.*"

SED-37 Sluicing under the PPP and Alternative 1 is proposed at flows of 300 to 700 cfs and fine material will continue toward, and presumably down, the fish ladder at flows of less than 50 cfs. Under both Alternative 2 and 3, sediment would be transported according to the available stream power, with no restrictions or artificial barriers. How can the composition of sediment loads to the downstream reaches under the PPP, Alternative 1, and Alternative 3 be similar when sluicing operations cease at flows greater than 700 cfs while sediment will continue to be routed through the bypass at flows up to the PMF?

TE-12 Page 4-211, first paragraph. "*Construction activities could result in loss of **663** acres of oak woodlands protected by the Monterey County Oak Protection Ordinance in the area mapped in 2005.*" However, Table 4.5-1 states that only **66.4** acres of oak woodlands may be affected by dam removal.

TE-13 Page 4-211, fourth paragraph. "*The acreage of vegetation cover type that would be lost as a result of Alternative 2 implementation is provided in Table 4.5-1. The total acreage of vegetation that would be lost in the area mapped in 2005 is 131 acres.*" However, Table 4.5-1 shows that the total vegetation that may be affected is 140.4 acres. Are these numbers supposed to match?

NEPA/ CEQA-20 Chapter 5, Section 5.3.3, page 5-12, Seaside Basin Injection/Recovery Project:
The text incorrectly states in line 9 that: "*The environmental effects of this project have not been analyzed; however, analysis conducted for the 2000 RDEIR concluded that the well and pipeline portion of the project would have relatively minor construction impacts .....* [continues]"

Instead, the text should say:

NEPA/ CEQA-20

The environmental effects of Phase 1 of the MPWMD Aquifer Storage and Recovery (ASR) Project have been analyzed in a Draft EIR/EA released in March 2006; a Final EIR/EA is anticipated to be certified by the MPWMD Board in August 2006. The Phase 1 project entails a second injection well at the MPWMD's existing Santa Margarita Test Injection well site on the former Fort Ord, using existing CAW facilities, with the exception of a new CAW temporary pipeline that is planned for construction in Fall 2006. Subsequent phases would be the subject of separate future environmental review, and depend on the progress of other regional water supply projects described in this chapter. The DEIR/EA concluded that the well and pipeline portion of the project would have relatively minor construction impacts; operation of the project would have beneficial effects on the Carmel River hydrology and dependent fish and wildlife. [Note: All remaining existing text starting with "*however, analysis conducted for the 2000 RDEIR concluded that…..*" should be deleted].

Chapter 5, Section 5.3.3, page 5-13, MPWMD Sand City Desalination Plant. The following text should be added to the end of the existing paragraph:

NEPA/ CEQA-21

An administrative draft EIR was prepared by MPWMD and reviewed by its Board in December 2003. At that time, completion of a public Draft EIR was delayed until additional studies on seawater intake and brine discharge technology could be completed. In March 2004, the MPWMD Board determined that it would not pursue the desalination project, pending review of regional desalination projects in Moss Landing that had been proposed. As of June 2006, MPWMD has updated cost information for the desalination project, but is not actively pursuing the project.

From Appendix I -
SLUICING OPERATIONS EVALUATION

Page 7
"…a minimum of 15 to 20 days would be required for the sediment deposits in the incised channel to prograde to the vicinity of the fish ladder inlet."

Page 9

SED-38

"8. Evaluation of the rate at which the incised channel will refill after the sluice gate is closed at the end of each sluicing period indicates that at relatively low discharges in the range of 30 to 50 cfs, the sediment deposits may prograde to near the fish ladder inlet within 5 to 7 days.

9. The results in the previous item represent conditions after the first few sluicing operations. After repeated operations, the incision will likely progress even farther upstream than is

indicated by the analysis presented here, which should increase the time before sediment begins to affect the fish ladder during non-sluicing periods."

From Appendix J -
SLUICING OPERATIONS AND MAINTENANCE PLAN

Page 3 - DATA ANALYSIS AND FORMULATION OF OPERATION & MAINTENANCE PLAN:

"... the sluicing envisioned on the Carmel River would occur over several hours once or twice a year."

SED-38 MPMWD Comment: Although no definitive estimate is given of how long it would take for sediment to prograde to the fish ladder after several sluicing operations have been completed, it is apparent that flows in the 30-50 cfs range have the ability to cause sediment deposits to prograde rapidly toward the fish ladder after a sluicing event. These flows occur between 40% and 50% of the time during the period December 1 to May 31 (Figure 5, Appendix I) or between 72 and 90 days per year, on average. There would appear to be numerous opportunities for sediment to move toward the fish ladder, while the number of days for optimum sluicing conditions is much lower at 13 to 27 (i.e., between 300 and 600 cfs as flow is rising or between 7% and 15% of the time).

The analysis in Appendix I and the operations proposal in Appendix J does not address the low flow condition (30-50 cfs) where sediments rapidly prograde to the fish ladder in as little as five days with no storms on the horizon to maintain the ladder in a sediment-free state.

GEN-15 Comment on the following reference: Mussetter Engineering Inc. 2006b - Summary of Hydraulic and Sediment-transport Analysis of Residual Sediment: Options for the San Clemente Dam Removal/Retrofit Project, California

FI-40 Page 26, Figure 16 – This figure indicates that for the notching option, at flows above the two-year level (2,250 cfs), velocity just downstream of the dam would exceed 50 fps or more than 34 mph, which is close to the velocity associated with free fall. What is the estimated mortality rate of adult and juvenile steelhead during this type of fall when they are migrating downstream?

Other General Concerns

TE-14 What guidelines and/or conditions are proposed to ensure replacement of riparian vegetation and other mitigation associated with the construction of the Tularcitos Access Road?

TE-15 If the re-route alternative is selected, demolished dam debris should be covered with native

TE-15

material to give the area a more natural look and provide a medium for vegetation to establish.

Thank you for your consideration of these comments. If you have questions about this letter, please contact Larry Hampson, MPWMD Water Resources Engineer, in the Carmel Valley field office at (831) 659-2543.

Sincerely,

David A. Berger
General Manager

cc: MPWMD – Bell, Hampson, Stern, Christensen, Oliver, Dettman, and Fuerst

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June 30, 2006

In response refer to:
150308SWR2006SR00179:BLS

Robert Smith, Project Manager
U.S. Army Corps of Engineers
San Francisco District
333 Market Street, 8th Floor
San Francisco, California 94105-2197

Dear Mr. Smith:

NOAA's National Marine Fisheries Service (NMFS) thanks you for the opportunity to comment on the April 2006 Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) for the San Clemente Dam Seismic Safety Project on the Carmel River, Monterey County, California. The Draft EIR/EIS analyzes California American Water Company's Proposed Project (dam strengthening) and four alternatives. By letter dated April 5, 2006, NMFS provided comments on the December 2005 Administrative Draft Environmental Impact Statement Report for the San Clemente Dam Seismic Safety Project EIR/EIS. NMFS requests those comments as well as the enclosed comments (Enclosure) be addressed in the Final EIR/EIS.

As stated in the Draft EIR/EIS, California American Water Company has applied to the U.S. Army Corps of Engineers (Corps) for authorization to deposit approximately 3,200 cubic yards of fill material into waters of the U.S. to strengthen the San Clemente Dam. The Proponent's Proposed Project (and Alternative 1: dam notching with partial sediment removal) includes the use of sluice gates to regulate downstream sediment releases. This application is being processed under Section 404 of the Clean Water Act.

NMFS is providing comments on the Draft EIR/EIS pursuant to our authority under the Federal Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*), the Fish and Wildlife Coordination Act (FWCA), and the National Environmental Policy Act (NEPA). A purpose of this letter and our enclosed comments is to offer the Corps our technical expertise to facilitate the conservation and protection of trust resources and to streamline the regulatory process. NMFS has provided technical assistance pursuant to the ESA to the Corps as early as 2000 regarding the San Clemente Dam Seismic Safety Project. Steelhead (*Oncorhynchus mykiss*)

in the Carmel River are part of the Federally threatened South-Central California Coast (S-CCC) steelhead Distinct Population Segment (DPS). The Carmel River is designated critical habitat for S-CCC DPS steelhead.

The Corps is solely responsible for making final permit decisions pursuant to Section 404(a) of the Clean Water Act (33 U.S.C. 1344). Section 7(a)(1) of the ESA makes it clear that all Federal agencies have the responsibility for the conservation and recovery of listed threatened and endangered species. The FWCA provides that fish and wildlife resources are to receive equal consideration and be coordinated with other features of Federal projects and projects carried out under Federal permits and licenses that control or modify any bodies of water for any purpose. Section 1505.2(b) of NEPA requires that, in cases where an EIS has been prepared, the Record of Decision must identify all alternatives that were considered, "... specifying the alternative or alternatives which were considered to be environmentally preferable."

FI-42 As you may know, the current run-size for the entire S-CCC DPS is estimated be approximately 500 adults per year, which represents a decline of over 90 percent of the historic run-size. The percentage decline of the Carmel River steelhead run is likely greater. NMFS has determined the already severely depressed Carmel River steelhead run cannot be allowed to decline further if recovery of the S-CCC DPS is to be achieved.

FI-43 On August 11, 1992, a *Memorandum of Agreement Between the Department of Commerce and the Department of Army* was signed pursuant to Section 404(q) of the Clean Water Act. A purpose of this memorandum is to provide the exclusive procedures for the elevation of specific individual permit cases. Based on our review of the Draft EIR/EIS, our knowledge of river dynamics, and our technical expertise regarding listed salmonids, NMFS expects the Proponent's Proposed Project and Alternative 1 may result in substantial and unacceptable impacts to the Carmel River and would likely request the Corps to deny California American Water Company's permit as proposed.

FI-44 Based on our review of the Draft EIR/EIS, implementing the Proponent's Proposed Project or Alternative 1 will result in long-term adverse effects to all steelhead lifestages, including annual mortality, delayed adult migration and long-term degradation of the habitat downstream of San Clemente Dam that supports all lifestages of steelhead. NMFS's most significant concern is the adverse effects to steelhead and degradation of their critical habitat that would occur for as long as the San Clemente Dam remains in place and management of sediment (*i.e.*, sluicing) is conducted.

Our enclosed comments and detailed involvement since 2000 have provided the Corps the assistance necessary to develop and determine environmentally preferable alternatives. As stated

SED-41 in our April 5, 2006, letter, NMFS believes the use of sluice gates as proposed in the Proponent's Proposed Project and Alternative 1 is a fatal project flaw. The Draft EIR/EIS notes San Clemente Dam and Reservoir were never intended for flood control and the San Clemente Dam Seismic Safety Project has neither flood storage nor flood operations criteria. The Draft EIR/EIS also notes San Clemente Reservoir does not provide water storage for the California American Water

AL-10 Company system and the Proponent's Proposed Project will not improve current or future water storage. A dam and reservoir that provides neither flood storage nor water storage, commensurate

AL-10 with the long-term adverse environmental impacts associated with operating and maintaining the dam, make it clear to NMFS that Alternative 2 (dam removal) or Alternative 3 (Carmel River reroute and dam removal) are the environmentally preferable alternatives. Implementation of the Proponent's Proposed Project or Alternative 1 will likely jeopardize S-CCC DPS steelhead and destroy designated critical habitat of S-CCC DPS.

If you have any questions regarding this letter or our comments, please contact Mr. Bill Stevens at (707) 575-6066.

Sincerely,

Dick Butler
Santa Rosa Area Office Supervisor
Protected Resources Division

Enclosure

cc: Rod McInnis, NMFS, Long Beach
Russ Strach, NMFS, Sacramento
Lt. Colonel Philip Fier, U.S. Army Corps of Engineers, San Francisco
Jane Hicks, U.S. Army Corps of Engineers, San Francisco
Dave Gutierrez, California Department of Water Resources, Sacramento
Paula Landis, California Department of Water Resources, Fresno
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Summer Allen, U.S. Environmental Protection Agency, San Francisco
David Berger, Monterey Peninsula Water Management District, Monterey
Monica Hunter, Planning and Conservation League Foundation, Salinas
Trish Chapman, California Coastal Conservancy, Oakland
Roy Thomas, Carmel River Steelhead Association, Monterey

Enclosure

National Marine Fisheries Service's (NMFS) Comments on the April 2006 Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) for the San Clemente Dam Seismic Safety Project on the Carmel River, Monterey County, California

June 30, 2006

South-Central California Coast Distinct Population Segment Steelhead

The Draft EIR/EIS recognizes the protected status of the Carmel River steelhead population, but does not fully reflect the importance of the population to the South-Central California Coast
FI-45 (S-CCC) Distinct Population Segment (DPS). Restoring the Carmel River steelhead run is expected to play an essential role in the recovery of the S-CCC DPS, and its eventual delisting, but the Draft EIR/EIS does not acknowledge this.

The Draft EIR/EIS provides only the most recent run-counts in the Carmel River and does not provide any historic context in which to assess the size of these most recent runs, either within the Carmel River itself or in the S-CCC DPS, of which the Carmel River is a part. The original[1] and most recently up-dated[2] NMFS's Status Review for Environmentally Significant Units of West Coast Salmon and Steelhead have reported that the historic run size of the Carmel River in 1928
FI-46 was estimated by the California Department of Fish and Game at 20,000 adults per year, which is the largest steelhead run in the S-CCC DPS. The current run-size for the entire S-CCC DPS is estimated to be approximately 500 adults per year, which represents a decline of over 90 percent of the historic run-size. The percentage decline of the Carmel River steelhead run is likely greater. Analysis in the Draft EIR/EIS fails to demonstrate that the Proponent's Proposed Project and Alternative 1 will not further the decline of the Carmel River steelhead run.

As part of the recovery planning for the S-CCC DPS, the Carmel River has been consistently ranked by NMFS as the most potentially viable steelhead watershed. NMFS has determined the already severely depressed Carmel River steelhead run cannot be allowed to decline further if recovery of the S-CCC DPS is to be achieved. Section 7(a)(1) of the Federal Endangered Species Act (ESA) makes it clear that all Federal agencies should participate in the conservation and
FI-47 recovery of listed threatened and endangered species.

The Carmel River has been designated as critical habitat for S-CCC DPS steelhead. The Carmel River downstream of San Clemente Dam supports a significant portion of the juvenile steelhead

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[1] Busby, P.J., T.C. Wainwright, G.J. Bryant, L.J. Lierheimer, R.S. Waples, F.W. Waknitz, and I.V. Lagomarsino. 1996. Status of West Coast steelhead from Washington, Idaho, Oregon, and California. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-27.

[2] Good, T.P., R.S. Waples, and P. Adams, editors. 2005. Updated status of Federally listed ESUs of West Coast salmon and steelhead. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-66.

rearing in the lower Carmel River. The Draft EIR/EIS identifies significant adverse impacts to steelhead spawning and rearing habitat below San Clemente Dam associated with the sluicing of the reservoir to maintain effective operation of the reconstructed fish passage facilities. These include the repeated discharge of concentrated levels of finer sediments which would adversely affect steelhead habitat downstream.

The mitigation identified for this significant adverse impact consists of "minimizing impacts on steelhead" and a further evaluation "to determine effects on downstream channels, habitat and fishes". This proposed mitigation is flawed in two fundamental respects. First, the proposal to further evaluate adverse effects of the proposed sediment sluicing operation on the downstream channel, habitat and fishes is not itself mitigation, and such proposals have been consistently rejected in judicial review under the California Environmental Quality Act (CEQA). Second, there is nothing in the protocols for the sluicing operations and management plan which clearly indicates to what level the impacts associated with this aspect of the proposed project would be reduced.

FI-46a

FI-47

FI-47b

Given the existing severely depressed populations of steelhead in the Carmel River, and the role of the Carmel River in the recovery of the S-CCC DPS, the vague mitigation measure proposed is not adequate to make a determination of "no significant impact". Further, a finding supporting a statement of over-riding considerations must address both the threatened status of the S-CCC DPS and the expected role the Carmel River will have in the recovery and delisting of the DPS.

FI-47c

FI-47d

One of CEQA's main objectives is to require agencies to avoid or reduce the environmental effects by implementing feasible alternatives or mitigation measures. One of the purposes of the ESA is to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved. The Carmel River steelhead run is critical to the recovery of the S-CCC DPS. A proposed project alternative that results in the perpetual adverse modification of designated critical habitat, as well as perpetual take of listed species is inconsistent with CEQA, as well as the ESA and the recovery needs of the S-CCC DPS.

NEPA/ CEQA-22

FI-47e The Final EIR/EIS should: (1) address the fact that the severely depressed steelhead run in the Carmel River is one of the principal reasons the S-CCC DPS has been listed by NMFS as

FI-47f threatened under the ESA; (2) include a discussion on the long-term adverse impacts to listed steelhead (by direct mortality), fish passage and habitat downstream from the long-term sluicing

FI-47g operations as part of the Proponent's Proposed Project and Alternative 1; (3) address how the Proponent's Proposed Project and all of the alternatives will affect the restoration of the Carmel

FI-47h River steelhead run; and (4) provide analyses that demonstrate the Proponent's Proposed Project and Alternative 1 will not further the decline of the Carmel River steelhead run.

Effects of sediment discharged downstream of the San Clemente Dam from slucing operations

The analysis of the sluicing operations' impacts downstream of the dam focuses on the physical behavior of the sediments. However, the analysis does not specifically address the impacts on fisheries or other aquatic resources. This lack of analysis is significant because it is principally the effects of discharged sediments (particularly fine sediments) in an artificial manner (timing, amount, duration and composition) on aquatic resources that is the focus of the CEQA analysis. In

FI-48

addition to steelhead, potentially impacted aquatic resources include benthic invertebrates and rooted aquatic vegetation.

FI-48

The characterization of the sediment sluicing operations as causing only a "short-term increase in the sediment load to the downstream river" is misleading. While the immediate principal impacts of the sediment sluicing may be concentrated in a relatively short period each year, the sluicing operations are proposed in perpetuity and will be necessary in perpetuity, or at least for as long as the San Clemente Dam is in place. Consequently, the real impacts can only be evaluated on a cumulative basis. At a minimum, adult steelhead migrating upstream, benthic invertebrates, incubation of steelhead alevins, rearing/feeding of juvenile steelhead and steelhead spawning in the lower reaches of the Carmel River downstream of the San Clemente Dam will be adversely impacted in perpetuity by the sluicing operations.

FI-49

The Proponent's proposed standard regarding the timing of sediment sluicing (*i.e.*, ceasing sediment sluicing if 20 or more steelhead have passed the ladder in the previous two days) is arbitrary. Since it is arbitrary, the proposed standard could conflict with the basic objective of sediment sluicing: control sediment build-up in the river channel in the reservoir immediately above the San Clemente Dam to facilitate adequate steelhead passage opportunities through the fish ladder. It bears mention that in some years the number of steelhead proposed as the "cease sluicing standard" has constituted a significant portion of the total Carmel River steelhead run in a single month.

FI-50

As noted in the Sluicing Operations and Maintenance Plan, high turbidity and suspended sediment are potentially the most significant hazards to adult steelhead migrating up the Carmel River. Swimming performance of adult (and juvenile) salmon can be impaired by poor water quality. Migrating salmonids avoid waters with high silt loads, or cease migration when such loads are unavoidable. A large portion of the Carmel River adult steelhead population would be exposed to these effects based on the estimate that about one half (55 percent) of the adults that enter the Carmel River may move upstream of the San Clemente Dam.

FI-51

When water quality conditions are impassable to fish, their upstream movement is delayed for as long as that condition persists. Delayed fish may expend the stored energy necessary for successful migration, maturation and spawning before reaching their destination, resulting in weakened fish more disposed to disease or pre-spawning mortality. Delayed adult upstream migration is another stressor added to a population that has already declined significantly.

FI-52

The Draft EIR/EIS notes that suspended sediment levels as a result of sluicing would impair the ability of steelhead to see and feed, would impair homing, delay migration and cause physiological responses ranging from stress to death depending on the level of suspended sediment and duration of exposure. Larval steelhead and eggs would also be affected. These effects to all steelhead life stages will occur in perpetuity and the Draft EIR/EIS fails to analyze these effects to the Carmel River steelhead population in perpetuity. For instance, adults, juveniles, eggs and larval steelhead may experience severe habitat modification and up to 40 percent mortality. The proposed mitigation (*e.g.*, the Sluicing Operations and Maintenance Plan and an evaluation to determine downstream effects) is insufficient to mitigate the high levels of mortality and severe habitat degradation that will occur in perpetuity.

FI-53

The Sluicing Operations and Maintenance Plan notes steelhead throughout their range frequently encounter migratory obstructions (*e.g.*, beaver dams, cascades, logjams) which delay migration, but that such delays usually don't affect the ultimate reproductive capacity of the fish. NMFS agrees that relatively small natural barriers are well adapted to by steelhead. However, the scale of the proposed sluicing operations and the resultant effects downstream – high turbidity and suspended
FI-54 sediment – are profoundly unnatural in the Carmel River.

Beaver dams and logjams are likely temporal obstructions. The sluicing operations are proposed in perpetuity and will be necessary in perpetuity, or at least for as long as the San Clemente Dam is in place. Therefore, delays to adult migration will occur for as long as sluicing operations are conducted.

NMFS participated in the detailed sediment transport analysis conducted after the August 2000 Draft EIR/EIS was submitted. That Draft EIR/EIS also proposed dam strengthening and sluice gates. NMFS' significant commitment during those sediment transport studies was primarily to
SED-42 ensure dam removal was given adequate examination. NMFS was also establishing a systematic methodology for future analysis regarding the San Clemente Dam. NMFS expects that level of analysis for the proposed sluicing operations, but the Draft EIR/EIS does not include those results.

The results of a defendable systematic analysis would include suspended sediment concentrations from the dam to the ocean for a full range of hydrologic conditions. Suspended sediment in the
NEPA/ water column, as well as habitat alteration, would be addressed. The Draft EIR/EIS has taken an
CEQA-23 unacceptable short cut in analyzing a project that proposes to adversely effect – in perpetuity – the most essential steelhead run in the S-CCC DPS.

Sluicing Operations and Maintenance Plan

The Proponent's Proposed Project and Alternative 1 will require the San Clemente Dam to continue to store sediment. Stored sediment in the reservoir will continue to be a steelhead passage impediment above the ladder. The flaws within the Sluicing Operations and Maintenance Plan are
SED-43 that actual sediment sluicing operations are likely to vary considerably, depending on the sediment delivery events to the reservoir and sediment deposition patterns in the reservoir. With the continued filling of the reservoir with sediment, NMFS expects there will be a braided channel near the upper end of the reservoir that will further impair steelhead passage.

The Draft EIR/EIS states sluicing is expected to occur two-to-three times per year based on the number of flow events that occur over the winter and the length of the (steelhead) migration season, while the Sluicing Operations and Maintenance Plan states sluicing would occur over several hours once or twice a year, yet Appendix I states that aggradation would prograde near the fish ladder
SED-44 inlet in 5-20 days, depending on stream flow. NMFS infers from Appendix I that sluicing may be required more frequently than one-to-three times per year. Therefore, based on the information in Appendix I, it is unclear how sluicing as described in the Draft EIR/EIS and the Sluicing Operations and Maintenance Plan meets the basic objective of sediment sluicing: control sediment build-up in the river channel in the reservoir immediately above the San Clemente Dam to facilitate adequate steelhead passage opportunities through the fish ladder.

FI-55 The Draft EIR/EIS notes that the first storms of the season and the first opening of the Carmel River lagoon sandbar control the initial adult steelhead upstream migration.

FI-56 The Draft EIR/EIS states that, "(i)deally, the first sluice event for a given year would occur prior to the initial (adult upstream) steelhead migration, depending on the timing of storms." It is unknown in how many years the first sluice event will occur prior to the initial steelhead migration. NMFS is concerned that adult steelhead migrating upstream will be affected by the first (and all) sluicing events as there is no certainty in predicting when sluicing events will occur and no assurance that initial adult upstream migrants will not be present during the first sluicing period in any given year.

SED-45 The Mediterranean climate of the Carmel River Valley is prone to seasonal, prolonged and severe droughts. Wildfire and flooding are also part of the Carmel River watershed processes. The Carmel River watershed generates and stores sediment during normal or low-flow years and the river depends upon high flows for extremely high transport rates during wet years. Therefore, the Draft EIR/EIS use of average hydrologic conditions when analyzing the downstream effects of sediment sluicing and for the design of the Sluicing Operations and Maintenance Plan is inappropriate. NMFS is concerned how the Sluicing Operations and Maintenance Plan will be implemented in dry and wet years.

SED-46 Although the Sluicing Operations and Maintenance Plan includes a Proposed Sluicing Decision Tree, the decision-making processes of how often to sluice and the determination of whether a sluicing event was successful have not been adequately described. For instance, the criteria of whether flows that are increasing are likely to exceed 300 cubic feet per second (cfs) have not been described. The criteria for determining whether "storm precipitation predicted to be significant" have not been described. Also lacking are the real-time methodologies and criteria for measuring and monitoring the incision goal.

NMFS has determined the Proposed Sluicing Decision Tree in the Sluicing Operations and Maintenance Plan is too simplistic and does not account for all the unforeseen and unpredictable events that can occur each year. Each step in the Decision Tree asks questions that are difficult, if not impossible, to answer accurately. Questions raised for each step follow:

SED-47a *Is sediment delta passage a problem?*

SED-47a How will passage problems be determined? When will it be determined when sluicing is to occur? Making a determination before the winter migration period may be inaccurate due to changing conditions behind the reservoir once high flows begin. Please clarify how channel depth and width within the reservoir will be measured during the high flow season in order

SED-47b to initiate sluicing. Since steelhead tend to migrate on the descending limb of a storm, how

FI-57a feasible and safe is it to place crews out on the reservoir to measure channel dimensions during storm events?

SED-47b If sediment delta passage is a problem, but increasing flows are predicted not to exceed 300 cfs, sluicing will not occur. However, passage has already been determined to be impacted.

FI-57b How will fish pass through the blocked sediment delta during their migration before a sluice event has been performed? These delays need to be addressed.

SED-47c
FI-56c

Is it peak migration season?
Peak migration season is generally between February and March, however, it depends on the hydrologic cycle as to when the majority of fish migrate.

SED-47d
FI-57d

Will a passage problem potentially develop during the next storm event?
How will this be determined? It is unknown how large or small the next storm event will be and how much sediment will be carried into the reservoir.

SED-47e
FI-57e

It has already been determined that passage is a problem in the first step. But if a significant storm event is not predicted, sluicing will not occur and blocked passage will continue to delay migration.

SED-47f
FI-57f

Have 20 or more fish ascended the ladder in the past 2 days?
Per our April 5, 2006, letter, NMFS believes the decision whether 20 or more fish have ascended the ladder is an arbitrary number. Please clarify how this number was determined to be a defining point to sluice or not.

SED-47g
FI-57g

If this number of fish has ascended the ladder, sluicing will not occur even though a passage problem potentially will occur during the next storm event. This is a large number of steelhead to be trapped in the sediment delta without being able to move upstream. The impact of delay to these fish needs to be addressed.

SED-47h
FI-57h

Increasing flows likely to exceed 300 cfs?
Future hydrologic conditions are very difficult to predict. Basing management decisions (when sluicing is to occur) on unpredictable occurrences is unacceptable.

SED-47i
FI-57i

Storm precipitation predicted to be significant?
See comment above. Although predicting storm events is becoming easier, storm intensity is unknown until the storm is actually occurring.

SED-47j
FI-57j

Is flow still increasing past 300 cfs?
How long does it need to keep increasing past 300 cfs? This is unpredictable.

SED-47k
FI-57k

Continue sluicing until time limit, incision goal, or flow limit is reached.
What is the time limit for sluicing? Please clarify how channel depth and width within the reservoir will be measured during the high flow season in order to determine that enough sediment has been sluiced to provide for passage. What is the flow limit?

SED-47l
FI-57l

If flow is not increasing past 300 cfs, abort, re-open fish ladder.
How many aborted sluicing events will occur causing unnecessary delay to fish migration throughout the season due to the inability to predict hydrologic events to induce sluicing?

General Comments

FI-58

Referring to Table 2.1, FI-4, NMFS recommends adding "short-term" to impacts under Alternatives 2 and 3.

FI-59 Referring to Table 2.1, FI-7, NMFS recommends adding "long-term, significant, unavoidable" to impacts under the Proponent's Proposed Project.

FI-60 Referring to Table 2.1, FI-7, NMFS recommends adding "short-term" to impacts under Alternatives 1, 2 and 3.

FI-61 Referring to Table 2.1, FI-8, NMFS recommends FI-8 should include sluicing impacts on upstream fish migration. For the Proponent's Proposed Project and Alternative 1, it would be long-term unavoidable significant impacts, as well as beneficial with new fish ladder. NMFS suggests F1-8 may need to be separated into two separate impacts: sluicing impacts on upstream fish migration and beneficial effects of a new fish ladder.

FI-62 Referring to Table 2.1, FI-9, NMFS recommends FI-9 should include only sediment impacts to channels downstream (*i.e.*, impacting redds and steelhead habitat). For the Proponent's Proposed Project and Alternative 1, NMFS recommends adding "long-term" and FI-9 should not include impacts to upstream migration from sluicing.

FI-63 Referring to Table 2.1, FI-12, NMFS recommends changing, "Long-term *improvement* to fish passage over the dam" to "Long-term *effects* to fish passage over the dam." All other impacts do not refer to improvement, only reduction, degradation or effects. NMFS recommends consistency.

FI-64 Referring to Table 2.1, FI-12, NMFS recommends adding "long-term" to impacts under Alternatives 1, 2 and 3. NMFS has determined that dam removal is much more beneficial for steelhead than having a fish ladder. NMFS is unclear how the impacts of dam removal and a fish ladder can be distinguished from each other when they are not equal in impacts, yet both purport to have long-term beneficial impacts.

SED-48 Referring to page 2-38, NMFS expects sluicing will have *long-term* (not short-term) significant and unavoidable effects on suspended sediments and riverine sediment storage. Sluicing may have effects for a short time during the season, but sluicing, and its effects, it will occur every year in perpetuity. Thus, NMFS expects long-term effects.

FI-65
WQ-6 Referring to page 2-39, NMFS recommends adding "long-term" while describing significant unavoidable impacts to water quality and fish.

AA-45 Referring to page 3-27, NMFS is unclear whether the new Tularcitos Road will be used for all the alternatives or only the Proponent's Proposed Project and Alternative 1. Please clarify.

AA-46
FI-66 Referring to page 3-35, NMFS is unclear whether dredging upstream of the reservoir every three years will be needed along with sluicing. Please clarify and analyze all impacts to steelhead in the reservoir if dredging is to occur.

AA-47 Referring to page 3-80, NMFS recommends lowering the height of the diversion dike to the minimum height needed for hydrologic function (*i.e.*, overtopping of 100-year storm event,

AA-47 stability). The additional excavated sediment (in excess of what is needed for the diversion dike) could be spread over the entire sand delta and/or crushed to improve compaction.

GEN-20 Referring to page 3-86, 3.6.2, NMFS notes the last paragraph starting with the second sentence of the section appears to be a repeat from page 3-85, second paragraph.

SED-49 Referring to pages 4-34, 4-87, 4-137, 4-139 and page 8 in Appendix I:
There is confusion as to the actual amount of sediment released, the duration period of a sluicing event, and the number times annually sluicing would occur. Page 4-34 states sluicing would occur for 2 to 4 hours to release 2 to 4 AF; page 4-87 states as much as 4.5 AF will be released over a 3 to 8 hour period and would occur once or twice a year; page 4-137 states 2 to 3 AF will be released over 1 to 4 hours; page 4-139 states sluicing will occur 2 to 3 times per year; and page 8 of Appendix I states 4.5 AF would be released over 8 hours. Appendix I (page 9) also states sediment would redeposit near the fish ladder depending on flow, in 5 to 20 days, requiring sluicing to begin again. The Final EIR/EIS should analyze the correct figures and be consistent throughout the document.

FI-67 Referring to page 4-83, (Issue WQ-6: Stream Diversions Return of Bypassed Flows) the mitigation for this effect is to install energy dissipators where the water is discharged back into the river. Bypass pipes must either be sized to provide for fish passage of juveniles or juveniles need to be trapped and moved around the diversion continually throughout the entire construction period. If trapping is not implemented, dissipators cannot be installed on the end of the diversion pipes since they would obstruct fish passage. See also Issue FI-4: Diversion of Carmel River and San Clemente Creek around San Clemente Reservoir for Construction Purposes, page 4-131.

FI-68 Referring to page 4-85 (Issue WQ-9: Reservoir Drawdown), the Draft EIR/EIS states, "The effects of drawdown under the Proponent's Proposed Project would likely be greater than has been observed during the 2003-2005 drawdowns because drawdown rate would be faster." The Mitigation for this Impact goes on to state, "The reservoir water level would be drawn down at a relatively slow rate (about 0.5 feet or less per day), similar to that currently being used for the annual drawdown (an interim dam safety measure). Please be consistent on the effects of the drawdown.

WQ-7 Referring to page 4-88 (Issue WQ-15: Operations/Post-Project Conditions), NMFS agrees summer water quality conditions in the reservoir would be better than during drawdowns. However, water quality conditions in the reservoir due to long-term winter sluicing operations needs to be included and analyzed. Issue WQ-13 addresses water quality below the reservoir from sluicing, but not conditions in the reservoir.

WQ-8 Referring to page 4-93, in the paragraph before Issue WQ-2: is this supposed to be Alternative *3*? Also on Pg 4-94 under Issue WQ-14, it states "…the extent of potential impacts would be greater under Alternative 2." Is this also supposed to state Alternative *3*?

AA-48 Referring to page 4-128 (Issue FI-1: Access Route Improvements):
Second paragraph under Impact states, "The Carmel River would not be dewatered to upgrade the piers and bridge deck at the ORCD." However, on Pg 4-82, under Issue WQ-4, it states, "…stream

AA-48 diversions would be required in Tularcitos Creek, in the Carmel River at the OCRD Bridge,...." Please clarify if the river will be diverted or not at the ORCD bridge for construction work.

FI-69 Referring to page 4-135 (Issue FI-8: Upstream Fish Passage): it was determined upstream fish passage would be beneficial with the improved fish ladder. However, page 5-2, 5.1.4 Aquatic Biology, states, "Adult fish may fallback over the dam during sluicing." Please address this fallback impact for the Proponent's Proposed Project and Alternative 1. NMFS expects this would be a long-term significant and unavoidable impact.

FI-70 Referring to page 4-136 (Issue FI-9: Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream): NMFS recommends changing the determination to "Significant, unavoidable, long-term".

FI-71 The Impact discussion only addresses the sluice gate operation in front of the fish ladder. There is another proposed sluice gate to keep the intake valve clear of sediment. Please discuss fish impacts from operations of the sluice gate for the intake valve. How often and for what duration will this sluice gate be operated? How much sediment will be sluiced at a time? How will fish be kept from entrainment? Determine if these impacts will be cumulative to the impacts from the fish ladder sluice gate.

FI-72 Referring to page 4-139, the last paragraph under Impact discusses degradation of habitat conditions in Reaches 4, 5, and 6. Please clarify that this would be an annual impact to this habitat each time the sluice gates release sediment and therefore 37 percent of the juvenile fish and 35 percent of the habitat downstream of San Clemente Dam would be adversely impacted each year in which sluicing occurs. These impacts will be on-going for the life of the project.

FI-73 Referring to page 4-146 (Issue FI-12: Downstream Fish Passage over SCD, Impact, the Draft EIR/EIS states, "Passing through the notch at this elevation would expose fish to higher potential to contact the spillway surface as compared to passage over the present spillway." It is unclear to NMFS if the mitigation of creating a low flow channel would prevent contact with the spillway surface or if this impact would still occur. Please clarify. If the impact will still occur, NMFS does not expect this to be a beneficial, long-term impact, but a significant, unavoidable, long-term impact.

FI-74 Referring to page 4-147 (Issue FI-13: Stream Sediment Removal, Storage, and Associated Restoration): the determination is Significant, unavoidable, long-term; however, under the Impact discussion it states this impact would only occur during construction and restoration and would be a "temporary loss of steelhead habitat." NMFS recommends changing the determination to "Temporary".

FI-75 Referring to page 4-152 (Issue FI-9: Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream): NMFS recommends changing the determination to "Significant, unavoidable, short-term; beneficial long-term".

FI-76 Referring to page 4-157 (Issue FI-9: Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream): it is NMFS' understanding from the Project

FI-77 Description that sluice gates will not be installed for the No Project Alternative. The second paragraph discusses impacts to fish from sluicing operations as the same for the Proponent's Proposed Project. Please clarify if sluice gates will be installed for the No Project Alternative or remove the discussion of sluice gates.

FI-78 Referring to page 5-23, 5.5 (Relationship Between Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity):
NMFS expects the Final EIR/EIS will include a discussion on the long-term adverse impacts to listed steelhead (by direct mortality), fish passage and habitat downstream from the long-term sluicing operations for the Proponent's Proposed Project and Alternative 1 (see comment above in the *South-Central California Coast Distinct Population Segment Steelhead* section of this letter).

AA-49 The replacement of the existing OCRD Bridge is needed only under the Proponent's Proposed Project. Under Alternative 3, this bridge and the OCRD could be removed entirely for improved passage of steelhead since the bridge will not be needed.

NEPA/ CEQA 24 Work windows are discussed throughout Section 3.0. For instance, page 3-36, 3.2.7 Construction Schedule and Operations states field work in the reservoir area would start on or about April 15th. NMFS and the California Department of Fish and Game have determined the appropriate work windows for instream work for each Alternative (email from NMFS, dated 22 February 2006). For the Proponent's Proposed Project, the work window is June 15 – October 15. Alternative 1: June 15 – October 15; Alternative 2: June 1 – October 31; and Alternative 3: June 1 – October 31. Please adjust the work windows for all projects accordingly.

In response refer to:
150308SWR2006SR00179:JEK

David A. Gutierrez
Division of Safety of Dams
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1416 Ninth Street, P.O. Box 942836
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Dear Mr. Gutierrez:

NOAA's National Marine Fisheries Service (NMFS) thanks you for the opportunity to comment on the March 2006, draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) for the San Clemente Dam Seismic Safety Project on the Carmel River, Monterey County, California. The California American Water Company (Cal-Am), under direction from the Department of Water Resources' Division of Safety of Dams (DWR) first determined the San Clemente Dam (SCD) was unsafe and posed a risk of failure in 1992. Since 1992, two species, the South-Central California Coast (S-CCC) steelhead (*Oncorhynchus mykiss*) and California red-legged frog (CRLF) (*Rana aurora draytonii*), were listed pursuant to the Federal Endangered Species Act (ESA) of 1973, as amended, and are present in the Carmel River watershed. This draft EIR/EIS is the third attempt by the DWR to find a project to eliminate the risk of dam failure while protecting Federally-listed species in the action area.

Since pre-consultation for the seismic safety project began in 1998, NMFS has expressed concerns with the impacts of sediment on steelhead. We have requested additional information about project specific sediment impacts in order to have sufficient information to initiate Endangered Species Act section 7 consultation. As early as November 8, 2000, NMFS stated impacts of sediment pulses resulting from sluice gate operations were likely a fatal flaw in the Proponent's Preferred Project. In addition to sediment-related concerns, NMFS has repeatedly expressed concerns to the SCD Seismic Safety Project Core Group about other aspects of the buttressing alternative. This latest draft EIR/EIS raises identical concerns from NMFS regarding potential adverse affects to listed steelhead.

General Comments

FI-78

NMFS has two general concerns with the draft SCD Seismic Safety Project EIR/EIS. The most significant concern is the large amount of take of listed species we believe will occur from the proposed sluice gate operations included in the Proponent's Preferred Project (buttressing) and Alternative 1 (notching), as described in the EIR/EIS. Available information indicates the take

of steelhead will be in the form of mortality, severe sublethal effects, and delayed adult migration every year. The other concern relates to differences between the *Evaluation of Sediment Sluicing Options Associated with the San Clemente Dam Fish Ladder* (Mussetter Report) from March 16, 2006, which modeled how sediment would be managed by the sluice gate and its downstream impacts, and the Sluicing Operations and Maintenance Plan (O and M Plan).

The sluice gate operations will pass 2 to 4 acre-feet (AF) of sediment, possibly exceeding 10 AF, with each sluicing during winter migratory periods. It is anticipated that for the next 12 to 20 years, (3 to 5 steelhead generations), sediment passed via sluicing will be predominantly fine grained and, subsequently, the suspended sediment concentrations below the dam would exceed lethal levels to steelhead. Sediment can be lethal to steelhead and their eggs by physiological means (gill trauma, interruption of osmoregulation, and cessation of reproduction and growth) and impacted habitat (reduced spawning habitat, reduced interstitial flow, entombing redds, and elimination of food sources). During high flow events, steelhead often seek shelter from high velocities along the bottom of the river channel, where suspended sediment concentrations are expected to exceed 20,000 mg/L during sluice events. This would exceed lethal levels as reported by Newcomb and Jensen (1996). Additionally, suspended sediment concentrations will fluctuate depending on the quantity of sediment released, but Mussetter's Report didn't provide a range of suspended sediment concentrations for sluicing of between 2 AF and 10.5 AF, which will need to be included in the final EIR/EIS. Furthermore, research in other systems (Bergstedt and Bergersen 1997) indicates that smaller quantities of sediment releases could increase suspended sediment concentrations to over 200 times their pre-sluicing levels for several days up to 29 km downstream (approximately the distance between SCD and the mouth of the Carmel River), again exceeding lethal limits. Essentially, the operation of the sluice gates will kill between 20 and 60% of migrating adults, migrating smolts, and rearing juveniles in the lower 18.5 miles of the Carmel River, several times a year, every year, until the dam is removed or the fish are extirpated. Clearly, this proposed action is not beneficial to steelhead and we strongly disagree with the "beneficial" determination in the EIR/EIS.

FI-78

The draft EIR/EIS' evaluation of impacts to downstream riverine habitats is inadequate. The EIR/EIS needs to address the sediment effects on the bed and water column. Under normal conditions sediment is transported over a six month period, generally the late fall through early spring period. Conversely, sluice gate releases, will travel in uniformly-sized sediment cluster that will move slowly downstream and overwhelm the riverine environment, depending on flow rate, flow duration, and channel morphology. The vast majority of the sediment released via the sluice gate method will be of uniform size, so the particles would not redistribute themselves to any significant degree downstream. At a minimum, these impacts need to be analyzed in terms of steelhead spawning, rearing, and migratory habitat.

FI-79

In addition to the impacts to the lower Carmel River of sluicing downstream of the dam, NMFS is concerned about the impacts of the sluicing operations in the Carmel River arm and San Clemente arm of the reservoir. Issues such as the water quality associated with the rapid drawdown of the reservoir during sluicing, adult fallback rates, the loss of redds built in sediment mobilized during sluicing, and upstream adult passage from San Clemente Reservoir through unnaturally turbid water have not been adequately analyzed in this draft of the EIR/EIS. We

FI-80

believe sufficient analysis of the upstream impacts of sluicing to steelhead and their redds would reveal they are subjected to lethal or near-lethal conditions.

FI-80

For those steelhead that manage to survive, additional impacts from sluicing will occur and the EIR/EIS is silent on these impacts as well. For example, NMFS is concerned over delays to fish passage when the fish ladder is closed for days at a time (provided migrating adult steelhead are able to reach the ladder) in order to facilitate sluicing events. Sediment pulses below the dam, which according to available information will be lethal to 20 to 60% of the steelhead population, will force the remaining migrating steelhead to seek shelter to avoid the lethal levels of suspended sediment carried downstream, which will delay or prevent migration. Additionally, we believe adult migration passage will be adversely affected upstream of the dam during sluicing operations. Adult burst speed was considered in the EIR/EIS, but the distance of impaired passage upstream of the dam was not. The EIR/EIS did not consider whether adult steelhead can swim at full burst for 0.5 miles[1] (they cannot) or if they would even try to swim against water with exceptionally high suspended sediment concentrations. The large sediment plugs released several times a year by sluicing will also create passage barriers downstream in some low gradient sections of the Carmel River.

FI-81

The Mussetter Report indicates sluicing would need to occur every 5 to 20 days in order to achieve sediment continuity, while the O and M Plan indicates sluicing will only occur once or twice a year. On average 16.5 AF of sediment is delivered to the reservoir each year. However, sediment delivery events are, on occasion, the result of significant stochastic events (*i.e.*, as a result of the Marble Cone fire in the head waters of the Carmel River an estimated total of 800-1000 AF of sediment was deposited behind San Clemente dam). The buttressing alternative (without sluice gates) model reported an average of 12.2 AF of sediment passing over the dam (when run for 41 years into the future). The remaining sediment (4.3 AF) would continue to build up behind the dam. This is likely why the O and M Plan only plans to sluice 4 AF of sediment each year. However, sluicing can potentially dump 9.5 to 10 AF in 24 hours, which equates to approximately 60% of 16.5 AF and 80% of the 12.2 AF passing over the dam if buttressed. Therefore, 6.5 AF will accumulate in the reservoir under the O and M Plan and 4.3 AF will accumulate under the buttressing alternative (without sluice gates). Consequently, NMFS believes the estimates in the O and M Plan are incorrectly based on the need to sluice 4.3 AF annually from the reservoir and as a result, they plan to release too little sediment to maintain fish passage to the upper river. Over time, the proposed sluicing will be inadequate to handle incoming sediment loads and there are no contingency plans for stochastic sediment delivery events.

SED-51

NMFS is concerned that the O and M Plan lacks a comprehensive analysis and provides no assurances for abnormal conditions or even conditions 5 years from now. There are no contingency plans for drought or above average rainfall events or for episodic sediment delivery (*i.e.*, wildfire and resulting sediment delivery which is a fairly predictable occurrence in the chaparral vegetation community in California). All reasonably expected conditions (wet years, dry years) needed to be realistically evaluated in terms of the totality of their potential impacts. The EIR/EIS needs to analyze the effects that will occur between the uppermost point of the reservoir incision channel to the ocean. There is also uncertainty about who will make the

SED-52

[1] the upstream distance affected by sluicing

SED-52 decision to sluice, which needs to be clearly vetted. NMFS also expects mechanical problems with the sluice gates at some point in the next 100 years to create conditions that cause the fish ladder to be disconnected from the reservoir thus a contingency plan will need to be developed for this circumstance.

There are many instances throughout the draft EIR/EIS where the alternatives are compared to the baseline conditions rather than the No Action Alternative (Alternative 4). In a NEPA document, the analysis must compare the effects of an action versus the No Action Alternative. The effects determinations are inconsistent or incorrect, which creates the impression that the Proponent's Preferred Project is beneficial.

Specific Comments

Mussetter's Report

Section 4 summary, page 8, item 3, alludes to differences in time for wet and dry years, which we know to be substantial. NMFS recommends further analysis to address risks during non-normal flow years.

Section 4 summary, page 8, item 4: What is the depth of accumulation in the channel downstream of SCD and what is the channel geometry like and flow depths?

Section 4 summary, page 8, item 5: What physical processes occur in the stilling pool? This needs additional analysis.

Figure 22, needs an explanation of steep water surface curves in the vicinity of the dam to about 800 feet upstream, and implications for fish passage in addition to the velocity figures given.

Figure 26: What causes the spikes in velocity? Are they real or model artifacts and how will they impact steelhead migration?

Sluicing Operations and Management Plan

SED-53 Page 3, second paragraph, is where 'one or two sluicing events per year for several hours' is proposed, and demonstrates a significant inconsistency between the O and M Plan and the Mussetter Report.

FI-82 Page 4, first paragraph of Fish Behavior and Movement section: The operations protocol for cutoff of flows to the ladder is set at 20 or more fish passing the ladder during the previous 2 days to protect steelhead. This cutoff protocol is completely inadequate because the number of steelhead used equates to over 6 percent of the recorded adult population passing SCD in recent years.

FI-83 Page 4, last paragraph: NMFS does not believe that the plan to induce upstream migration from a resting area would work. Instead, the steelhead may just move to a different location a few feet away.

FI-84 Page 7, second paragraph: There will be a mortality and the survivors will have their migration delayed due to steelhead response to the sediment plume as it passes the length of the river from the dam to the ocean. This avoidance behavior to extreme sediment loads is well documented.

SED-54 Page 7, last paragraph: NMFS is extremely concerned by the language used in this section. To indicate that "(i)t is not possible to predict the suspended sediment load or turbidity levels from the modeling data" is unwarranted because the figures provided in the Mussetter Report were based on these data. Statements such as this call into question the analyses used, and interpretations of results, here and elsewhere in the EIR/EIS.

SED-55 Sediment and Turbidity section: This section needs to include an analysis of sediment pulse routing downstream and an analysis of such pulses on fish and habitat. Without these analyses, NMFS has little confidence in any interpretations provided in the EIR/EIS. For example, the additive effects of sediment pulses were not considered. Pulses of sediment can accumulate in low gradient sections of stream and create adverse cumulative effects beyond the individual releases.

GEN-17 Figure 5: This caption appears to be for another, unrelated figure.

GEN-18 Also, the O and M Plan fails to address such concerns as changes in dam ownership, staffing, long-term funding, and budget crises. NMFS cannot approve such an intensive and risk prone plan, without considerable changes to the O and M Plan, and then it must be third party implemented, funded up-front, and bonded for at least 100 years to ensure that the steelhead resource will not be lost due to reasonably foreseeable events.

EIR/EIS Section 4.4

FI-85 In table 4.4-2, you cannot express fish counted as a percentage of the total run of fish if the total number of fish in the run is unknown. Available information indicates that during some years, fish pass the counter on the ladder on the last day the counter is operated, strongly suggesting the adult migration was not complete. Obviously, "most" of the run has passed in this time period, but using percentages is inaccurate. There are some years that the river flows to the ocean year round and adults can move upstream at any time, and early and late migrations are known for the few years the counter was in use early or late in the year.

FI-86 Table 4.4-5: Again, percentages cannot be used in this case because only 60% of the habitats are considered. We know the lagoon provides rearing habitat and there are some areas of good quality habitat in reach 3 as well. The percentages given in the table are inflated by not including the other 4 reaches that were not analyzed.

FI-87 Sleepy Hollow Steelhead Rearing Facility section: The entire section can be eliminated as it adds nothing to the discussion of the SCD EIR/EIS. The rearing facility was established to raise fish that are displaced when the river downstream dries up every year.

FI-88 Table 4.4-6: Under PP, Reach 4 – 8,532 and 8,522 – are these supposed to be the same? Please explain the difference in numbers for reach 6a between alternatives. Under reach 5, Alt 1, why do the operations have half the effects of CY2 and 3? We recommend describing the difference between CY and operations below the chart.

FI-89 FI-1, Access Route Improvements: NMFS disagrees with the effects determination of "temporary" for this aspect of the project. The EIR/EIS indicates the roads will be permanent, some becoming the primary access routes after the project. Riparian roads are a leading cause of water quality degradation, contributing fine sediments and leading to increased cobble embeddedness. The bridge over Tularcitos is a major impact associated with this project, which is not reflected in the effects determination.

FI-90 FI-3, Operation of a Trap and Truck Facility: This has been avoided by the June 15-Oct 15 instream work window for PP and Alt 1 – no trap and truck measures will be needed. For Alt 2 and Alt 3, NMFS is still willing to eliminate the trap and truck expense to get the dam removed.

FI-91 FI-6, Water Quality Effects on Fish: Include language on fuel storage, spills, BMPs, etc. Also, for some reason, impacts to water quality resulting from the sluice gate have not been analyzed. NMFS expects the impacts to steelhead from sluice gate operations will be lethal the entire 18.5 miles below the dam.

FI-92 FI-7, Fish Ladder Closure: Long-term ladder issues, specifically those causing closure , need to be addressed – sediment inundation, sluicing operations, etc – in the EIR/EIS as well as in the O and M Plan with acceptable passage plans when the ladder is impassable.

FI-93 FI-8, Upstream Fish Passage: See General Comments on sluice gate operation and then address the inappropriate effects determination. As for passage between the reservoir and upstream habitat during sluicing, would 300-700 cfs, 1-foot deep, and the width of the channel for 0.05 miles be a passage barrier? The river was considered passable by citing steelhead burst speeds in feet per second (fps) and flow rates of about 6 fps 50 feet upstream of the dam. At this time however, 2-4 acre feet of sediment will be flowing down the Carmel at 6 fps. Steelhead don't usually swim into areas of high suspended sediment, but rather try to find cover, hold along the channel bottom, and delay their migration until there is less suspended sediment in the water. It is more likely that they swim downstream away from the sediment laden water rather than upstream through it.

FI-94 FI-9, Downstream Sediment Impacts: See General Comments and then address the inappropriate effects determination. The sluiced sediment will not be "mobilized and redistributed" but will more likely be uniformly-sized material and will move through the river in what is described as a "plug flow." It will be mobilized, but it will move downstream, smothering each area that it moves into until it reaches the ocean. In low gradient channels, this process can take decades even if flows are above normal every year. The impacts will easily range from the dam to the ocean and will exceed lethal limits the entire way downstream. In regards to the number of fish impacted, only the numbers of rearing fish are considered, but migrating adults, migrating smolts, and rearing juveniles will be subjected to lethal levels of suspended sediments in the lower river. Essentially 100% of the anadromous fish in the Carmel River will be affected by

FI-94 this project if it is carried out as described in the Mussetter Report, which notes the need to sluice every 5 to 20 days during the migratory season.

FI-95 FI-13, Stream Sediment Removal: Must remove sediment to access the lower gate in the dam face. Where will the sediment be disposed of, how will you remove it, risk of fuel spills/lubrication leaks, fine sediment against dam, *et cetera*.

FI-96 FI-14, Notching Old Carmel River Dam: NMFS understood the original plan to notch the Old Carmel River Dam would require dewatering the area around the dam. Mortality of steelhead in dewatered areas is likely to occur and would be a significant impact under NEPA. The effects determination here is incorrect.

GEN-19 Alternative 1: NMFS has many similar concerns between the Proponent's Preferred Project and this alternative. For instance, in FI-8: NMFS believes sluicing will not be beneficial to listed steelhead.

FI-97 Alternative 2, FI-9, Downstream Sediment Transport: This will be beneficial as natural sediment loads would be transported during natural sediment transport flows. Natural sediment transport would be allowed to occur during all flows during all times of the year, differentiating this alternative and Alternative 3 from the previous two alternatives that would not provide natural sediment transport, but rather pulses of sediment at levels that would be considered catastrophic if they occurred naturally.

FI-98
SED-56 In Alternative 4, sluicing seems to be part of this alternative, but it is not addressed in the same fashion as the Proponent's Preferred Project or Alternative 1. It should be addressed in the same fashion and the effects determination should be the same for both. There are several instances where the effects between the No Action Alternative and the Proponent's Preferred Project are the same in their description, but different under the effects determination.

Conclusion

AL-11 In light of the impacts described above, NMFS believes the use of sluice gates constitutes the fatal flaw in the Proponent's Preferred Project (buttressing) and Alternative 1 (notching). Based on the information NMFS has reviewed, NMFS believes the sluice gates will likely lead to the extirpation of an anadromous steelhead run in the Carmel River, which is the largest remaining run of anadromous steelhead in the S-CCC distinct population segment. NMFS, as stated many times over the past 6 years, recommends no further consideration of alternatives that include sluicing. We strongly encourage the DWR to fully consider our recommendations and move forward to address the seismic safety of the San Clemente Dam.

Thank you for your continued coordination and cooperation on this project. If you have questions regarding this letter please contact Mr. Jason Kahn at 707-575-6096 or Ms. Joyce Ambrosius at 707-575-6064.

Sincerely,

Dick Butler
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Enclosure

National Marine Fisheries Service's (NMFS) Comments on the April 2006 Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) for the San Clemente Dam Seismic Safety Project on the Carmel River, Monterey County, California

June 30, 2006

South-Central California Coast Distinct Population Segment Steelhead

FI-45 The Draft EIR/EIS recognizes the protected status of the Carmel River steelhead population, but does not fully reflect the importance of the population to the South-Central California Coast (S-CCC) Distinct Population Segment (DPS). Restoring the Carmel River steelhead run is expected to play an essential role in the recovery of the S-CCC DPS, and its eventual delisting, but the Draft EIR/EIS does not acknowledge this.

FI-46 The Draft EIR/EIS provides only the most recent run-counts in the Carmel River and does not provide any historic context in which to assess the size of these most recent runs, either within the Carmel River itself or in the S-CCC DPS, of which the Carmel River is a part. The original[1] and most recently up-dated[2] NMFS's Status Review for Environmentally Significant Units of West Coast Salmon and Steelhead have reported that the historic run size of the Carmel River in 1928 was estimated by the California Department of Fish and Game at 20,000 adults per year, which is the largest steelhead run in the S-CCC DPS. The current run-size for the entire S-CCC DPS is estimated to be approximately 500 adults per year, which represents a decline of over 90 percent of the historic run-size. The percentage decline of the Carmel River steelhead run is likely greater. Analysis in the Draft EIR/EIS fails to demonstrate that the Proponent's Proposed Project and Alternative 1 will not further the decline of the Carmel River steelhead run.

FI-47 As part of the recovery planning for the S-CCC DPS, the Carmel River has been consistently ranked by NMFS as the most potentially viable steelhead watershed. NMFS has determined the already severely depressed Carmel River steelhead run cannot be allowed to decline further if recovery of the S-CCC DPS is to be achieved. Section 7(a)(1) of the Federal Endangered Species Act (ESA) makes it clear that all Federal agencies should participate in the conservation and recovery of listed threatened and endangered species.

The Carmel River has been designated as critical habitat for S-CCC DPS steelhead. The Carmel River downstream of San Clemente Dam supports a significant portion of the juvenile steelhead

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[1] Busby, P.J., T.C. Wainwright, G.J. Bryant, L.J. Lierheimer, R.S. Waples, F.W. Waknitz, and I.V. Lagomarsino. 1996. Status of West Coast steelhead from Washington, Idaho, Oregon, and California. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-27.

[2] Good, T.P., R.S. Waples, and P. Adams, editors. 2005. Updated status of Federally listed ESUs of West Coast salmon and steelhead. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-66.

rearing in the lower Carmel River. The Draft EIR/EIS identifies significant adverse impacts to steelhead spawning and rearing habitat below San Clemente Dam associated with the sluicing of the reservoir to maintain effective operation of the reconstructed fish passage facilities. These include the repeated discharge of concentrated levels of finer sediments which would adversely affect steelhead habitat downstream.

The mitigation identified for this significant adverse impact consists of "minimizing impacts on steelhead" and a further evaluation "to determine effects on downstream channels, habitat and fishes". This proposed mitigation is flawed in two fundamental respects. First, the proposal to further evaluate adverse effects of the proposed sediment sluicing operation on the downstream channel, habitat and fishes is not itself mitigation, and such proposals have been consistently rejected in judicial review under the California Environmental Quality Act (CEQA). Second, there is nothing in the protocols for the sluicing operations and management plan which clearly indicates to what level the impacts associated with this aspect of the proposed project would be reduced.

FI-47a

FI-47b

FI-47b

Given the existing severely depressed populations of steelhead in the Carmel River, and the role of the Carmel River in the recovery of the S-CCC DPS, the vague mitigation measure proposed is not adequate to make a determination of "no significant impact". Further, a finding supporting a statement of over-riding considerations must address both the threatened status of the S-CCC DPS and the expected role the Carmel River will have in the recovery and delisting of the DPS.

FI-47c

FI-47d

One of CEQA's main objectives is to require agencies to avoid or reduce the environmental effects by implementing feasible alternatives or mitigation measures. One of the purposes of the ESA is to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved. The Carmel River steelhead run is critical to the recovery of the S-CCC DPS. A proposed project alternative that results in the perpetual adverse modification of designated critical habitat, as well as perpetual take of listed species is inconsistent with CEQA, as well as the ESA and the recovery needs of the S-CCC DPS.

NEPA/ CEQA-22

FI-47e The Final EIR/EIS should: (1) address the fact that the severely depressed steelhead run in the Carmel River is one of the principal reasons the S-CCC DPS has been listed by NMFS as

FI-47f threatened under the ESA; (2) include a discussion on the long-term adverse impacts to listed steelhead (by direct mortality), fish passage and habitat downstream from the long-term sluicing

FI-47g operations as part of the Proponent's Proposed Project and Alternative 1; (3) address how the Proponent's Proposed Project and all of the alternatives will affect the restoration of the Carmel

FI-47h River steelhead run; and (4) provide analyses that demonstrate the Proponent's Proposed Project and Alternative 1 will not further the decline of the Carmel River steelhead run.

Effects of sediment discharged downstream of the San Clemente Dam from slucing operations

The analysis of the sluicing operations' impacts downstream of the dam focuses on the physical behavior of the sediments. However, the analysis does not specifically address the impacts on fisheries or other aquatic resources. This lack of analysis is significant because it is principally the effects of discharged sediments (particularly fine sediments) in an artificial manner (timing, amount, duration and composition) on aquatic resources that is the focus of the CEQA analysis. In

FI-48

FI-48 addition to steelhead, potentially impacted aquatic resources include benthic invertebrates and rooted aquatic vegetation.

FI-49 The characterization of the sediment sluicing operations as causing only a "short-term increase in the sediment load to the downstream river" is misleading. While the immediate principal impacts of the sediment sluicing may be concentrated in a relatively short period each year, the sluicing operations are proposed in perpetuity and will be necessary in perpetuity, or at least for as long as the San Clemente Dam is in place. Consequently, the real impacts can only be evaluated on a cumulative basis. At a minimum, adult steelhead migrating upstream, benthic invertebrates, incubation of steelhead alevins, rearing/feeding of juvenile steelhead and steelhead spawning in the lower reaches of the Carmel River downstream of the San Clemente Dam will be adversely impacted in perpetuity by the sluicing operations.

FI-50 The Proponent's proposed standard regarding the timing of sediment sluicing (*i.e.*, ceasing sediment sluicing if 20 or more steelhead have passed the ladder in the previous two days) is arbitrary. Since it is arbitrary, the proposed standard could conflict with the basic objective of sediment sluicing: control sediment build-up in the river channel in the reservoir immediately above the San Clemente Dam to facilitate adequate steelhead passage opportunities through the fish ladder. It bears mention that in some years the number of steelhead proposed as the "cease sluicing standard" has constituted a significant portion of the total Carmel River steelhead run in a single month.

FI-51 As noted in the Sluicing Operations and Maintenance Plan, high turbidity and suspended sediment are potentially the most significant hazards to adult steelhead migrating up the Carmel River. Swimming performance of adult (and juvenile) salmon can be impaired by poor water quality. Migrating salmonids avoid waters with high silt loads, or cease migration when such loads are unavoidable. A large portion of the Carmel River adult steelhead population would be exposed to these effects based on the estimate that about one half (55 percent) of the adults that enter the Carmel River may move upstream of the San Clemente Dam.

FI-52 When water quality conditions are impassable to fish, their upstream movement is delayed for as long as that condition persists. Delayed fish may expend the stored energy necessary for successful migration, maturation and spawning before reaching their destination, resulting in weakened fish more disposed to disease or pre-spawning mortality. Delayed adult upstream migration is another stressor added to a population that has already declined significantly.

FI-53 The Draft EIR/EIS notes that suspended sediment levels as a result of sluicing would impair the ability of steelhead to see and feed, would impair homing, delay migration and cause physiological responses ranging from stress to death depending on the level of suspended sediment and duration of exposure. Larval steelhead and eggs would also be affected. These effects to all steelhead life stages will occur in perpetuity and the Draft EIR/EIS fails to analyze these effects to the Carmel River steelhead population in perpetuity. For instance, adults, juveniles, eggs and larval steelhead may experience severe habitat modification and up to 40 percent mortality. The proposed mitigation (*e.g.*, the Sluicing Operations and Maintenance Plan and an evaluation to determine downstream effects) is insufficient to mitigate the high levels of mortality and severe habitat degradation that will occur in perpetuity.

FI-54

The Sluicing Operations and Maintenance Plan notes steelhead throughout their range frequently encounter migratory obstructions (*e.g.*, beaver dams, cascades, logjams) which delay migration, but that such delays usually don't affect the ultimate reproductive capacity of the fish. NMFS agrees that relatively small natural barriers are well adapted to by steelhead. However, the scale of the proposed sluicing operations and the resultant effects downstream – high turbidity and suspended sediment – are profoundly unnatural in the Carmel River.

Beaver dams and logjams are likely temporal obstructions. The sluicing operations are proposed in perpetuity and will be necessary in perpetuity, or at least for as long as the San Clemente Dam is in place. Therefore, delays to adult migration will occur for as long as sluicing operations are conducted.

SED-42

NMFS participated in the detailed sediment transport analysis conducted after the August 2000 Draft EIR/EIS was submitted. That Draft EIR/EIS also proposed dam strengthening and sluice gates. NMFS' significant commitment during those sediment transport studies was primarily to ensure dam removal was given adequate examination. NMFS was also establishing a systematic methodology for future analysis regarding the San Clemente Dam. NMFS expects that level of analysis for the proposed sluicing operations, but the Draft EIR/EIS does not include those results.

NEPA/ CEQA-23

The results of a defendable systematic analysis would include suspended sediment concentrations from the dam to the ocean for a full range of hydrologic conditions. Suspended sediment in the water column, as well as habitat alteration, would be addressed. The Draft EIR/EIS has taken an unacceptable short cut in analyzing a project that proposes to adversely effect – in perpetuity – the most essential steelhead run in the S-CCC DPS.

Sluicing Operations and Maintenance Plan

SED-43a

The Proponent's Proposed Project and Alternative 1 will require the San Clemente Dam to continue to store sediment. Stored sediment in the reservoir will continue to be a steelhead passage impediment above the ladder. The flaws within the Sluicing Operations and Maintenance Plan are that actual sediment sluicing operations are likely to vary considerably, depending on the sediment delivery events to the reservoir and sediment deposition patterns in the reservoir. With the continued filling of the reservoir with sediment, NMFS expects there will be a braided channel near the upper end of the reservoir that will further impair steelhead passage.

SED-43b

SED-44

The Draft EIR/EIS states sluicing is expected to occur two-to-three times per year based on the number of flow events that occur over the winter and the length of the (steelhead) migration season, while the Sluicing Operations and Maintenance Plan states sluicing would occur over several hours once or twice a year, yet Appendix I states that aggradation would prograde near the fish ladder inlet in 5-20 days, depending on stream flow. NMFS infers from Appendix I that sluicing may be required more frequently than one-to-three times per year. Therefore, based on the information in Appendix I, it is unclear how sluicing as described in the Draft EIR/EIS and the Sluicing Operations and Maintenance Plan meets the basic objective of sediment sluicing: control sediment build-up in the river channel in the reservoir immediately above the San Clemente Dam to facilitate adequate steelhead passage opportunities through the fish ladder.

FI-55 The Draft EIR/EIS notes that the first storms of the season and the first opening of the Carmel River lagoon sandbar control the initial adult steelhead upstream migration.

FI-56 The Draft EIR/EIS states that, "(i)deally, the first sluice event for a given year would occur prior to the initial (adult upstream) steelhead migration, depending on the timing of storms." It is unknown in how many years the first sluice event will occur prior to the initial steelhead migration. NMFS is concerned that adult steelhead migrating upstream will be affected by the first (and all) sluicing events as there is no certainty in predicting when sluicing events will occur and no assurance that initial adult upstream migrants will not be present during the first sluicing period in any given year.

SED-45 The Mediterranean climate of the Carmel River Valley is prone to seasonal, prolonged and severe droughts. Wildfire and flooding are also part of the Carmel River watershed processes. The Carmel River watershed generates and stores sediment during normal or low-flow years and the river depends upon high flows for extremely high transport rates during wet years. Therefore, the Draft EIR/EIS use of average hydrologic conditions when analyzing the downstream effects of sediment sluicing and for the design of the Sluicing Operations and Maintenance Plan is inappropriate. NMFS is concerned how the Sluicing Operations and Maintenance Plan will be implemented in dry and wet years.

SED-46 Although the Sluicing Operations and Maintenance Plan includes a Proposed Sluicing Decision Tree, the decision-making processes of how often to sluice and the determination of whether a sluicing event was successful have not been adequately described. For instance, the criteria of whether flows that are increasing are likely to exceed 300 cubic feet per second (cfs) have not been described. The criteria for determining whether "storm precipitation predicted to be significant" have not been described. Also lacking are the real-time methodologies and criteria for measuring and monitoring the incision goal.

SED-47 NMFS has determined the Proposed Sluicing Decision Tree in the Sluicing Operations and Maintenance Plan is too simplistic and does not account for all the unforeseen and unpredictable events that can occur each year. Each step in the Decision Tree asks questions that are difficult, if not impossible, to answer accurately. Questions raised for each step follow:

SED-47a *Is sediment delta passage a problem?* How will passage problems be determined? When will it be determined when sluicing is to occur? Making a determination before the winter migration period may be inaccurate due to changing conditions behind the reservoir once high flows begin. Please clarify how channel depth and width within the reservoir will be measured during the high flow season in order to initiate sluicing. Since steelhead tend to migrate on the descending limb of a storm, how feasible and safe is it to place crews out on the reservoir to measure channel dimensions during storm events?

SED-47b FI-57a

SED-47b If sediment delta passage is a problem, but increasing flows are predicted not to exceed 300 cfs, sluicing will not occur. However, passage has already been determined to be impacted. How will fish pass through the blocked sediment delta during their migration before a sluice event has been performed? These delays need to be addressed.

FI-57b

SED-47c
FI-57c

Is it peak migration season?
Peak migration season is generally between February and March, however, it depends on the hydrologic cycle as to when the majority of fish migrate.

SED-47d
FI-57d

Will a passage problem potentially develop during the next storm event?
How will this be determined? It is unknown how large or small the next storm event will be and how much sediment will be carried into the reservoir.

SED-47e
FI-57e

It has already been determined that passage is a problem in the first step. But if a significant storm event is not predicted, sluicing will not occur and blocked passage will continue to delay migration.

SED-47f
FI-57f

Have 20 or more fish ascended the ladder in the past 2 days?
Per our April 5, 2006, letter, NMFS believes the decision whether 20 or more fish have ascended the ladder is an arbitrary number. Please clarify how this number was determined to be a defining point to sluice or not.

SED-47g
FI-57g

If this number of fish has ascended the ladder, sluicing will not occur even though a passage problem potentially will occur during the next storm event. This is a large number of steelhead to be trapped in the sediment delta without being able to move upstream. The impact of delay to these fish needs to be addressed.

SED-47h
FI-57h

Increasing flows likely to exceed 300 cfs?
Future hydrologic conditions are very difficult to predict. Basing management decisions (when sluicing is to occur) on unpredictable occurrences is unacceptable.

SED-47i
FI-57i

Storm precipitation predicted to be significant?
See comment above. Although predicting storm events is becoming easier, storm intensity is unknown until the storm is actually occurring.

SED-47j
FI-57j

Is flow still increasing past 300 cfs?
How long does it need to keep increasing past 300 cfs? This is unpredictable.

SED-47k
FI-57k

Continue sluicing until time limit, incision goal, or flow limit is reached.
What is the time limit for sluicing? Please clarify how channel depth and width within the reservoir will be measured during the high flow season in order to determine that enough sediment has been sluiced to provide for passage. What is the flow limit?

SED-47l
FI-57l

If flow is not increasing past 300 cfs, abort, re-open fish ladder.
How many aborted sluicing events will occur causing unnecessary delay to fish migration throughout the season due to the inability to predict hydrologic events to induce sluicing?

General Comments

FI-58

Referring to Table 2.1, FI-4, NMFS recommends adding "short-term" to impacts under Alternatives 2 and 3.

FI-59 Referring to Table 2.1, FI-7, NMFS recommends adding "long-term, significant, unavoidable" to impacts under the Proponent's Proposed Project.

FI-60 Referring to Table 2.1, FI-7, NMFS recommends adding "short-term" to impacts under Alternatives 1, 2 and 3.

FI-61 Referring to Table 2.1, FI-8, NMFS recommends FI-8 should include sluicing impacts on upstream fish migration. For the Proponent's Proposed Project and Alternative 1, it would be long-term unavoidable significant impacts, as well as beneficial with new fish ladder. NMFS suggests F1-8 may need to be separated into two separate impacts: sluicing impacts on upstream fish migration and beneficial effects of a new fish ladder.

FI-62 Referring to Table 2.1, FI-9, NMFS recommends FI-9 should include only sediment impacts to channels downstream (*i.e.*, impacting redds and steelhead habitat). For the Proponent's Proposed Project and Alternative 1, NMFS recommends adding "long-term" and FI-9 should not include impacts to upstream migration from sluicing.

FI-63 Referring to Table 2.1, FI-12, NMFS recommends changing, "Long-term *improvement* to fish passage over the dam" to "Long-term *effects* to fish passage over the dam." All other impacts do not refer to improvement, only reduction, degradation or effects. NMFS recommends consistency.

FI-64 Referring to Table 2.1, FI-12, NMFS recommends adding "long-term" to impacts under Alternatives 1, 2 and 3. NMFS has determined that dam removal is much more beneficial for steelhead than having a fish ladder. NMFS is unclear how the impacts of dam removal and a fish ladder can be distinguished from each other when they are not equal in impacts, yet both purport to have long-term beneficial impacts.

SED-48 Referring to page 2-38, NMFS expects sluicing will have *long-term* (not short-term) significant and unavoidable effects on suspended sediments and riverine sediment storage. Sluicing may have effects for a short time during the season, but sluicing, and its effects, it will occur every year in perpetuity. Thus, NMFS expects long-term effects.

FI-65
WQ-6 Referring to page 2-39, NMFS recommends adding "long-term" while describing significant unavoidable impacts to water quality and fish.

AA-45 Referring to page 3-27, NMFS is unclear whether the new Tularcitos Road will be used for all the alternatives or only the Proponent's Proposed Project and Alternative 1. Please clarify.

AA-46
FI-66 Referring to page 3-35, NMFS is unclear whether dredging upstream of the reservoir every three years will be needed along with sluicing. Please clarify and analyze all impacts to steelhead in the reservoir if dredging is to occur.

AA-47 Referring to page 3-80, NMFS recommends lowering the height of the diversion dike to the minimum height needed for hydrologic function (*i.e.*, overtopping of 100-year storm event,

AA-47 stability). The additional excavated sediment (in excess of what is needed for the diversion dike) could be spread over the entire sand delta and/or crushed to improve compaction.

GEN-20 Referring to page 3-86, 3.6.2, NMFS notes the last paragraph starting with the second sentence of the section appears to be a repeat from page 3-85, second paragraph.

SED-49 Referring to pages 4-34, 4-87, 4-137, 4-139 and page 8 in Appendix I:
There is confusion as to the actual amount of sediment released, the duration period of a sluicing event, and the number times annually sluicing would occur. Page 4-34 states sluicing would occur for 2 to 4 hours to release 2 to 4 AF; page 4-87 states as much as 4.5 AF will be released over a 3 to 8 hour period and would occur once or twice a year; page 4-137 states 2 to 3 AF will be released over 1 to 4 hours; page 4-139 states sluicing will occur 2 to 3 times per year; and page 8 of Appendix I states 4.5 AF would be released over 8 hours. Appendix I (page 9) also states sediment would redeposit near the fish ladder depending on flow, in 5 to 20 days, requiring sluicing to begin again. The Final EIR/EIS should analyze the correct figures and be consistent throughout the document.

FI-67 Referring to page 4-83, (Issue WQ-6: Stream Diversions Return of Bypassed Flows) the mitigation for this effect is to install energy dissipators where the water is discharged back into the river. Bypass pipes must either be sized to provide for fish passage of juveniles or juveniles need to be trapped and moved around the diversion continually throughout the entire construction period. If trapping is not implemented, dissipators cannot be installed on the end of the diversion pipes since they would obstruct fish passage. See also Issue FI-4: Diversion of Carmel River and San Clemente Creek around San Clemente Reservoir for Construction Purposes, page 4-131.

FI-68 Referring to page 4-85 (Issue WQ-9: Reservoir Drawdown), the Draft EIR/EIS states, "The effects of drawdown under the Proponent's Proposed Project would likely be greater than has been observed during the 2003-2005 drawdowns because drawdown rate would be faster." The Mitigation for this Impact goes on to state, "The reservoir water level would be drawn down at a relatively slow rate (about 0.5 feet or less per day), similar to that currently being used for the annual drawdown (an interim dam safety measure). Please be consistent on the effects of the drawdown.

WQ-7 Referring to page 4-88 (Issue WQ-15: Operations/Post-Project Conditions), NMFS agrees summer water quality conditions in the reservoir would be better than during drawdowns. However, water quality conditions in the reservoir due to long-term winter sluicing operations needs to be included and analyzed. Issue WQ-13 addresses water quality below the reservoir from sluicing, but not conditions in the reservoir.

WQ-8 Referring to page 4-93, in the paragraph before Issue WQ-2: is this supposed to be Alternative *3*? Also on Pg 4-94 under Issue WQ-14, it states "...the extent of potential impacts would be greater under Alternative 2." Is this also supposed to state Alternative *3*?

AA-48 Referring to page 4-128 (Issue FI-1: Access Route Improvements):
Second paragraph under Impact states, "The Carmel River would not be dewatered to upgrade the piers and bridge deck at the ORCD." However, on Pg 4-82, under Issue WQ-4, it states, "...stream

AA-48 diversions would be required in Tularcitos Creek, in the Carmel River at the OCRD Bridge,…." Please clarify if the river will be diverted or not at the ORCD bridge for construction work.

FI-69 Referring to page 4-135 (Issue FI-8: Upstream Fish Passage): it was determined upstream fish passage would be beneficial with the improved fish ladder. However, page 5-2, 5.1.4 Aquatic Biology, states, "Adult fish may fallback over the dam during sluicing." Please address this fallback impact for the Proponent's Proposed Project and Alternative 1. NMFS expects this would be a long-term significant and unavoidable impact.

FI-70 Referring to page 4-136 (Issue FI-9: Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream): NMFS recommends changing the determination to "Significant, unavoidable, long-term".

FI-71 The Impact discussion only addresses the sluice gate operation in front of the fish ladder. There is another proposed sluice gate to keep the intake valve clear of sediment. Please discuss fish impacts from operations of the sluice gate for the intake valve. How often and for what duration will this sluice gate be operated? How much sediment will be sluiced at a time? How will fish be kept from entrainment? Determine if these impacts will be cumulative to the impacts from the fish ladder sluice gate.

FI-72 Referring to page 4-139, the last paragraph under Impact discusses degradation of habitat conditions in Reaches 4, 5, and 6. Please clarify that this would be an annual impact to this habitat each time the sluice gates release sediment and therefore 37 percent of the juvenile fish and 35 percent of the habitat downstream of San Clemente Dam would be adversely impacted each year in which sluicing occurs. These impacts will be on-going for the life of the project.

FI-73 Referring to page 4-146 (Issue FI-12: Downstream Fish Passage over SCD, Impact, the Draft EIR/EIS states, "Passing through the notch at this elevation would expose fish to higher potential to contact the spillway surface as compared to passage over the present spillway." It is unclear to NMFS if the mitigation of creating a low flow channel would prevent contact with the spillway surface or if this impact would still occur. Please clarify. If the impact will still occur, NMFS does not expect this to be a beneficial, long-term impact, but a significant, unavoidable, long-term impact.

FI-74 Referring to page 4-147 (Issue FI-13: Stream Sediment Removal, Storage, and Associated Restoration): the determination is Significant, unavoidable, long-term; however, under the Impact discussion it states this impact would only occur during construction and restoration and would be a "temporary loss of steelhead habitat." NMFS recommends changing the determination to "Temporary".

FI-75 Referring to page 4-152 (Issue FI-9: Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream): NMFS recommends changing the determination to "Significant, unavoidable, short-term; beneficial long-term".

FI-76 Referring to page 4-157 (Issue FI-9: Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream): it is NMFS' understanding from the Project

FI-76 Description that sluice gates will not be installed for the No Project Alternative. The second paragraph discusses impacts to fish from sluicing operations as the same for the Proponent's Proposed Project. Please clarify if sluice gates will be installed for the No Project Alternative or remove the discussion of sluice gates.

FI-77 Referring to page 5-23, 5.5 (Relationship Between Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity):
NMFS expects the Final EIR/EIS will include a discussion on the long-term adverse impacts to listed steelhead (by direct mortality), fish passage and habitat downstream from the long-term sluicing operations for the Proponent's Proposed Project and Alternative 1 (see comment above in the *South-Central California Coast Distinct Population Segment Steelhead* section of this letter).

AA-49 The replacement of the existing OCRD Bridge is needed only under the Proponent's Proposed Project. Under Alternative 3, this bridge and the OCRD could be removed entirely for improved passage of steelhead since the bridge will not be needed.

NEPA/ CEQA 24 Work windows are discussed throughout Section 3.0. For instance, page 3-36, 3.2.7 Construction Schedule and Operations states field work in the reservoir area would start on or about April 15th. NMFS and the California Department of Fish and Game have determined the appropriate work windows for instream work for each Alternative (email from NMFS, dated 22 February 2006). For the Proponent's Proposed Project, the work window is June 15 – October 15. Alternative 1: June 15 – October 15; Alternative 2: June 1 – October 31; and Alternative 3: June 1 – October 31. Please adjust the work windows for all projects accordingly.

Northern California Council of the Federation of Fly Fishers
116 Allegro Drive, Santa Cruz CA 95060

June 1, 2006

Charyce Hatler
Department of Water Resources,
San Joaquin District
3374 East Shields Avenue
Fresno, CA 93726-6913

Re: San Clemente Dam Seismic Retrofit Project, Draft EIS

Dear Ms. Hatler,

Thank you for the opportunity to comment on the Draft Environmental Impact Statement for the San Clemente Dam Seismic Retrofit Project on the Carmel River. Enclosed for the record and your consideration are the comments from the Northern California Council of the Federation of Fly Fishers (NCCFFF), supporting ALTERNATIVE 3: CARMEL RIVER REROUTE AND DAM REMOVAL.

AL-2 NCCFFF represents a diverse group of California citizens who not only share a love of fly fishing, but are also dedicated to the preservation and enhancement of the state's fish populations. Our organization is active in many conservation efforts to preserve, protect and restore habitat essential to fish. This project presents a unique opportunity to help restore the largest steelhead population south of Monterey Bay, and as such we feel compelled to comment.

In support of ALTERNATIVE 3:

- It would permanently eliminate safety concerns through the removal of the dam.
- It would permanently eliminate the fish passage barrier.
- It would permanently minimize temperature increases during passage through the reservoir site.
- AL-3 It would require a minimum of sediment removal, and not require long distance transport of the sediment. Under this alternative, sediment need only be transported a short distance from the San Clemente arm to the Carmel River arm.
- Sluicing and downstream sedimentation problems are eliminated.
- Compared to the other ALTERNATIVES, negative impacts are generally short-lived and corrected with mitigation measures.

Against the PROPOSED PROJECT and ALTERNATIVE 1

- Both will require continued sluicing to keep the fish ladder operational. This will result in the transport of significant amounts of accumulated sediment down the river channel. The increase in suspended and bedload sediment delivered to the lower river would impair aquatic habitat and directly affect redds and juvenile and adult steelhead in the river.
- AL-4 Both will require a fish ladder for fish passage.
- ATLERNATIVE 1 would require extensive sediment removal and transport over a relatively long distance.

Against ALTERNATIVE 2

- AL-5 It would require massive sediment removal and transport over a relatively long distance.

Thank you for your consideration of these comments. If you have any questions, please do not hesitate to contact me.

Sincerely,

Dougald Scott, Steelhead Committee Chair
Northern California Council of the Federation of Fly Fishers
(831) 427-1394, doscott@cruzio.com

Chairman
David Hirsch
Vice Chairman
Ralph B. Perry III
Secretary-Treasurer
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PLANNING AND CONSERVATION LEAGUE
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Coke Hallowell
Gerald H. Meral
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Andrea Sumits

June 30, 2006

Ms. Charyce Hatler
Department of Water Resources, San Joaquin District
3374 East Shields Avenue
Fresno, CA 93726-6913

Mr. Bob Smith
U.S. Army Corps of Engineers, San Francisco District
333 Market Street, 8th Floor
San Francisco, CA 94105-2197

Re: San Clemente Dam Seismic Safety Project draft Environmental Impact Report/Statement

Dear Ms. Hatler and Mr. Smith,

The Planning and Conservation League Foundation (PCLF) submits the following comments on the California Department of Water Resources and the U.S. Army Corps of Engineers' *San Clemente Dam Seismic Safety Project Draft Environmental Impact Report/Statement* (DEIR/S) of April 2006. We appreciate this opportunity to comment on this project and request careful consideration of these comments as well as those submitted by other organizations and individuals.

SA-6 It has been 26 years since the DWR's Department of Safety of Dams (DSOD) first began to look into the long-term safety of the San Clemente Dam and 16 years since an engineer hired by Cal-Am determined that the dam could fail in both MCE (Maximum Credible Earthquake) and PMF (Probable Maximum Flood) conditions.

Meanwhile, human life, especially the Camp Stephanie community directly downriver, remains in danger from dam failure resulting from an earthquake with a magnitude as low as 5.5.

AS/O-36 We urge you to select Alternative 3, dam removal and river reroute, as the preferred project to ensure the long-term safety of the residents of the Carmel River Valley as well as the continued protection and improvement of the environment that provides critical habitat for the "threatened" steelhead trout and California red-legged frog.

AS/O-37 We also find that leaving the dam structure in place (the "Proponents Proposed Project," dam thickening, and Alternative 1, dam notching) will result in significant and ongoing impacts to the environment and will not resolve the safety issue adequately. It will, moreover, burden the rate payers with the cost of maintaining and ultimately removing the structure at some point in the future.

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Furthermore, the technical design for "sluice gates" required for both the Proponents Proposed Project (PPP) and Alternative 1, is inherently flawed for several reasons. First, relying on the sluice gates as the primary method of sediment management will lead to significant unintended consequences caused by ongoing release of the sediments to prevent future build-up of sediment above the dam structure. The continuous release of sediment will result in impacts to water quality, will continue to cause degradation of habitat downstream of the dam site, and will assure that present trends in scouring just below the dam structure will also continue to occur. Both the PPP and Alternative 1 also require a fish ladder to allow fish passage above the dam structure that we believe will also threaten the survival of migrating steelhead unable to navigate safely through the area directly above the sluice gate, causing fish to become caught up in the downstream flow, and back downstream through the sluice gate. We believe that the fish ladder design and the flawed sluice gate design will result in a Jeopardy Opinion that will delay the start of a project indefinitely. For these reasons, it is clear that "Alternative 3" is the most viable and expedient alternative that will assure the long-term safety of the residents of the Carmel River Valley. It is also the least environmentally damaging, and therefore will move forward and expedite implementation of a project that will permanently remove the risk of dam failure associated with both MCE and PMF conditions as required by law.

FI-118
SED-71
FI-120
AS/O-38

We find that this DEIR/S is adequate if and only if the Lead Agencies select Alternative 3 as the preferred alternative for the following reasons:

First, "Alternative 3" should be the preferred alternative in the Final EIR/S because it is the best technical design and most expedient solution that assures the permanent resolution of safety issues.

Second, the Proponent's Proposed Project, dam thickening, runs the risk of drastic unintended consequences and will continue to compromise safety in the future as the dam structure continues to degrade over time, ultimately resulting in greater costs to the ratepayers. These include the cost of the current Proponent's Proposed Project, which provides a short-term solution at best, involving ongoing maintenance, operating and fish passage costs, and again in the future when the aging structure reaches the end of its life span. The Proponents Proposed Project also results in cumulative impacts to the environment under the Endangered Species Act, the Clean Water Act and the Porter Cologne Water Quality Control Act that will counter NEPA/CEQA criteria that may result in a Jeopardy Opinion by NOAA Fisheries and USFWS (Section 7 Consultation) delaying the project indefinitely.

AS/O-39

Third, the dam removal option and river reroute provides a technically superior and viable solution in a shorter time frame than either notching or dam thickening, assuring that the risk to human life and impacts to federally designated "threatened" species are reduced or completely eliminated as soon as possible.

Fourth, the public has clearly voiced its support for dam removal and river rerouting as demonstrated by public comments at the DWR/USACOE public hearing for the Draft EIR/EIS held in Carmel Valley on May 23rd and reported in the media (see attachment, "Carmel River Reroute Gets Solid Backing," Monterey Herald, May 24, 2006).

PCLF supports selection of Alternative 3, dam removal and river reroute as the preferred alternative because it is the only one that *guarantees* long-term safety, protects the environment, reduces adverse impacts to water quality, and preserves "threatened" steelhead and California red-legged frog. Furthermore, we find that the Draft EIR/S fails to fully assess the impacts of California American Water's preferred alternative, dam thickening, Alternative 1 (dam notching) or Alternative 2 (dam removal and transport of sediment to a nearby canyon), and therefore the Draft EIR/S is inadequate for assessing any of the other alternatives.

AS/O-39

We strongly urge DWR and USACE to consider public input and support for Alternative 3, and based upon the reasons cited above, select river reroute and dam removal as the technically superior design for a project that will permanently resolve the dam safety risk. PCLF will actively support the selection and implementation of Alternative 3, and will also continue to advocate for support by interested groups in the community and throughout the state for implementation of Alternative 3.

Thank you,

Mindy McIntyre
Water Program Manager
Planning and Conservation League Foundation

COMMENTS

1) The preferred alternative in the final EIR/S should be river reroute/dam removal.

The DEIR/S states, "The need for the San Clemente Dam Seismic Safety Project is to increase dam safety to meet current standards for withstanding a Maximum Credible Earthquake (MCE) and passing the Probable Maximum Flood (PMF) at the dam" (1-2). This statement indicates that the paramount objective is to protect human safety, which rerouting the river and removal of the dam accomplishes the best.

NEPA/ CEQA-40

Nowhere in the DEIR/S does it guarantee that the dam will survive a MCE with buttressing; that means the homes downriver are still in danger. If human safety is truly the first and foremost concern, buttressing must be looked at very critically, for it fails to fundamentally resolve the problem of an aging and unsafe dam, instead simply prolonging it.

SA-7

However, it is also very important, under CEQA, that the environment not be irrevocably harmed. Rerouting the river and removing the dam is the Least Environmentally Damaging Preferred Alternative (LEDPA). It will go a long way to restoring the watershed that once existed in the Carmel River Valley, as well as protecting the two species currently covered under the Endangered Species Act, the California red-legged frog and steelhead trout.

NEPA/ CEQA-41

The dam structure currently impedes the current survival of the steelhead trout. Even with a new fish ladder design, the "sluice gate" design poses a threat to fish passage that will require monitoring and modification, and perhaps lead to mitigation for ongoing impacts to steelhead. It is a stated goal for the steelhead resource to be maintained "as a self-sustaining resource and to restore it as much as possible to its historic level of productivity" (4-103). Only the removal of the dam will ensure that. The DEIR/S also notes that "the steelhead population in the Carmel River is threatened with becoming a remnant run due to the development of water resources, drought, watershed land use, and environmental problems" (4-103). Removing the dam will go a long way to preserving this endangered species. Dam removal and river reroute will restore natural sediment transport levels that can improve important spawning and feeding habitat conditions in the mainstream, and will also assure that migrating species can make their way to important spawning areas above the current dam site.

FI-121

Selecting Alternative 3 would ensure that the federal government does not issue a Jeopardy Opinion under the Endangered Species Act, which would further delay resolution of the dam safety deficiencies.

AS/O-40

We also note that there is no basis for rejecting Alternative 3 on cost grounds. The DEIR/S does not include any cost projections; naming the Proponent's Proposed Plan as the preferred alternative because Alternative 3 is too "costly" for CAW to afford would render the EIR/S inadequate. There are no cost estimations in the DEIR/S. Cost projections for all options are needed in order to fully grasp the financial aspect of this seismic safety project; seeing that there are none in the public record so far, Alternative 3 cannot be rejected.

CR-12

Lastly, Alternative 1 discussed in the DEIR/S, notching the dam to a lower level and creating sluice gates, fundamentally has the same problems as the dam thickening. Both leave a potentially unstable structure, and both use sluicing, which has forseeable difficulties discussed below. There are, moreover, water quality issues resulting from continuous release of sediment, primarily silt, that can result in increased turbidity that are essentially the same with both and which are not assess in the DEIR/S. Both the Proponent's Proposed Plan and Alternative 1 will have rising cumulative costs into the future associated with maintaining an aging structure, possibly needing modifications to address flaws in the technical design in the structural work over the decades projected for maintain the structure in the future. Neither is a permanent solution to the unsafe nature of the San Clemente Dam and will result in enormous ongoing costs to the rate payers.

AS/O-41

2) Alternative 1, CAW's preferred alternative, has many far-reaching consequences that are not covered in the draft EIR/S, and would need to be addressed before choosing that alternative.

It is likely, in our professional estimation, that simply buttressing the dam will have cumulative impacts. A primary impact is one that results from impacts to water quality resulting from the release of unknown levels of sediment, primarily silt, as the primary method to reduce the rate of build-up of sediment behind the dam structure. It is also likely that scouring patterns evident downstream of the dam site will also continue to occur, impacting fish habitat.

AS/O-42

The DEIR/S does not adequately cover the possible unintended consequences of dam buttressing; selecting that option will render the entire EIR/S inadequate due to lack of adequate analysis. It is very possible that buttressing will impede the upstream course of the steelhead trout even more than the poorly designed fish ladder currently does, despite the new proposed fish ladder design, due to proximity to downstream flow at the location of the sluice gates. This will further endanger the continuing survival of the steelhead trout in the Carmel River.

FI-122

The sluice gates, moreover, offer no guarantee of success, and in fact may actually result in a technically flawed sediment management strategy that will require costly modifications and mitigation that will increase the burden on the rate payers. It is very possible, if not likely, that they will be ineffective or fail to reduce the silt buildup behind the dam to an acceptable level. The sluice gates may also have the unintended consequence of impeding the movement of the trout up the river by creating a strong downward flow at the top that might capture fish in the current and force them back through the sluice gate downstream. Monitoring costs may be another factor escalating costs to the ratepayers.

CR-13

SED-72

FI-123

CR-14

Complete sediment removal remains a large problem when considering the dam buttressing and notching alternatives; it is thought by many that the sluice gates will not force larger pieces of sediment downstream, leaving their entire effect on sediment removal to be negligible, failing to restore the necessary variable elements of normal sediment flow including gravels and cobbles essential for wildlife stream habitat restoration.

SED-73

3) **The river reroute/dam removal option will also permanently remove the seismic risk and threat of a large-scale flood, and will achieve the required solution in a much shorter timeframe than the dam buttressing option.**

As discussed above, dam buttressing or notching is likely to result in the issuance of a Jeopardy Opinion concerning the California red-legged frog or steelhead trout, protected species. This would protract the process indefinitely with potential legal challenges requiring lengthy review. Meanwhile, the dam would remain, as it is now, dangerous to Camp Stephanie and other residential areas downstream of the dam. It is also likely that other environmental groups will intervene in order to challenge reconsideration of impacts to wildlife and habitat of the Carmel River Watershed that will result with the Proponents Proposed Project, or Alternatives 1 and 2. Therefore river reroute and dam removal is the most expedient solution that will guarantee the flood and seismic risks are permanently eliminated.

SA-8

If the Lead Agencies choose the Proponents Preferred Project or Alternative 1 or 2, it is likely that the Lead Agencies will be required to address inadequacy of the analysis of these alternatives in the DEIR/S, requiring the need to re-circulate the DEIR/S that will lead to further indefinite delays. We urge consideration of the first priority – to assure the safety of those living in the Carmel River Valley; the unsafe San Clemente Dam should be dealt with as soon as possible and therefore Alternative 3 is the technically superior project, with the most expedient outcome.

4) **It is clear that the public supports Alternative 3.**

AS/O-43

A *Monterey County Herald* headline states, "Carmel River Reroute Gets Solid Backing," and goes on to state, "A proposal to rechannel the Carmel River upstream from San Clemente Dam...got strong public support Tuesday night at a hearing held by state and federal officials at Rancho Cañada Golf Club" (the article is attached). At this well-publicized meeting, 22 people spoke in favor of the reroute with only three opposing. The public's wishes should be able to determine how they want to deal with a dam that is literally in its backyard. The reasons stated for supporting reroute and restoring normal flows and sediment levels to the lower river basin ranged from desiring to improve public recreation (kayaking and hiking), wishing to see the river and health of wildlife recover, wanting to see traditional benefits to the community regained through improved river conditions, and recognizing that buttressing is only a "band-aid" solution that assures future costs and an ongoing burden for the rate payers.

AS/O-43

Strong public support is crucial to staging a successful project. DWR and USACE should take the broad public support for Alternative 3 into careful consideration when selecting a preferred alternative.

Conclusion

The San Clemente Dam as it is today is a dam that is unsafe for both a large-scale earthquake and large-scale flood. The DSOD has made it clear for over a decade that the dam cannot remain in its current state and Cal-Am must alter or remove it to guarantee human safety.

The only option that would make the draft EIR/S on the San Clemente Dam adequate is Alternative 3, dam removal/river reroute. With broad public support for this option, it is clear that the residents affected by these proposals, the ones who will have to shoulder any rate increases, support the removal of the dam and the river reroute.

AS/O-44

The dam/removal and river reroute option is the only one that:

- Guarantees the safety of the Carmel River Valley region in the case of an earthquake or major flood
- Adequately protects the several endangered species and recovery of critical habitat in the valley
- Ensures other benefits are protected including water quality standards

We support the DEIR/S in its current form and urge its adequate completion by selecting Alternative 3 as the preferred alternative.

Carmel Valley: Rechannel would run parallel to San Clemente Creek

Carmel River reroute gets solid backing



Water is released through a series of holes that were drilled into San Clemente Dam in Carmel Valley. Cal Am officials estimate the dam may be in danger of collapsing if a large earthquake occurred. Fred Feizollahi, senior operations engineer, walks across the San Clemente Dam.

VERN FISHER/Herald File

San Clemente Dam

Constructed: 1921

Water capacity: 2,000 acre-feet

Originally: 1,200 acre-feet

Sediment built up: 2.4 million cubic yards

1992: Division of Dam Safety reports the dam is not earthquake safe

2013: Six holes are drilled in the dam to relieve water pressure

Alternatives:

- Tear down the dam and remove the sediment
- Shore up the dam to prevent it from collapse and leave the sediment
- Notch or partly lower the dam and leave the sediment
- Tear down the dam and reroute the Carmel River while leaving most of the sediment in place
- Do nothing

By KEVIN HOWE
Herald Staff Writer

A proposal to rechannel the Carmel River upstream from San Clemente Dam so it will flow parallel to San Clemente Creek on to Carmel Valley got strong public support Tuesday night at a hearing held by state and federal officials at Rancho Cañada Golf Club.

Rerouting the river by cutting through a spur of hillside separating the river from the creek, and allowing water behind the dam to flow backward through it, would allow the dam to be torn down and avoid having nearly 2,000 acre feet of silt built up behind it over the past 85 years to clog the river, said Jeremy Pratt, project manager for the consulting firm of ENTRIX Inc.

> "It's an extremely complex project. It involves a lot of issues. But dam safety is driving the process."
>
> — David Gutierrez, Department of Water Resources assistant director of strategic planning

ENTRIX is writing the environmental impact report on the dam for owner, California American Water Co.

The silt, he said, would be stabilized with a groutlike substance so it wouldn't flow. Leaving it in place would protect the California red-legged frogs that have made the silted-up reservoir their home.

Taking out the dam would eliminate a major physical barrier to upstream migration of steelhead salmon. Thus, two species listed as endangered would be aided by the alternative.

"It is the most environmentally, economically and socially responsible alternative," said Jonas Minton, senior project manager for the Planning and Conservation League, which supports the reroute-teardown approach.

Other alternatives offered by Pratt at the

Please see **Dam page A12**

Dam

From page A1

meeting were doing no project — it was "not feasible," he said, thickening the dam's walls and replacing the antiquated fish ladder built with it, cutting down or "notching" the dam and removing 930 acre feet of silt, and removing 1,555 acre feet of silt and tearing down the dam.

The plans all have their pluses and minuses.

"It's an extremely complex project," said David Gutierrez, assistant director of strategic planning for the state Department of Water Resources. "It involves a lot of issues. But dam safety is driving the process."

San Clemente Dam was built in 1921 to hold back 2,000 acre feet of water. Now it mostly holds back mud.

Its storage capacity is about 100 acre feet, Gutierrez said, and San Clemente, a thin concrete arch dam, was built before engineering for earthquake safety was well understood.

In 1992, the state Division of Dam Safety reported that San Clemente could give way in an earthquake of a magnitude 5.5 on the Tularcitos Fault, which it straddles, or of a magnitude 7 on the San Andreas Fault.

The dam has been subject to overspilling during high flood seasons, and water running over the top could erode rock on either side, causing the dam to break, Gutierrez said.

A 1997 analysis by state safety experts indicated a dam failure would send 100 to 150 acre feet of water and a flood of mud downstream as far as Camp Stefani on the Carmel River, resulting in 1 to 6 feet of flooding.

"It never was a flood-control dam," Gutierrez said, "and there is very little storage left."

Some precautions have been taken. In 2004, the dam was pierced with pipes to drain off water behind it, but they don't provide enough of an opening to prevent water from washing over it during floods, Gutierrez said.

The dam has been fitted with instruments to detect earthquakes and issue an automatic warning to fire stations downstream.

Pratt said thickening or notching the dam could be done in four years, and removing it and the silt in five.

The silt would be removed by conveyor belts rather than trucked away, he said, avoiding the spectre of roads clogged with dump trucks hauling out Carmel Valley.

Buttressing the dam is the cheapest alternative, but the river rerouting and dam demolition project has emerged as the second cheapest alternative, Pratt said, and it could be done in four years.

Demolition and silt removal would cost the most and temporarily destroy the frogs' habitat, while "notching" the dam is the second most costly project. Even if no project were done, Pratt said, Cal-Am would still be required to replace the fish ladder.

With the dam gone, there would be no need for fish ladders or continued maintenance of any dam structure that remained.

Heavy equipment and truck traffic would be routed to the dam-project site via Cachagua Road, Pratt said, while construction crews would drive through the Sleepy Hollow neighborhood.

Roger Williams of Carmel spoke in favor of the rerouting project, but questioned whether the silt should be held in place, rather than gradually released downriver. "Dams have blocked flows of sand, gravel and stones to the state's beaches, he said, contributing to their erosion over time.

Robert Greenwood of the Carmel Valley Association questioned what would be done with tons of concrete from the dam if it is torn down.

Victoria Kennedy, president of the Sleepy Hollow Homeowners Association, whose neighborhood would be affected by construction traffic on San Clemente Drive, said residents were concerned about dust and noise from the concrete batch plant that would have to be set up to do the dam buttressing if that alternative is chosen.

She asked how traffic would be controlled or permit requirements enforced for any of the projects.

"What remedy would we have? What is the penalty for noncompliance? Who has control of the site? Who will enforce compliance or determine the amount of repairs necessary?"

Removal of the dam and rerouting the river is the best solution, said Monica Hunter of the Planning and Conservation League.

"We need to eliminate these costly Bandaids" from consideration, she said. Frank Emerson of the Carmel River Steelhead Association agreed.

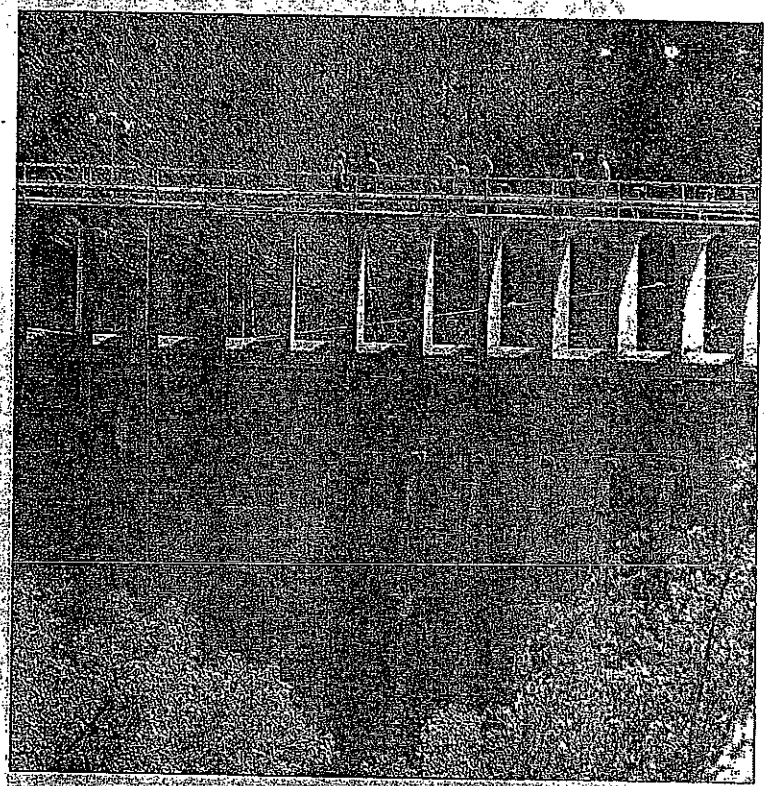
"If ever a dam was crying out to be removed, it's San Clemente," he said.

Clive Sanders of the Carmel River Watershed Conservancy said the cost of fixing San Clemente "can't be borne entirely by the owner. If we're going to have major demolition of the dam, we need federal help."

Written comments on the alternatives will continue to be received through July 3, said Jane Hicks, regulatory branch chief for the Army Corps of Engineers' San Francisco District.

Comments may be sent to: Paula Landis, chief of the California Department of Water Resources San Joaquin District, 3374 E. Shields Ave., Room A-7, Fresno 93976; or Robert Smith, project manager, U.S. Army Corps of Engineers San Francisco District, 3333 Market St., San Francisco 94105.

Kevin Howe can be reached at 646-4416 or khowe@montereyherald.com.



DAVID ROYAL/Herald file

Citizens and officials from the Department of Water Resources for the State of California Army Corps of Engineers and California American Water tour the San Clemente Dam in Carmel Valley in 2003.

Paula

US Army Corps of Engineers May 24, 2006

California Department of Water Resources

RECEIVED
JUN 2 0 2006
ENTRIX - SEATTLE

San Clemente Dam Seismic Safety Project

AA-1 The report and recommendations should take into consideration the environment, preservation, conservation, water resources and economics of the project. The solution to all of five of these goals is to save the existing dam by reinforcing. The sediment should be moved from the back of the dam to the front of the dam and placed as a buttress. The buttress should be large enough to allow drying of the sediment to about 5% over optimum or should be partially dried prior to being moved. A conveyor could be used to move the sediment to the down stream side of the dam. The equipment used to move, place and compact the material should stay a safe distance from the dam to protect it from damage. The placing of the fill against the dam should be done by hand and might be done in accordance with a structural backfill. The buttress should be capped in order to protect it from erosion. The capping material could be with a soil cement or concrete. An extended spill-way should be constructed across the buttress and a fish ladder must be constructed in accordance with the latest standards.

AA 2 The alternative plan to demolish the dam will have a severe impact on Carmel Valley Road unless the broken concrete and steel are buried on site. A preferable alternative to off haul or burying broken concrete in place is to partially burying the dam intact by buttressing it on the downstream side up to the level of the outflow or top of spillway. Just the top of the dam will be visible from down stream and the

AA-2 dam can serve as a walkway.

The dam can serve many functions if left in place and strengthened. It can be managed to serve as flood control
HY-1 protection which would help protect the Carmel River Basin.
TE-1 A dam will support wild life and migrating birds. Water storage can offset the use of energy used to produce water
WAT-1 by reverse osmosis (the cost of energy has become an important political issue.) The demolition of the dam will be very costly and will ultimately be paid by the consumers or
CR-1 tax payers. Court costs may be involved in some proposals being discussed.

The three most important issues to address are the safety of the dam, a sustainable water supply and the cost of the
SAF-1 project. The worst case scenario of environmental degradation would be the "no project alternative followed by an earth quake and dam failure". The other alternatives will need a environmental mitigation plan. Rerouting the river will likely require significant clearing. The strengthening of the dam with steel and concrete will involve the on site batching of concrete and delivery of cement, steel, and probably aggregate (or screening and washing on site). None of the options will
TE-2 protect the habitat of the Red Legged Frog completely, but the habitat can be moved and recreated without harm to the
FI-1 frogs. Enlarging the lake by removing the silt will enhance the fish and bird habitat.

There appears to be support for the rerouting of the Carmel River because it addresses the sedimentation problem and
AA-3 eliminates the dam. However cutting a whole new river bed could involve significant damage to the environment.

In most cases the least environmental damage will be

achieved with the least amount of work and materials. The alternative with the fewest materials and workman is the best and cheapest option and that option is a buttress of sedimentary material. The program to protect the Red Legged Frog and the Steelhead should be adequate for its purpose, but should not impact a common sense approach that recognizes the cost, water resource, disruption to neighbors and other environmental issues.

AA-4
FI-2
TE-3

The concept that dams harm the environment by capturing sediment is about 99% wrong. Down stream sedimentation creates far more problems than it solves. Sedimentary buildup will usually lead to flooding and additional erosion caused by flow blockage. As the Grand Canyon is proof sediment usually ends up in the mouth of the river, bay or ocean. The use of rubber dams in the Carmel River could be a means of diverting water to underground storage. Rubber dams are filled with water to weigh them down. If the water level behind them is allowed to get to high, they can float or slide downstream. Rubber dams are specialized tools that are only good for specific conditions.

SED-1
WAT-2

The removal of the existing dam is a radical concept serving only one purpose, that should be addressed by the latest federally approved fish ladder. The removal of the dam will destroy many benefits without accomplishing a single benefit that can't be addressed by a government approved method. There is no cost-benefit ratio to consider because there is no benefit in removing the dam.

AA-5

I am Don Redgwick of 1398 Pico Ave. in Pacific Grove, 93950 and I favor salvaging the San Clemente Dam with a buttress.

AL-29

Don Redgwick

PHONE 831-655-3418

June 4, 2006

US Army Corps of Engineers
California Department of Water Resources

CEQA Lead: Department of Water Resources,
San Joaquin District
3374 East Shields Avenue
Fresno, CA 93726-6913

Attn. Charyce Hatler

A copy of my May 24, 2006 letter is enclosed for your convenience. This letter is intended to supplement and clarify my previous letter.

AA-6 If the geological conditions have been adequate to support the San Clemente Dam for the past 85 years, the conditions should be adequate for an earth dam. If the site is adequate for an earth dam it will be adequate for a buttress utilizing earth dam technology such as key cuts and an impervious core. The impervious core probably should be placed against the concrete dam. Since the sedimentary material is most likely pervious it might require being encapsulated to prevent erosion.

AA-7 The realignment of the Carmel River and the removal of the San Clemente Dam poses more questions than it answers.
(1) Is the plan to realignment the river permanent or a diversion for construction?
(2) Where will the excavated earth from the realignment be placed? TE-4
(3) If the realignment is permanent doesn't that significantly reduce the dam safety and steelhead issues and allow the dam to remain for the benefit of frog, bird, lake fish, and other wildlife habitat? FL-3
(4) If the dam is removed won't that leave a vertical bank of about 70 to 80 feet of material subject to erosion. Will a grout be adequate to contain the sediment from erosion?

TE-5 (5) If the dam is removed and the sediment is grouted, will that make a satisfactory habitat for the Red Legged Frog?

TE-4, con't
FI-3, con't

(6) Conversely if the Carmel River is rerouted on a permanent basis and the San Clemente Dam is left in place with or without a buttress, would that provide a superior habitat for frogs, birds, lake fish and other wild life?

AA-8

(7) If the Carmel River is rerouted could a fork in the river be created with control gates to allow a cleansing of the San Clemente Dam site or for temporary diversion for maintenance on the new river alignment?

AA-7 con't

(8) If the San Clemente Dam is demolished and removed won't that result in a 70 or 80 foot thick embankment of unstable sediment? Will the gradient become much steeper when the sediment is spread? Will a grout be used to stabilize the sediment? If a grout is utilized for containment will that provide a suitable habitat for frogs and other wildlife?

TE-5 cont'

AA-9

(9) The existing dam could serve an important function in the development of a diversion plan for the building of a buttress. However, information about the diversion plan used in the building of the dam in 1921 could lead to the locating of an abandoned tunnel. Does the County, State, Cal Am or someone else have documents from the original construction?

SED-2

(10) The loss of capacity of the Dam after the Marble Cone Fire and other years of heavy erosion could be an indicator of future erosion and sediment. Sediment seldom settles on the beaches or other preferred areas as some people seem to believe. Water Pollution Control Boards have been known to fine Contractors, Developers and others large sums of money for less than a truck load of dirt washing into a stream. Fish and Game requires a plan to be submitted and approved showing facilities and a program to control erosion. Flood Control Agencies spend millions of dollars annually in maintenance to control erosion and to stabilize river banks.

SED-3

(11) If the San Clemente Dam did not exist prior to the Marble Cone fire, what would be the estimated damage to Carmel Valley and Carmel Meadows? Would 2.4 million yards or more be in Carmel Bay if the dam was never built or would some of it have been trucked from homes, streets and parks?

NEPA/
CEQA-1

CEQA proposals should include a cost benefit analysis. I see no environmental benefit to removing the dam except the questionable conclusion that fish ladders don't work. The environmental issues

relating to frogs, birds, lake fish, deer, bears, mountain lions etc. appear to be forgotten. The value of the dam as a source water and a protection from water pollution caused by watershed erosion is being ignored. Lastly the cost of removing the dam and containing the sedimentary material will be more expensive than buttressing it. A buttress would utilize a portion of the sediment and would partially bury the dam on the down stream side up to a spillway level. This would be a cost benefit greater than off hauling the material and probably less expensive than the rerouting option. I don't know the magnitude to the rerouting proposal, but it could involve a huge dirt moving cost. If the benefit is removing the dam because fish ladders don't work according to some people, I think the other environmental issues should be considered. Dam safety is the primary consideration, but strengthening the dam with concrete or a buttress should not be ignored. David Gutierrez of the State Department of Resources said, "it's an extremely complex project" and "it involves a lot of issues, but dam safety is driving the process" I believe the most important issues are developing a diversion plan for the river during construction, doing the work with as little negative impact on the Carmel Valley Community as possible, mitigating the environmental impacts even handedly, considering the value of the dam as a settlement basin and calculating the cost benefit ratio of the various proposals without succumbing to political pressure from single interest groups.

NEPA/ CEQA-1

AA-10

GEN-1

The study should include comments on the containment of the sediment and the damage that 2.4 million yards of sediment would have caused during flood years and the benefits or harm that trees, silt and debris can do when not contained.

SED-5

I believe strengthening the San Clemente Dam is the logical course of action for all of the issues I have addressed and the proposal to eliminate the dam is the worst idea in all counts except a possible advantage to ocean fish.

AL-3

I am Don Redgwick of 1398 Pico Ave. Pacific Grove, PO Box 51879 Pacific Grove, CA. 93950 phone 831-655-3418



INSPIRING RESTORATION OF CULTURE,
COMMUNITIES AND HABITATS.

Cheryce Hatler
Department of Water Resources
San Joaquin District
3374 East Shields Ave
Fresno, CA 93726-6913

6/15/06
Dear Cheryce and Other Members,

Thank you for this opportunity to voice public opinion and questions regarding the fate of the San Clemente dam and its impact on the Carmel River and the community so that they can be addressed in the EIR. RisingLeaf Watershed Arts is dedicated to sustaining the beauty of this area for the appreciation and enjoyment of current and future generations. We believe that the Carmel River has outstanding scenic beauty and that the presence of a flowing river has substantial psychological, recreational and inspirational benefit for the community. We would love to see the River cared for, not just as a source of water, but as a living being and as a source of life and joy for many living creatures as well as for future generations:

AL-8 We are in favor of the alternative for the River reroute and the stabilization of the sediment; however, we would like to propose some areas, which we feel deserve further consideration and where we feel there are additional questions which should be addressed:

A) Best use of area behind the dam:

SED-39 We feel that the sediment and the area behind the dam is now being looked upon as a liability, but that it should instead be looked upon as an asset. We have the following questions in regard to its potential beneficial uses:

TE-16 1) What is the best use of the area behind the dam? Could it become a flood plain? Could it become a meadow? Could it become a marshy area and habitat for birds, frogs, etc? What is the best use of this area both from an ecological point of view and from a human use point of view?

GEN-16

The community has rallied strongly behind the restoration of the lagoon and I am sure would support restoration projects in this area as well.

B) Best use of sediment behind the dam:

SED-40

1) What is the best use of the sediment behind the dam for the long-term ecology and human use? Is the silt best returned to the ocean by a many year process to re-sand the beaches? Is it best to let the silt remain for an ecological purpose, i.e. as a habitat, as a base for growing a meadow or woodlands?

C) Sediment Stabilization:

AA-44

Rather than using an artificial substance to stabilize the sediment, we would like to propose using trees and other roots as a stabilizing force. Roots naturally jell sediment into place and then serve the dual purpose of forming a habitat. With man-made substances, there is always the issue of pollution and of long-term degradation and failure. We feel that nature itself can provide the safest and surest long-term solution to holding the sediment in place. We would like to see the following questions addressed:

1) Why would a manmade substance be used for stabilizing the sediment when nature has a proven and long-term effective method of stabilization?

2) How could trees and vegetation be planted and used to stabilize the sediment?

TE-17

3) What natural plants and trees could stabilize the sediment and at the same time provide the best habitat for red-legged frogs or for migrating and local birds?

4) What are the potential hazards of using a manmade jell? What long term mitigating measures would then be required? What would the economic cost of this be?

AA-44

Thank you for addressing these questions and for trying to find the best alternative for dealing with the dam.

Respectfully,

Pam Krone-Davis

Pam Krone-Davis
President
RisingLeaf Watershed Art

June 14, 2006

Mr. Lewis Rosenberg
P.O. Box 1693
Tijeras, NM 87059

Ms. Charyce Hatler
California Department of Water Resources
San Joaquin District
3374 East Shields Avenue
Fresno, CA 93726-6913

Dear Ms. Hatler:

I read the San Clemente Dam Seismic Retrofit Project Draft Environmental Impact Report/ Environmental Impact Statement (Draft EIR/EIS) and have some concerns regarding the seismic hazards analysis presented in the Draft EIR/EIS. My concern is that the document lacks current and accurate information in the Geology and Soils section. For clarity, my comments are numbered and listed below.

GEO-7

1. The Draft EIR/EIS presents an uneven emphasis of the various constraints to the proposed project. Specifically, the "Geology and Soils" section is only 13 pages long, whereas other constraints are discussed in more detail, for example, the fisheries section is 61 pages long, and the traffic and circulation section is 53 pages long. No doubt that each of the environmental setting areas is important, but for a proposed project with "seismic retrofit" in the title, there should be more detail on the seismic constraints, even if the information in included in an appendix section.

GEO-8

2. The State of California Business and Professions Code section 7832 (person practicing or offering to practice geology subject to provisions of Geologist and Geophysicist Act) and section 7872(a) (practice without legal authorization), require that the preparer of the geology section is licensed as a Professional Geologist by the State of California Board for Geologists and Geophysicists. On page 6-2 of the Draft EIR/EIS, Mr. Rick McCartney is listed as the preparer for the geology subject area. The State of California Board for Geologists and Geophysicists website shows a "Richard F. McCartney" license PG5140. However, it is unknown if this is the same person as the report preparer.

   Because the proposed project strongly affects public safety, the geology preparer should be a California-licensed Professional Geologist (preferably also a Certified Engineering Geologist), and should sign the report as required by section 7835 (required preparation of plans by Professional Geologist - signing or stamping with seal).

GEO-9

3. The regional geologic map (Figure 4.1- 1: Geology of the Site Vicinity) is not the current published geologic map. Although the citation on figure 4.1-1 is from the "2000 RDEIR produced by Denise Duffy & Associates," the map is likely from Converse Consultants 1986 report on "New San Clemente Project preliminary design and cost estimate." The most recent published map of the area is the *"Geologic map of the Monterey Peninsula and Vicinity"* by T.W. Dibblee, Jr. (published in 1999 by the Dibblee Geologic Foundation as their map DF-71). Much of the geology on the Duffy and Dibblee maps are similar owing to that Dibblee's mapping was the source material. However, figure 4.1-1 should incorporate the 1999 Dibblee map because it is printed in color and easier to read, but most importantly, the map shows the faults differently than the Duffy map. For example, the Dibblee map depicts an east-west striking fault approximately 1/2-mile southwest of the existing reservoir. This fault is not shown on the Duffy map.

4. The discussion of regional seismicity (page 4-5) contains obsolete terminology for fault activity as defined by the California Division of Safety of Dams (DSOD). The term "capable" is no longer used by the DSOD to describe faults that show displacement at or near the ground surface within the last 35,000 years. Instead, the DSOD uses the terms "Latest Pleistocene active fault" and "conditionally active fault" to describe faults with movement in the last 35,000 years (*W.A. Fraser, 2001, Fault activity guidelines of the California Division of Safety of Dams: California Geological Survey Bulletin 210, p. 319-325*). The Draft EIR/EIS should evaluate the fault activity of the Cachagua and Tularcitos Faults using current DSOD methodology.

GEO-10

The discussion of fault activity does not use the most current information. The geotechnical report commissioned for the proposed New Los Padres Dam (*The Mark Group, Inc., 1995*) contains detailed evaluation of the activity of the Cachagua Fault, which is the closest fault to the San Clemente Dam. The Mark Group report uses geomorphic evidence to show that the Cachagua Fault has not moved within the last 85,000 years. Work by L.I. Rosenberg and J.C. Clark (*Quaternary faulting of the greater Monterey area: report to USGS National Earthquake Hazards Reduction Program, 1994*) used radiocarbon dating to demonstrate Holocene activity on the Tularcitos Fault. These more recent reports help address the issue of "of great importance from the point of view of dam design is the question of whether nearby faults are active or not" (Draft EIR/EIS, page 4-5).

GEO-11

The section on ground shaking (page 4-5) covers the time period from 1800 to 1985, but leaves out the last 21 years. A search of the Northern California Earthquake Data Center database as of June 14, 2006 shows 53 earthquakes of magnitude 4 or greater since 1985 within 60 km of the dam, which are the same parameters in the Draft EIR/EIS. The analysis of earthquake recurrence intervals should be revised to include these more recent data.

GEO-12

There is no discussion of the effects of earthquakes on San Clemente Dam, such as the 1989 M 7.0 Loma Prieta earthquake. What were the effects of the Loma Prieta earthquake on the San Clemente Dam? The section also does not discuss effects of other large local earthquakes such as the 1926 M6.1 Monterey Bay doublet or the 1984 M4.9 Big Sur earthquake. Does Cal-Am have repair records for the San Clemente Dam that would provide information on the effects of these earthquakes on the dam? If so, these should be reported to help understand how the dam performs during earthquakes.

GEO-13

5. The section on dam site geology (p. 4-5 to 4-6) does not really describe the site geology, other than to relate that "the dam site is underlain by granitic rocks and smaller amounts of older metamorphic rocks now included in the granitic mass." The various geologic reports done by Rogers E. Johnson and Associates for the proposed New San Clemente Dam project provide much useful information about the dam site geology. These should be summarized in a revised dam site geology section.

GEO-14

This section also contains evaluation of the Maximum Credible Earthquake (MCE) and estimated peak acceleration of specific faults. These topics would be better placed in a seismology section. Nevertheless, there are some technical difficulties with the Draft EIR/EIS. The DSOD uses maximum earthquake magnitude, slip rate, fault type, distance to the site, and geologic site conditions to evaluate earthquake hazards (*W.A Fraser and J.K. Howard, 2002, Guidelines for the use of the consequence-hazard matrix and selection of ground motion parameters: California Division of Safety of Dams*). Only distance to the site and geologic site conditions are discussed in the Draft EIR/EIS. The other topics should be provided in a revised section.

GEO-15

The information in table 4.1-1 (estimated peak acceleration of faults) is based on vague assumptions and outdated methodology. First, the "estimated Maximum Credible Earthquake magnitude (local)" is unclear because as the report disclaims, "Magnitudes and peak horizontal accelerations are based on assumed fault capability. The capabilities of these faults have not been rigorously investigated."

GEO-16

GEO-16

In order for the reader to evaluate if these magnitudes are appropriate for the individual faults, the fault rupture length and fault-length vs. magnitude method needs to be specified for each fault.

GEO-17

Second, the cited "estimated peak horizontal acceleration 50th percentile" uses the equations of "Hoyner [sic] and Boore (1981)." The work of Joyner and Boore (1981) has been superceded by Boore and others (*Seismological Research Letters, v. 68, no. 1, 1997*) that reflects post- Loma Prieta and Northridge earthquake ground shaking equations. Using these older equations could result in accelerations that are too low; which is a critical concern for the proposed project. The accelerations should be recalculated using current ground shaking equations and include the site class and site period used in the calculations. In addition, the DSOD recommends using the 84th percentile acceleration in cases of high or extreme consequence (*Fraser and Howard, 2002*), so it might be necessary to include additional percentile statistics if the proposed project falls into these categories.

GEO-18

Third, it is unclear as under what conditions the dam is unstable. Is it the 0.9 "g-force" (cited as footnote 6 in table 4.1-1), or is it the 0.68*g* peak horizontal acceleration for the Tularcitos Fault (listed in table 4.1-1)? It is unclear as to whether the dam will fail at one of the maximum postulated ground motions, or is it so unstable that it will fail at a lesser ground motion. Provide the ground motion at which the dam is calculated to fail so the reader can better understand the dam stability. Without an accurate assessment of ground motions, it difficult to evaluate if the proposed project meets the purpose of "to meet current standards for withstanding a Maximum Credible Earthquake" as stated in the Draft EIR/EIS, information cover sheet. Otherwise, how do we know that the impact of thickening the dam is "less than significant"?

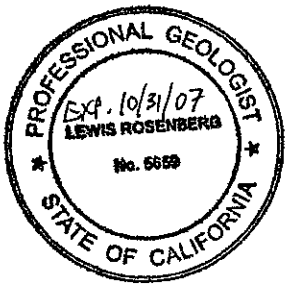
GEO-19

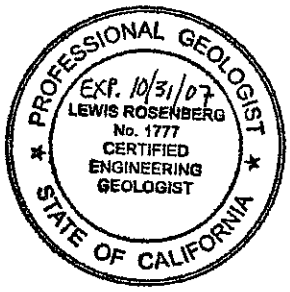
6. The section on landslides could have more detailed information. It states that a landslide could be triggered by a seismic event, but cites a 1998 report by Woodward-Clyde Consultants that the abutments were found to be stable. Yet, on page 4-9 of the Draft EIR/EIS, it states that "landslides could be triggered during the construction or operation of the Proponent's Proposed Project by oversteepening hillsides during the improvement of access routes," the discussion of which is not included in the "Environmental Settings" section. Nor is there any discussion of Reservoir Landslides/Slope Stability (Issue GS-3) in the "Environmental Settings" section. It would be useful to include the Woodward-Clyde report and the information used for the reservoir landslides as appendices, or to at least provide some details of the analyses to help the reader to draw their own conclusions from the data.

In conclusion, the Draft EIR/EIS needs to be revised to include current and accurate geologic and seismic information in order for decision makers to evaluate the proposed project alternatives. I look forward to seeing a revised version.

Sincerely,

Lewis Rosenberg
Calif. Professional Geologist 5659
Calif. Certified Engineering Geologist 1777





Chrisyce

CLAUDE & BETTINA ROSENTHAL
1653 Terrace Way
Santa Rosa, CA 95404

RECEIVED
JUL 03 2006
ENTRIX - SEATTLE

Paula Landis, Chief
Calif. Dept. of Water Resources
San Joaquin District
3374 East Shields Ave. Rm A7
Fresno, CA 93726

Dear Ms. Landis,

I am writing to urge you stop the plan to buttress the San Clemente Dam on the Carmel River. The dam has been deadly to migrating fish and adds little value to downstream users. In fact, I urge you to plan for the removal of this dam, ASAP. AL-7

Thank you for this consideration.

Respectfully,
Claude Rosenthal

Carmel River Watershed Conservancy

June 30th 2006

Ms. Charyce Hatler
Department of Water Resources, San Joaquin District
3374 East Shields Avenue
Fresno, CA 93726-6913

Mr. Bob Smith
U.S. Army Corps of Engineers, San Francisco District
333 Market Street, 8th Floor
San Francisco, CA 94105-2197

Re: San Clemente Dam Seismic Safety Project draft Environmental Impact Report/Statement

Dear Ms.Charyce Hatler and Mr. Bob Smith,

The Carmel River Watershed submits the following comments on the California Department of Water Resources' and the U.S. Army Corps of Engineers' *San Clemente Dam Seismic Safety Project Draft Environmental Impact Report/Statement* (DEIR/S) of April 2006. We trust that those who have the responsibility to review these comments take into account that this not the first or second nor the third opportunity to present comments most of which have fallen on deaf ears.

AS/O-27

We urge you to select Alternative 3, river reroute and dam removal, as the preferred project to ensure the long-term safety of the residents of the Carmel River Valley as well as the continued protection and improvement of the environment that provides critical habitat for the "threatened" steelhead and California red-legged frog.

We believe there is much study still needed on the whole process of ensuring that the end result is a river that Steelhead will be able to negotiate, work needed to ensure proper mitigation for the Steelhead and Red Legged Frogs during the years that a decommissioning will take place. May we expect an opportunity to review this material when it is assembled from the studies that have gone before.

GEN-37

Yours faithfully,

Clive R. Sanders, President

P.O. Box 223833 Carmel CA 93922.
Tel: 831-624-1064
WebPage www.carmelriverwatershed.org/

Santa Cruz Fly Fishermen

PO Box 2008
Santa Cruz, CA 95063
www.santacruzflyfishermen.org

June 8, 2006

Charyce Hatler
Department of Water Resources,
San Joaquin District
3374 East Shields Avenue
Fresno, CA 93726-6913

Re: San Clemente Dam Seismic Retrofit Project, Draft EIS

Dear Ms. Hatler,

Thank you for the opportunity to comment on the Draft Environmental Impact Statement for the San Clemente Dam Seismic Retrofit Project on the Carmel River. Enclosed for the record and your consideration are the comments from the Santa Cruz Fly Fishermen, supporting ALTERNATIVE 3:

AL-2 CARMEL RIVER REROUTE AND DAM REMOVAL.

The Santa Cruz Fly Fishermen is a club of about 150 Monterey Bay area citizens who not only share a love of fly fishing, but are also dedicated to the preservation and enhancement of fish populations in California. This project presents a unique opportunity to help restore the largest steelhead population south of Monterey Bay, and as such we feel compelled to comment.

In support of ALTERNATIVE 3:

- It would permanently eliminate safety concerns through the removal of the dam.
- It would permanently eliminate the fish passage barrier.
- It would permanently minimize temperature increases during passage through the reservoir site.
- AL-3 It would require a minimum of sediment removal, and not require long distance transport of the sediment. Under this alternative, sediment need only be transported a short distance from the San Clemente arm to the Carmel River arm.
- Sluicing and downstream sedimentation problems are eliminated.
- Compared to the other ALTERNATIVES, negative impacts are generally short-lived and corrected with mitigation measures.

Against the PROPOSED PROJECT and ALTERNATIVE 1

- AL-4 Both will require continued sluicing to keep the fish ladder operational. This will result in the transport of significant amounts of accumulated sediment down the river channel. The increase in suspended and bedload sediment delivered to the lower river would impair aquatic habitat and directly affect redds and juvenile and adult steelhead in the river.
- Both will require a fish ladder for fish passage.
- ATLERNATIVE 1 would require extensive sediment removal and transport over a relatively long distance.

Against ALTERNATIVE 2

- AL-5 It would require massive sediment removal and transport over a relatively long distance.

Thank you for your consideration of these comments. If you have any questions, please do not hesitate to contact me.

Sincerely,

Dougald Scott, Conservation Chair
Santa Cruz Fly Fishermen
(831) 427-1394, doscott@cruzio.com

John G. Williams, Ph.D.
Environmental Hydrology

13 June 2006

Gillian Taylor
Ventana Chapter, Sierra Club

By Email

Dear Gillian,

Here are my comments on the San Clemente EIR. Let me note at the outset that I am not a strong proponent of any of the alternatives considered. My comments focus on issues related to geomorphology, steelhead and steelhead habitat.

Descriptions of the long term consequences of the alternatives are inadequate.

The DEIR considers alternative treatments of San Clemente Dam, constructed in the early 1920s, and of the sediment that almost fill its reservoir. The salient lesson of the whole affair is that the long-term eventually happens. However, the DEIR does not adequately address the main long-term differences among the alternatives. The reinforcing and notching alternatives will leave a large amount of alluvial riparian habitat upstream from the dam. The removal and by-pass alternatives will not, but will result instead in more canyon habitat and upland habitat. There are real trade-offs between these, but the DEIR does not present the long-term consequences of the alternatives clearly enough to allow an informed choice among them. Presenting such an analysis would require some thought and effort, but it does not seem impossible. Generally, the analysis could be based on evaluations of habitats in the basin that are similar to the expected final results of the alternatives. For example, the channel upstream from the San Clemente Reservoir could be taken as a proxy for the habitat that would be restored by the dam removal alternative. For the reinforcing and notching alternatives, analysis could be based on existing alluvial habitat in the upper valley, or from a projection of the developmental trajectory of the habitat that now exists in the filled portions of the reservoir.

TE-7

In terms of steelhead, the major tradeoff is that the dam removal alternatives should facilitate fish passage, but the canyon habitat would be less productive biologically than the alluvial habitat that would remain in the other alternatives. However, the DEIR does not provide enough information for this trade-off to be assessed. For example, in the notching alternative, in Section 3.3, the DEIR states at p. 3-40 that "Accumulated sediment would be removed down to the level of the notch," or 506 ft. However, at p. 356, it states that the new surface "would be at about the same grade as the current sediment surface," but lowered by about 19 feet. Then, a channel shaped to carry approximately the two-year flow would be constructed, and the whole would be revegetated. However, constructing channels is not so simple (e.g., Kondolf et al. 2001), and the DEIR does not even provide relevant information such as what the existing gradient of the stream actually is. Put differently, there is an extensive channel reconstruction element to this alternative, but unlike the elements of the project that would occur at the dam itself, the channel reconstruction is described only vaguely. As another example, in the discussion of the by-pass option (p. 3-81), the DEIR states that "Removal of the reservoir sediment in the San Clemente Creek arm would expose the pre-1921 alluvial deposits in the river

FI-4

SED-6

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channel and floodplain through the historic reservoir inundation zone. A three-stage channel would be provided through selective contouring along San Clemente Creek. The channel the same as is described in Section 3.3." However, information about the pre-1921 alluvial deposits is not provided, nor does Section 3.3 provide an adequate description of the channel that would be provided. As a third example, the hazard to steelhead passing over the dam is a salient issue for the assessment of the alternatives (including the preferred alternative), but little information on this point is provided. In sum, the DEIR does not provide the information necessary to make a rational selection among the alternatives, in terms of the long-term effects on steelhead.

SED-6

FI-5

The sediment transport modeling is questionable.

Sediment transport modeling was used to assess various alternatives (p. 4-123). In particular, the option of allowing the river to remove sediments in the notching alternative was rejected based on such modeling (p. 3-47). However, previous work by the engineering consultant used for the EIR, Mussetter Engineering, has been sharply criticized by experts from the United States Geological Survey (Andrews et al. 2002, attached; also available at http://wwwrcamnl.wr.usgs.gov/sws/Trinity/TrinityReview.pdf). The issue in question was this. In December 2000, after years of study, the Secretary of the Interior issued a Record of Decision (ROD) proposing a new flow regime in the Trinity River, downstream from a Bureau of Reclamation dam. On behalf of the Sacramento Municipal Utility District (SMUD), Mussetter Engineering produced a critique of a proposed flow regime, and SMUD used this critique in support of a proposal for an alternative flow regime that would have less impact on hydropower production. Essentially, Mussetter Engineering argued, based on sediment transport modeling, that the flow regime proposed by the ROD would reduce the habitat value of the Trinity River for salmon by flushing out spawning gravels. In 2002, The Bureau of Reclamation asked the United States Geological Survey (USGS) to review the issue. The USGS review, by E. D. Andrews, K. M. Nolan, and S. M. Wiele, can fairly be described as blistering, and contains statements such as "The model results displayed in the upper panel of Figure 40 are physically unreasonable" (p. 7, last paragraph). At the least, this history raises questions about the reliability of the sediment transport modeling used in the EIR. The modeling should be reviewed by independent experts before it is relied on to reject or assess alternatives..

SED-7

The sediment stabilization in the by-pass alternative should be reviewed.

Long-term stabilization of unconsolidated sediments in the historical river channel is a critical element of the by-pass alternative, since failure would deliver large amounts of sediment to the river, with possibly great economic and environmental harm. Either evidence should be provided that the stabilization method proposed is routine and well tested, or the engineering details for such stabilization should be subject to independent expert review before this alternative is selected.

AA-17

The by-pass and removal alternatives will not solve passage problems for steelhead.

The by-pass alternative is imaginative and may provide a feasible means of restoring more or less natural passage for steelhead past the San Clemente site. However, the benefits of such passage are limited by the presence of Los Padres Dam, which lies between San Clemente and most of the prime habitat in the upper watershed. Historically, Los Padres Dam has been a much larger problem for steelhead than San Clemente Dam (Williams 1983), so it is not clear that removing San Clemente Dam will provide much benefit to steelhead. Particularly if public

NEPA/ CEQA 2

NEPA/ CEQA 2

money will be needed for these alternatives, as has been suggested by some, then the benefits to steelhead from improving passage at San Clemente should be compared to the benefits to steelhead from improving passage at Los Padres.

The DEIR embodies an outdated view of steelhead biology:

The DEIR embodies an outdated view of steelhead biology, and takes too narrow a view of the potential consequences of the alternatives. The DEIR could be improved by considering the effects of the proposed project on steelhead in terms of the concepts developed by the National Marine Fisheries Service for recovery of listed "Evolutionarily Significant Units" of salmon, such as the "viable salmonid population concept (McElhany et al. 2000). In particular, the DEIR should take into account that major alterations to the aquatic environment such as those contemplated here, can have evolutionary consequences (Ashley et al. 2003, Stearns and Hendry 2004). For the Carmel River steelhead, factors affecting the selective trade-off between anadromous and resident life history patterns (RSRP 2004) are a particular concern. Mortality during passage over Los Padres Dam seems to be such a factor.

FI-6

The gradient of the sediment in the San Clemente Reservoir may not be at equilibrium.

There is an implicit assumption in the DEIR that the slope of the sediment in the reservoir is at equilibrium. However, this may well not be the case, and this could have important consequences for the notching alternative. As noted in the DEIR, downstream coarsening of the sediment overtime can be expected. As this occurs, the channel gradient will need to steepen to adjust to the resulting greater bed resistance. It would be useful to compare the existing gradient in the reservoir sediments with the channel gradient in geomorphically similar situations farther downstream, such as downstream from Sleepy Hollow. If the final gradient can be expected to be greater than the existing gradient, then the proposal for the notching alternative as presented in the DEIR would remove more sediment than necessary, at unnecessary financial and environmental cost.

SED-8

The DEIR confuses upstream and downstream:

The Draft EIR confuses upstream and downstream in a way that may be a harmless result of careless report preparation, or may be more serious. At p. 4-124, the Draft EIR states that "... for the purpose of comparison, we will assume that about 40 percent of the habitat in the watershed to support juvenile production of YOY and about 60 percent of the habitat to support juvenile production of yearling steelhead occurs *downstream* of Los Padres Dam (Dettman and Kelley 1986)" [emphasis added]. These percentages are repeated further down the page. However, at p. 4-119, Table 4.4-6 shows that these percentages apply to habitat *upstream* from Los Padres. Whether this confusion of upstream and downstream matters depends on whether it occurred before or after the relevant comparisons were done.

FI-7

The DEIR should consider modifications to the notching alternative.

The proposed notch as shown in Figure 3.3-2 is level all the way across. It would seem more sensible to have a notch within the notch, sized to the anticipated active channel of the river, that would tend to hold the thalweg of the stream in one place. This could be placed at the point where fish would be least likely to be injured in passing over the dam. All else equal, the notch should be placed near the fish ladder. The acceleration of water as it nears the inside notch

AA-18

would create a small area of scour upstream from the dam[1], which would reduce the problem of sedimentation near the fish ladder. As noted above, the sediment transport modeling should be reviewed, particularly regarding the option of allowing the river to rework sediments in the notching alternative.

SED-9

The DEIR does not justify removal off as much sediment as is assumed in the notching alternative. For example, it is not clear why sediments could not be left as terraces to one or both sides of the reconstructed channel. Reducing the amount of sediment removed in this alternative would reduce its financial and environmental cost.

SED-10

Consider dredging a channel to the fish ladder, rather than flushing:

For the alternatives that would leave the dam and require a fish ladder, the EIR should consider using a suction dredge rather than flushing to maintain a channel to the ladder. The slurry could be pumped to a settling pond or dewatering facility on the flat next to the dam, and the dewatered sediment could be removed by truck. Dredging would provide greater control over the operation, and minimize the discharge of sediment into the river.

SED-11

The Old Carmel Dam improvements should be considered separately:

It is not clear why improvements to the Old Carmel are part of this project. If these improvements need to be made, they should be made, whether or not anything else is done.

NEPA/ CEQA 3

References:

Ashley, M.V., Wilson, M.F., Pergams, O.R.W., O'Dowd, D.J., Gemde. Scott M., and Brown, J.S. 2003. Evolutionarily enlightened management. Biological Conservation 111: 115-123.

Kondolf, G.M., M.W. Smeltzer, and S. Railsback. 2001. Design and performance of a channel reconstruction project in a coastal California gravel-bed stream. Environmental Management 28(6):761-776.

McElhany, Paul, Rucklelshaus, Mary H., Ford, Michael J., Wainwright, Thomas C., and Bjorkstedt, Eric P. h. 2000. Viable salmonid populations and the recovery of evolutionarily significant units. NOAA Technical Memorandum NMFS-NWFSC-42.

Recovery Science Review Panel (RSRP). 2004. Report of December 1-3, 2004, meeting. NOAA Fisheries, NWFSC. http://www.nwfsc.noaa.gov/trt/rsrp.cfm

Stearns, S.C. and Hendry, A.P. 2004. The salmonid contribution to key issues in evolution. Evolution illuminated: salmon and their relatives. New York, Oxford University Press.

Williams, J. G. 1983. Habitat change in the Carmel River basin. Carmel River Watershed Management Plan Working Paper Number One. Monterey Peninsula Water Management District.

[1] This scour just upstream from the dam is a typical feature of dams that are filled with sediment.

Victoria Kennedy, President of the Sleepy Hollow Homeowners' Association

Re: San Clemente Dam Seismic Safety Project—May 23rd Community Meeting Questions

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TR-4 1) Will any traffic due to this project use any road within the Sleepy Hollow Homeowners' Association boundary?

TR-5 2) Is the Tularcitos Route, the vehicle route that all project vehicles will use?

AA-12 4) Is the proposed batch plant location within 500 feet of two residences?

AA-13 5) Whether or not the plant's location is within 500 feet of two residences, what alternative batch plant sites where analyzed?

V-15 NOI-1 AA-14 6) The preferred batch plant site should be a location that does not cause visual, dust, and noise impacts to any Sleepy Hollow subdivision residents and/or be closer to the dam. What were the limitations to locating the batch plant closer to the dam?

AA-15 7) What is estimated time to complete the project?

AA-16 8) What would be longest expected time to complete the project?

AQ-1 9) What are the actual activities or measures to control dust and noise?

AQ-2 TR-6 10) If there is a problem with project impacts such as noise, start times, dust, traffic control deficiencies, what will be the remedy, besides merely a phone number and person's name to call?

GEN-2 11) What will be the penalty for non-compliance with conditions stated in EIR?

GEN-3 12) Who has the authority to control the site? Only Can Am, a private entity?

GEN-4 13) How are the residents to determine who is the responsible agency, e.g., whether it is Monterey County Zoning Administrator, Monterey Peninsula Water Management District, Monterey County Sheriff's Department, the lead agency Department of Water Resources Department, U.S. Army Corps of Engineers, for each violation of the mitigation measures?

GEN-5 14) As this is privately owned project with the lead CEQA agency's office located in Fresno, who is going to be the local responsible entity to force compliance with mitigation measures or problems with project activities?

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TR-7

15) Who will determine after the project is completed, what and how much repair to Carmel Valley Road or any other public or private roads will occur due to the project's activities?

TR-8

16) Will Monterey County simply accept the traffic impact fee imposed upon the project (equivalent vehicle trips) as satisfying the road repair mitigation measure?

TR-9

17) The EIR/EIS states that there will be flagmen. The document does not state how, when, or where the flagmen will be used. Please provide information as to how, when, and where flagmen will be used. Any place on public roads?

VIS-2

18) Page 2-29, does not state any visual impacts to Sleepy Hollow residents, but the batch plant will be seen by at least the homeowners of two residences in this subdivision. Why isn't the batch plant visual impact addressed in Table 2-1?

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Sleepy Hollow Homeowners Association

Charyce Hatler
Department of Water Resources,
San Joaquin District
3374 East Shields Avenue
Fresno, CA 93726-6913

June 9, 2006

Re: Draft Environmental Impact Statement Report
For the San Clemente Dam Seismic Retrofit Project

Dear Ms. Hatler:

As President of the Sleepy Hollow Homeowners' Association, along with two other Sleepy Hollow Homeowners' Association board members--Sharon Pezzolo and Jim Roberts, I attended the May 23, 2006 public hearing concerning the Draft Environmental Impact Statement Report for the San Clemente Dam Seismic Retrofit Project ("Project"). The panel hearing the testimony requested that I submit my questions that I had orally presented at the public hearing in written form. My questions are attached hereto.

TR-1 Notwithstanding my comments about the Project, the Sleepy Hollow Homeowners' Association is very concerned about the comment made during the hearing that San Clemente Road, the road through Sleepy Hollow, would be used for deliveries and access for construction workers. This type of road use would cause severe negative impacts to our residents through dust, noise, and safety concerns for our children and families that utilize the roadway for residential transportation and recreate on and near the roadway. Many of our homes are situated directly adjacent to the roadway and would incur increased levels of the negative health, quality of life, and safety issues stated above. Please note that this is a gated community and the level of use of the roadway is minimal and the residents are accustomed to this lack of traffic. The type of use contemplated is in violation of our agreement with the dam owner, California American Water Company, regarding their use of the road.

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TR-2 All the alternatives presented to date, would likely require an extraordinary number of vehicles to use San Clemente Road for deliveries and construction worker access. It would also likely require construction vehicles such as concrete trucks to use the roadway and an existing bridge that is not constructed for this frequency or type of use over an extended period of time. The road will very likely prematurely fail and require complete reconstruction during the time frame of construction of the dam work. The use of this road for construction purposes of any kind is totally unacceptable to the Sleepy Hollow residents. Any project alternative must require that all vehicle traffic be prohibited from using Sleepy Hollow roads. Our association is requesting that any proposed dam project would use either the Cachagua Access Route for all construction traffic, or include the construction of the Tularcitos Road access proposed (or equivalent alternate access) in the Draft EIR/EIS for the dam's seismic safety project, to be used for all deliveries and construction worker access.

TR-3 I want to restate that the Sleepy Hollow Homeowners' Association is not against a project to protect the dam from seismic activities, but is emphatically against a project that would put any significant traffic on roads within our subdivision or cause any other significant adverse impacts to the Sleepy Hollow residents.

Sincerely yours,

Victoria Kennedy
President, Sleepy Hollow Homeowners' Association
Attachment: List of Questions Concerning Draft EIR for San Clemente Dam Seismic Safety Project

cc: Sleepy Hollow Homeowners Association Board Members
Anthony Lombardo, Lombardo & Gilles,

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
1111 Jackson Street, Suite 520
Oakland, CA 94607

June 30, 2006

ER# 06/461

Bob Smith
U.S. Army Corps of Engineers
San Francisco District
333 Market Street, 8th Floor
San Francisco, CA 94105-2197

Subject: Review of Draft Environmental Impact Report / Environmental Impact Statement, San Clemente Dam Seismic Safety Project, Monterey County, California (ER 06/0461)

Dear Mr. Smith,

The Department of the Interior (Department), through the Fish and Wildlife Service (Service) in the Ventura Fish and Wildlife Office (VFWO), has participated in planning and development of the Draft Environmental Impact Report / Environmental Impact Statement Review, San Clemente Dam Seismic Safety Project, Monterey County, California (DEIR/EIS) since 2003.

Section 1.1 of the DEIR/EIS characterizes the Service as a cooperating agency in the National Environmental Policy Act planning process (page 1-1, paragraph 2), as provided by Federal regulation at 40 CFR §1501.6. Additionally, on several occasions, the U.S. Army Corps of Engineers (Corps) has verbally expressed an interest in having the Service participate in this capacity.

Therefore, the Service acknowledges and accepts the Corps' request to serve as a cooperating agency in this process. The Department offers the following comments and recommendations to be considered in the Corp's FEIR/EIS.

GENERAL COMMENTS

AL-12

The Department commends the Corps' inclusion of two alternatives (Alternatives 2 and 3) that would return the reach of the Carmel River in the project area to a natural, free-

flowing state. Free-flowing reaches of the Carmel River upstream and downstream of the project area meander seasonally, and periodically create off-channel pools and backwater areas. These features support high-quality breeding habitat for the federally threatened
AL-12 California red-legged frog (Rana aurora draytonii), and the Department finds that returning the project area to a free-flowing state would enable this reach of the Carmel River to eventually function similarly for the subspecies.

The Department has several concerns regarding implementation of the proposed project (i.e., dam thickening).

Specifically, our concerns relate to: fortification of a structure that is likely to pose a barrier to dispersal of individual California red-legged frogs; construction and operation of a concrete batch plant adjacent to the Carmel River where accidental spills and
AL-13 increased sedimentation could have far-reaching adverse effects to aquatic habitats that support the California red-legged frog; construction of a new, redundant access road through an undisturbed riparian area that supports the California red-legged frog; and long-term degradation of habitat for the California red-legged frog.

SPECIFIC COMMENTS

Page 4-19, Section 4.2.1 Environmental Setting - Carmel River Hydrology, first full paragraph, last sentence: Instantaneous peak flows of 16,000 cfs on March 10, 1995, and
HY-12 14,700 cfs on February 3, 1998, - both larger than the 9,000 cfs reported in the document - can be found on the U.S. Geological Survey (USGS) website for the Carmel River at Robles del Rio site at

http://nwis.waterdata.usgs.gov/nwis/peak?site_no=11143200&agency_cd=USGS&format=html

Pages 4-20 and 4-21, Table 4.2-1 Average Monthly Flow: The table provides more significant figures than are found in the original data presented at the USGS website at
HY-13 http://nwis.waterdata.usgs.gov/nwis/monthly/?site_no=11143200&agency_cd=USGS - thereby implying greater precision than the data actually have (USGS presents only three significant figures below 1,000 cfs; table 4.2.1 presents as many as five).

Pages 4-22 and 4-23, Table 4.2-2 Peak Monthly Flow for Period of Record: The table title is ambiguous - apparently what is reported is the highest daily mean flow for each month - distinguished from the instantaneous peak flow referenced in our first comment.
HY-14

More information about USGS surface water data in California can be obtained from Donna Schiffer, Chief, Statewide Hydrologic Monitoring and Information Office, USGS Water Science Center at (916) 278-3097 or shiffer@usgs.gov.

Page 4-173, Paragraph 4: The DEIR/EIS indicates that habitat loss is not a threat to
TE-18 California red-legged frog populations in central California. We respectfully disagree with this assertion. The recovery plan for the subspecies (Service 2002) refers to habitat

TE-18 loss and alteration as primary factors that have negatively affected the subspecies throughout its range.

TE-19 Page 4-174, Paragraph 1: The discussion of interactions between California red-legged frogs and bullfrogs (Rana catesbeiana) presented in the DEIR/EIS is not accurate in the context of the proposed project area. The Barry (1999) reference cited in the DEIR/EIS relates to Butte County, which is at least 200 miles from the project area and is not along the California coast.

TE-20 The Department is unaware of any locations in or near Monterey County where "California red-legged frogs and bullfrogs co-occur in stable relative numbers," as stated in the DEIR/EIS (Page 4-174, paragraph 1).

TE-21 California red-legged frogs and bullfrogs have never been documented to co-occur in stable relative numbers in the Carmel River watershed, and proliferation of bullfrog populations along the central California coast (e.g., Monterey County) are a substantial threat to the persistence of the California red-legged frog in this area.

TE-22 California red-legged frogs have been found on many occasions in the stomachs of bullfrogs that were collected in the project area.

TE-23 The DEIR/EIS states "Surveys during the annual San Clemente Reservoir drawdowns found California red-legged frogs and bullfrogs co-occurring throughout San Clemente Reservoir" (page 4-174, paragraph 1).

TE-24 According to survey data submitted to the Service, the number of bullfrogs detected in San Clemente Reservoir, over the referenced time period, has increased dramatically, while the number of California red-legged frogs detected by surveyors has substantially declined. These trends indicate that bullfrogs are gradually out-competing and displacing California red-legged frogs from San Clemente Reservoir.

TE-25 Page 4-174, Paragraph 4: The DEIR/EIS states "pond habitat within the Carmel River arm occurs up to the upstream end of the reservoir sediment bed, but spawning pools outside of the river channel are absent further upstream" (page 4-174, paragraph 4). However, systematic annual California red-legged frog surveys conducted between 2002 and 2006 have consistently documented California red-legged frog reproduction in side-channel and off-channel pools up to 1.5 miles upstream of San Clemente Reservoir.

TE-26 Pages 4-174 and 4-175: The DEIR/EIS uses 1997 survey data to support the conclusion of absence of California red-legged frogs from several reaches of the Carmel River in the project area (e.g., page 4-174, paragraph 3; page 4-174, paragraph 5; page 4-175, paragraph 1).

TE-27 The 1997 survey data is outdated; please include updated information in the final EIR/EIS. For example, the DEIR/EIS states that no California red-legged frogs were found in lower Tularcitos Creek during surveys in 1997 (Page 4-175; paragraph 1).

TE-27 However, an adult California red-legged frog was observed in Tularcitos Creek downstream of San Clemente Drive in 2000.

Page 4-188: In its evaluation of effects of each alternative on wildlife species, the DEIR/EIS does not identify effects of the proposed project (i.e., dam thickening) on movement and dispersal of California red-legged frogs from upstream and downstream of the project area.

Please include the following information in the FEIR/EIS.

Dispersal of individual California red-legged frogs plays an important role in metapopulation dynamics and therefore, the persistence of populations. While California red-legged frogs can pass many obstacles, and do not require a particular type of habitat for dispersal, a potential dispersal route connecting aquatic habitat sites must be free of barriers (i.e., a physical or biological features that prevents frogs from dispersing beyond the feature) and of sufficient width.

California red-legged frogs spend considerable time resting and feeding in riparian and wetland vegetation when it is present. Most of the time, when they are not in the water or making overland excursions, individual California red-legged frogs can be found within two or three hops of the water, resting secretively and feeding on land underneath a canopy provided by herbaceous plants and a variety of moisture-loving softwoods such as willows.

TE-28 Therefore, it is reasonable to conclude that moisture and cover provided by the riparian plant community provide suitable foraging habitat and may facilitate dispersal.

Designating or creating movement corridors for California red-legged frogs is problematic. However, when an obvious corridor exists between two occupied sites, California red-legged frogs are likely to use the route (Bulger et. al 2003). An example of such an obvious corridor is the riparian zone along the Carmel River upstream and downstream of the San Clemente Dam.

For a species such as the California red-legged frog to disperse beyond the San Clemente Dam (i.e., upstream or downstream), an individual must ascend or descend extremely steep slopes on either river bank adjacent to either dam abutment. Even in the unlikely event that an individual California red-legged frog is able to negotiate this slope, its exposure to predation is greatly increased during this movement.

Although dispersal of individual California red-legged frogs in the project area has not been rigorously studied, it is reasonable to conclude that a structure such as the San Clemente Dam poses a substantial barrier to dispersal. If the dam is stabilized and reinforced in place as described in the

TE-28 proposed project in the DEIR/EIS, it is very likely that the dam will perpetually remain an obstacle to dispersing California red-legged frogs.

Page 4-197: In its analysis of effects of constructing and operating the concrete batch plant, the DEIR/EIS does not recognize any potential impacts to the California red-legged frog. However, California red-legged frogs are known to occur in the Carmel River immediately adjacent to the proposed site for the concrete batch plant.

California red-legged frogs could be directly and indirectly impacted by construction and use of a concrete batch plant in this location. Constructing the concrete plant could result
TE-29 in destruction of upland habitat for the California red-legged frog, and any inadvertent spill of materials could lead to contamination of the Carmel River downstream of the project area.

By choosing a different location of the concrete batch plant, or selecting an alternative that does not necessitate use of a concrete batch plant, the likelihood of these adverse effects on the California red-legged frog and its habitat could be reduced or eliminated.

Pages 4-197 through 4-199: In its analysis of effects of creating the new Tularcitos Access Road, the DEIR/EIS does not recognize any potential impacts to the California red-legged frog. However, California red-legged frogs are known to occur in Tularcitos Creek and the Carmel River in the vicinity of the proposed new road alignment.

California red-legged frogs could be directly and indirectly impacted by construction, use, and existence of this new, permanent access road. Constructing this new access road would result in destruction of aquatic and upland habitat, alteration of Tularcitos Creek
TE-30 and Carmel River floodplains, and increased sedimentation of Tularcitos Creek and Carmel River downstream of the project area.

Tularcitos Creek is already known to be a primary contributor of sediment to the Carmel River. Construction in the riparian corridor and floodplain of Tularcitos Creek would likely increase its contribution of sediment to the Carmel River. This increased sediment load could, in turn, further degrade habitat for the California red-legged frog downstream of the project area. By using the existing paved access road (San Clemente Drive), which is owned by Cal-Am, the likelihood of these adverse effects on the California red-legged frog and its habitat could be reduced or eliminated.

Page 4-199: The DEIR/EIS concludes that maintaining the San Clemente Reservoir pool at an elevation of 525 feet would be beneficial to the California red-legged frog. However, as noted previously, biologists have documented a steep decline in the number of California red-legged frogs and a sharp increase in the population of bullfrogs while
TE-31 the reservoir has been maintained at this elevation since 2003.

As long as San Clemente Reservoir provides breeding habitat for bullfrogs, increased numbers of bullfrogs at this site and dispersal of the juvenile bullfrogs produced here pose a considerable threat to California red-legged frogs.

Emigration of bullfrogs from San Clemente Reservoir to aquatic habitat surrounding the reservoir is likely resulting in large numbers of bullfrogs encroaching on aquatic habitats that formerly supported a larger proportion of California red-legged frogs.

The thousands of bullfrogs reproducing at, and dispersing from, San Clemente Reservoir likely out-compete, displace, and predate California red-legged frogs within and near the project area. Therefore, if the reservoir would be allowed to remain in place, substantial efforts to eradicate bullfrogs from the project area will be necessary to minimize these adverse impacts to the California red-legged frog population in the area.

TE-31

Without permanently ponded water, bullfrog reproduction is severely impaired. Therefore, elimination of the reservoir (e.g., through the dam removal alternative or the dam removal and river reroute alternative) would remove breeding habitat for bullfrogs. In addition, returning the reach of the Carmel River in the project area to a free-flowing state would allow the river to seasonally create off-channel breeding habitat for California red-legged frogs in this area while reducing the likelihood of re-establishment of bullfrog reproduction.

The Department supports the Corps' commitment to designing future monitoring and enhancement efforts to minimize impacts of the San Clemente Dam Seismic Safety Project on the California red-legged frog. We recommend that control and monitoring of non-native predators (e.g., bullfrogs, crayfish (Pacifasticus leniusculus), and centrarchid fishes) be emphasized in the final EIR/EIS, in order to minimize adverse impacts of the project on California red-legged frogs and other aquatic species.

TE-32

In conclusion, we appreciate the opportunity to provide these comments. If you need further assistance, please contact Roger Root of the VFWO at (805) 644-1766 or Lloyd Woosley, Chief of the USGS Environmental Affairs Program, at (703) 648-5028 or at lwoosley@usgs.gov.

Sincerely,

Patricia Sanderson Port
Regional Environmental Officer

cc: OEPC, HQ,
FWS, Portland, OR
USGS, HQ

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Thayer

June 22, 2006

Ms. Paula Landis, Chief
California Department of Water Resources
San Joaquin District
3374 E. Shields Ave., Room A7
Fresno, CA 93726

Mr. Robert Smith, Project Manager
United States Army Corps of Engineers
San Francisco District
3333 Market St.
San Francisco CA 94106

Dear Ms. Landis and Mr. Smith: Regarding: San Clemente Dam draft EIR.
Dam safety retrofit or dam removal.

For 6 years or more, the dam has been reported so unsafe that it could collapse in case of a large, prolonged rainfall or in case of a sizable earthquake. There are persistent rumors of toxics or hazardous materials behind the dam, yet Mr. John Klein, engineer with Cal Am Water Co. tells me that he knows of no testing or core samples taken of the sediments, mud and silt behind the dam.

There are hundreds of thousands of cubic yards of sediments behind the dam which have been in place, unmoved for 30, 50 and even 85 years. Toxics could be concentrated. If the alternatives to either notch the dam or demolish and remove it are chosen, sediments will be moved with shovels and bulldozers and will be greatly disturbed and dislocated. Any potential toxics could escape into the Carmel River channel and affect the Cal Am water supply as well as riverbed and ponds, wetlands and the Lagoon which the river creates.

WQ-2

The greatest disturbance would occur if the dam is removed. The plan is to re-channel the River into the San Clemente Creek channel. The portion of this channel which is also behind the dam is filled with sediments similar to those in the adjacent Carmel River channel behind the dam. They potentially could contain similar toxics and if they do, the toxics could also wash down the Carmel River channel, harming the watershed down the channel.

I'd like to request that core samples of the sediments of the River and Creek channels behind the dam be made to ascertain whether there are toxics, of what type and quantity, and what risk they might pose to the Carmel River channel downstream and the drinking water supply, under each possible alternative for dam safety retrofit or removal.

FI-41

The best alternative for the retrofit or dam removal project is that which is sensitive to the steelhead fish runs and the total flora and fauna of this Carmel River Watershed - - - one of the jewels of the entire state of California. If the expense is more for the dam project

FI-41 which leads to the best restoration (and continuation) of this fine watershed, interagency plans and cooperation are well justified to make the larger project possible.

CR-4 Mindful of Cal Am's obligations to safety-retrofit or demolish the dam, when RWE bought Cal Am, they certainly did their due diligence, and knew full well of the dam's structural problems. The estimated costs of dam safety work were surely subtracted from the price RWE offered Cal Am, and therefore the costs should be borne by Cal Am and RWE, and not by the ratepayers.

Thank you for your consideration and thank you for diligently seeing this project through. The San Clemente dam is taunting us to neglect it and postpone the safety project until the next big rains or the next sizable quake.

Sincerely yours

David Zaches
25430 Via Mariquita
Carmel, CA 93923
831/ 626-4200

Appendix D

TRANSCRIPT OF PUBLIC HEARING ON DRAFT EIR/EIS

PUBLIC HEARING

RE: SAN CLEMENTE DAM SEISMIC SAFETY PROJECT

RANCHO CANADA GOLF COURSE
4860 CARMEL VALLEY ROAD
CARMEL VALLEY, CALIFORNIA

6:30 - 8:30 P.M.
TUESDAY, MAY 23, 2006

JEREMY PRATT: So with that, Jane, if you'd like to call the public hearing formally to order?

JANE HICKS: Thanks, Jeremy.

The purpose of this hearing is to acquire information or evidence which will be considered in evaluating a request by the California American Water Company for a Department of the Army permit to discharge fill into waters of the United States to construct the San Clemente Dam Seismic Safety Project.

This permit application is being evaluated pursuant to Section 404 of the Clean Water Act. This hearing affords you, the public, the opportunity to present your views, opinions and information on the proposed project. I now call the public hearing to order.

JEREMY PRATT: The first name on the list is Jonas Minton. And I will call two names at once so people can come to both microphones. After Jonas will be William Look.

JONAS MINTON: Good evening. I'm Jonas Minton with the Planning and Conservation League Environmental Advocacy Organization.

I want to thank you all for having this meeting and for going back, not just looking at the alternatives that were looked at in 1998, in the year 2000. As you

pointed out, there are significant issues that make almost any solution impossible.

There are a few impacts that we think have not yet been addressed. The first is some of the problems with the dam strengthening and notching that we don't think are fully evaluated, and that includes the potential for sediment scour from the silted-in reservoir in a high-flow event, and that could mobilize; that is to say, carry down a lot of sediment to the downstream areas impacting both fish and residents.

SED-58

Secondly, we think that additional attention needs to be placed on the difficulties of sluicing from either the dam strengthening alternative or the notching alternative. How do you sluice at the same time you maintain fish passage? The time that you want to sluice is when the fish want to out migrate.

SED-59
FI-102

A major unacknowledged problem is the -- or, pardon me, acknowledged problem with the dam strengthening and notching as identified on page 51 is, quote, significant and unavoidable impacts to water quality, significant and unavoidable impacts to fish. Those are impacts with both the strengthening and the notching.

AL-15

For those reasons, it appears to us that the viable alternative is the river rerouting and dam

removal option, and it is our view after reading the entire EIR/EIS that that is in fact the least environmentally damaging project alternative, which the Corps, of course, is required to identify under Section 404(b)(1) of the Clean Water Act.

BOB SMITH: One minute.

AL-15

JONAS MINTON: And we also believe that that is the most environmentally, economically and socially response alternative. Instead of dealing with this as a problem that has to be cemented in or hacked half way down, we think that it's possible to have a bigger solution.

The Planning and Conservation League is also sponsoring two workshops June 5th here in Carmel to look at -- for the community to look at our draft watershed restoration program that looks at both the dam removal and other improvements to the watershed. Thank you.

JEREMY PRATT: William Look. And the next after William will be Charles Franklin.

WILLIAM LOOK: Hello. My name is William Look; I am here on behalf of California Trial tonight. California Trial does not have a position yet on which alternative they would favor. However, in reading the -- and I was handed a playbook just a couple of days ago, so I'm playing a little bit of catch up here, but

it appeared to me that looking at the river holistically, some attention ought to be made to recharging downstream gravels, and also to the ongoing problem that if the -- of addressing the problems of the fish barrier and the alternatives which do not entail removal of the dam.

SED-60

Based on what I've seen so far, however, it seems to me that as long as the entombment of the gravel can be done in a way which provides a long-term solution and not one that just defers 50 or 60 years --

BOB SMITH: One minute.

WILLIAM LOOK: -- and that might be the preferred alternative in that it provides probably the least risk to the public and least disruption of the homes in the area as well as provides what in the end would be a more natural fish passage, so long as in the end you haven't created yet another barrier where the dam was.

AL-16

JEREMY PRATT: Thank you, William. Charles Franklin, followed by Hannah Schoenthal-Muse.

CHARLES FRANKLIN: My name is Charlie Franklin, and I live on the river about four or five miles down below the dam, so I'm concerned because you are messing around with my backyard.

The concept of extending the term of the

project to mitigate its impacts, it's a century of accumulation, roughly, and shouldn't we try and mitigate it on that kind of time scale? Does that make any sense economically? I don't know. But I didn't quite get why this four- or five-year time span seemed necessary for the project. So you could do it over a hundred years very differently and probably pick up most of the seismic mitigation in the first five years.

GEN-23

Anyway, a question. I didn't see it addressed. It's probably in here. Is there someone here who could tell me how the condition of the existing reinforcing steel was assessed?

AA-50

JEREMY PRATT: What we plan to do, Charlie, is address all the questions and comments in response to the formal response that is the final EIR/EIS.

CHARLES FRANKLIN: Okay. How large a head pressure source does Cal Am need to keep up and maintain the system? Is there going to be some permanent residual water retention object up there?

AA-51

BOB SMITH: One minute.

CHARLES FRANKLIN: What?

BOB SMITH: You've got one minute.

CHARLES FRANKLIN: Okay. That's good. I've got one last question.

The prior speaker raised the question of what

SED-61

SED-61

are the appropriate compensatory sediment flows. I mean you have been stealing gravel out of my backyard for a hundred years. Over how long a period of time, how much gravel should you be giving me back to kind of put us back to where we were a hundred years ago? Thank you.

JEREMY PRATT: Thank you, Charlie. And Hannah, and following Hannah would be Roger Williams.

HANNAH SCHOENTHAL-MUSE: Hi, my name is Hannah Schoenthal-Muse, and I'm with Friends of the River, and thanks for having us today.

AL-17

Straight to the point. We think that the reroute and dam removal alternative is the most appropriate option of all. Not only will it help improve the overall health of the Carmel River, we think it will protect the viability of California's important coastal steelhead stream. So that's where we stand, and thanks for having us.

JEREMY PRATT: Thanks, Hannah. I apologize for mispronouncing your name.

HANNAH SCHOENTHAL-MUSE: That's okay.

JEREMY PRATT: And we have Roger Williams and Roy Kam --

ROY KAMINSKI: Kaminski.

JEREMY PRATT: Thank you.

ROY KAMINSKI: Come in or go out and put a ski

on the end of it.

ROGER WILLIAMS: I am Roger Williams. I'm a Carmel-by-the-Sea resident. And I like the last alternative. I was really impressed with the idea of the river rerouting. The strengthening and notching of the dam don't do anything for the steelhead, or not much other than improving the fish ladder. Yet the notching has the advantage of doing a whole lot of good for at least that population of the wild life.

AL-18

But I would like to mention one other issue, and the issue is dams over the years in California have trapped sediment, which has had a negative impact on beaches. Many of the beaches up and down the state are diminishing. So I think if the bypass route is used, rather than entombing the sediment forever, a slow impact, as the previous speaker was talking about, over a hundred years of releasing some of that trapped sediment every year during the winter state would help reestablish some of the beaches.

SED-62

NEPA/ CEQA -31

JEREMY PRATT: Thanks, Roger. And Roy, followed by Robert Greenwood.

ROY KAMINSKI: Thank you. It seems to me that the dam serves a purpose with head and it also serves a purpose of having water available in case we have a major fire catastrophe. So I should think that having

WAT-15

WAT-9

water in a location, maybe only 50 or 100 acre feet, would be of some service.

And I'm just wondering if it's feasible to notch the dam a little more, lower the water level, and then put a conduit, maybe a 20-foot conduit, like run under the Thames River 200 years ago, you've gone under

AA-52

the English Channel, put in a 20-foot conduit into the middle of it or the base of it, and then you can drain it, and then you can drain the sediment. And seems to me you would have a free flow, and that probably would eliminate the need for a desal plant in Moss Landing. If we had the river running 24 hours a day, 7 days a

WAT-10

week, 365 days a year, I think that might solve our water problem.

And, too, what you might do is consider a dam, a water -- a rubber dam or some balloons, maybe only three feet, just to keep water flowing the year round. And then when the flows -- when it flows, then you can turn down the dam. But I'm thinking that it may be a

AA-53

feasible option to notch it, lower the water level, and then drill into, maybe the center, maybe close to the base. Then that takes all of that sediment out of there or takes all of the water out of there, takes all of the weight that's pushing up against the dam now, and you may not have to do anything else. Thank you.

JEREMY PRATT: Thanks, Roy. And then we have Robert Greenwood followed by Don --

DON REDGWICK: Redgwick.

JEREMY PRATT: Thank you.

ROBERT GREENWOOD: Did you say Robert Greenwood?

JEREMY PRATT: Yes, I did.

ROBERT GREENWOOD: I'm Robert Greenwood speaking for Carmel Valley Association, and I really have a question. I have only read the summary, and the summary explains what will be done with the sediment, but the alternatives for dam removal don't say what will be done with the concrete. That seems to me a big issue that ought to be at least discussed. I don't know whether you have any answer tonight, but if you do, it would be helpful.

AA-54

JEREMY PRATT: We will address all the questions in the final EIR/EIS.

ROBERT GREENWOOD: I didn't see anything about that in the summary.

JEREMY PRATT: It is contained in chapter three, but thanks for bringing that up, maybe we should put it in the summary.

So then we have Don and Claire -- Cliff -- Clive Sanders.

DON REDGWICK: My name's is Don Redgwick from Pacific Grove. I wrote my comments down before I knew about this alternative of the river rerouting, but I think some of these things could tie in with that particular plan.

I think the report and recommendation should take into consideration the environment, preservation, conservation, water resources and economics of the project. The solution to all five of these goals is to save the existing dam by reinforcing. The sediment should be moved from the back of the dam to the front of the dam and placed as a buttress. I think that follows a little bit with your wasting the sediment in the old channel line.

AL-19

The buttress should be large enough to allow the sediment to dry to about five percent of optimum in order to be able to secure reasonable compaction. And the material, there should be some kind of capping of the sediment for erosion control, and that would be true whether you reroute the river or not to get that sediment out. I don't know the nature of the sediment, but I imagine it's pretty erodable.

AA-55

The demolition of the dam and the removal of the sedimentation will have a severe impact on Carmel Valley Road unless the broken concrete and steel are

AA-56

buried on-site, and the sediment can't be placed somewhere else in the vicinity of the dam. The rerouting of the Carmel River will not cause the sediment to be stable and now to resist water runoff from the surrounding hills without some means of stabilization. The dam can serve many functions if left in place and strengthened. It can be --

BOB SMITH: One minute. You have one minute.

DON REDGWICK: It can be managed to serve as a flood control protection which allow -- which would allow protection of the Carmel River basin if there is an allowance for storage during a storm. In other words, you have to keep the level down. A dam will support wild life and migrating birds. Water storage can offset the use of energy used to produce water by reverse osmosis. Demolition of the dam will result in a very costly cost to the taxpayers or the consumers, and it probably might involve some court costs along with it without a reasonable solution. Thank you.

My comments are kind of real screwed up. I will leave them anyway.

JEREMY PRATT: Thanks, Don. So you're turning in your written comments? Okay.

Clive or Cliff, I apologize. I'm sure I'm butchering some of your names. And followed by Hank

AA-56

AA-57

GEN-24

CR-1

Smith.

CLIVE SANDERS: My name is Clive Sanders; I'm with the Carmel River Watershed Conservancy.

Having spent the last 15 years reading through your consulting efforts, I felt that I understood everything until I started looking at the next or the last 502 pages. It seems to me that we have forgotten one of the more basic things, and that is the economics of what we're doing and why we're doing it.

And I think one of the things that's left out of this study -- and I think you have done a great job of pointing out all the problems. I mean we have got 15 items here on the impacts in mitigation, many of which refer to each one of these different ways of doing things. And I realize you can't do much more than point them out. The only trouble is you are talking to people who don't understand, at least I certainly don't understand, half the things that could happen that you haven't even mentioned.

And, therefore, I think the only alternative you are giving us is movement, the changing of the route of the Carmel River. Now I'm a guy who has been against putting a dam down all these 15 years. I have become educated with the help of a few friends, and I think that's the way to go.

AL-20

I think we need to understand a little bit better that the cost of this cannot be borne by the owner. Now the owner happens to be Cal Am, but the people who are paying for it are we. We are the people that are going to be paying for it. If we're going to have a major demolition of the dam at the level you are suggesting, then we need federal help.

CR-7

Now I believe there are groups of people that are working on this. I think this has to be published, and I think in your final report you need to zero in on this aspect. Thank you.

JEREMY PRATT: Thank you, Clive. Hank Smith followed by David Zaches.

HANK SMITH: Hi, I'm Hank Smith, a resident of Monterey. I would like to offer my thanks to all the participants for coming up with these thoughtful options for us, and it obviously reflects a lot of hard work and time on your part.

I support alternative number 3 for the following reasons. The dam no longer fulfills its intended, original purpose because of the sediment behind it. The disruption and costs of silt removal -- removal are obviously not acceptable. Spending money to buttress a worthless water storage tool escapes my notion of common sense.

AL-21

Lastly, but most importantly, alternatives other than dam removal will have a negative impact on the fish. And the ladder is not only ineffective, but even the best fish ladders -- and not many people are aware of this, but even the best fish ladders only allow 50 to 80 percent of the fish to migrate upstream. So even if we upgrade this fish ladder, we're still not really doing justice to the fish. Upgrading and ongoing care and maintenance of the fish ladder in these other alternatives will be very significant and will be borne by you and me for decades to come.

FI-103

The notching alternative bothers me because it was not clear how the fish are going to out migrate. You know, these fish are returned back, if they can. They return back to the sea and they do this several times. But the notching doesn't describe how they are going to make that journey. And we already have experienced situations on the existing dams where the water flow is such that these fish trying to make their out migration; that is, to return back to the ocean --

FI-104

BOB SMITH: One minute.

HANK SMITH: -- are destroyed. So thank you very much.

JEREMY PRATT: Thank you, Hank. And so Dave and then Frank Emerson.

DAVE ZACHES: My name is Dave Zaches; I live in Carmel Valley. I am interested in following some of the comments which I thought were brilliant.

Regarding the fish, the more care and attention we give to this fish run. I think the better. However, there was a healthy fish run here 50, 60 years ago in spite of the dam. So whether we really need to demolish the dam in order to improve the fish runs, I do not know.

FI-105

The other thing is the toxics, the pollutants, the chemicals which have been inserted into the Carmel River area behind the dam, below the dam. We're all drinking that water. And I haven't heard anyone really address to my satisfaction, and I can't understand what's in the report frankly. It's very, very complex, and I don't know whether one part per million is okay or one part per billion is okay. But I hope a lot of attention will be given to that in the rerouting of the river way or the, you know, so-called encapsulation or trapping of the sediments and the toxics and pollutants. When that river gets to flowing, it rolls big boulders down the stream. It's a very powerful force. So I hope that whichever alternative comes up, it will consider that.

WQ-9

And the other one, I think if the river is

WAT-11

WAT-11

rerouted, why don't we have some sort of a water storage there, even a small one, as the gentleman in the red jacket suggested, for --

BOB SMITH: One minute.

DAVE ZACHES: -- wild life, fish, et cetera, et cetera. Thank you.

JEREMY PRATT: Thanks, Frank. And before -- or, Dave. And I apologize for mispronouncing your last name. But before Frank speaks, let me just say we're getting down to the bottom third of our list, and if anyone has been inspired, sitting here, to want to comment -- Glenna, if you would come up and get the extra sheets, feel free to sign up now.

So we have Frank Emerson followed by Victoria Kennedy.

FRANK EMERSON: Yes. Thank you. My name is Frank Emerson; I am a volunteer with the Carmel River Steelhead Association. I coordinate fish rescues. I'm a resident of Monterey, so we're a stakeholder of record. I would like to also thank you for your presentations. I thought they were very informative. In a short amount of time you've really addressed a lot of the issues. I know it is very complex.

AL-22

And what became obvious to me, it was that the one thing that really stands out for me is the first two

options, the strengthening and the notching only solved one of a number of problems, and that is simply the dam safety issue. Neither option provides any more water storage, actually both do not provide any water storage, as well as flood control. So even as Dave was pointing out, if those dams were restored back to their original condition, they still won't provide flood control because they don't store enough water. They quickly fill up and water passes over them.

AL-22

So to me the biggest bang for the buck is the reroute and removal options, because it addresses not only the dam safety issue, but it restores a critically important reach of spawning habitat. It restores the ability of fish to pass freely, downstream migration of juvenile fish, adult fish, upstream migration of adult fish, restores an area to its previous condition. Dave was saying something like two miles of that river has now been inundated by sediment, so that's two miles of riverbed that could be restored.

And I really appreciated Mr. Williams' comment that over time we could recycle that cobble, because gravel injection is one of the mitigations suggested by the fisheries agencies. So there is more and more benefits obviously apparent than that option to me.

SED-64

And I'd also like to take the opportunity to

say that we have an historic opportunity not usually seen in California. And if there was ever a dam that was crying out to be removed, it's the San Clemente Dam. It provides so little benefit and actually remains a hazard, remains a public nuisance --

AL-22

BOB SMITH: One minute.

FRANK EMERSON: -- if we go with Option 1 or 2.

So, again, thank you for all the hard work you did on the presentations, and we'd like to be on record as supporting Option 4. Thank you.

JEREMY PRATT: Thanks, Frank. Victoria Kennedy and then Nancy Pratt.

VICTORIA KENNEDY: Hi, I'm Victoria Kennedy; president of the Sleepy Hollow Homeowners Association. And since it appears as if all the alternatives affect our community, particularly with traffic but also with dust and noise, I would like the following questions addressed in the final EIR.

TR-13

The first is regarding all the alternatives. Why can't you use the Tularcitos route for all of them?

TR-14

You have mentioned tonight that there's going to be deliveries and construction workers using the Sleepy Hollow access, and I would like to know how many construction workers a day we're talking about, and how many deliveries approximately? And why can't you use

TR-14

the Tularcitos route for these and not Sleepy Hollow?

The other questions are: Is the proposed batch plant location for the dam strengthening within 500 feet of any of the Sleepy Hollow residences? And whether or not the plant's location is within 500 feet of the residences, which alternative batch plant sites were

AA-58

analyzed? The preferred batch plant site would be a location that does not cause visual, dust and noise impacts to any Sleepy Hollow subdivision residents and be close to them. What are the limitations to locating the batch plant closer to the dam? What's the longest expected time to complete any of these projects? I know

AA-59

you have approximate times, but what's the longest time?

AQ-13
NOI-3

What are the actual activities or measures to control dust and noise? If there's a problem with project impacts such as noise, start times, dust, traffic

GEN-25

control deficiencies, what will be the remedy besides merely a phone number and a person's name to call? What would be the penalty for noncompliance with conditions

GEN-26

stated in the EIR? What has the authority -- who has the authority to control the site? Only Cal Am, a

GEN-27

private entity, or a non-private entity?

Do the residents have the figure -- have to figure who is responsible -- the responsible agency,

GEN-28

whether it is a Monterey County zoning administrator or

GEN-28

the water management district or the county sheriff's department?

GEN-29

As this is a privately-owned project with CEQA agency's office located in Fresno, who is going to be the local responsible entity to force compliance with mitigation measures or problems with project activities? Who will determine after the project is completed what and how much repair to Carmel Valley Road or any other

TR-15

public or private roads will occur due to the project's activities?

TR-16

Will Monterey County simply accept this traffic impact fee imposed upon the project, the equivalent vehicle traps as satisfying the road repair mitigation measure?

TR-17

And the EIR/EIS states that there will be flagmen. The document does not state how, when or where the flagmen will be used. Can you please provide information as to how, when and where the flagmen will be used --

BOB SMITH: One minute.

VICTORIA KENNEDY: -- any place on the public roads?

VIS-7

And my last question is on page 2/29. It does not state any visual impacts to Sleepy Hollow residents, but the batch plant will be seen by at least the

VIS-7

homeowners of two residences in the subdivision. Why isn't the batch plant visual impact addressed in Table 2-1? And that's it. Thank you very much for your time.

JEREMY PRATT: Thank you, Victoria. You are certainly going to keep us busy in the final. Victoria, you have those in writing, if we could get a copy of those.

VICTORIA KENNEDY: I will do that because I have them.

JEREMY PRATT: Thank you. And next is Nancy Pratt followed by Monica Hunter.

NANCY PRATT: And I would like to donate my name to David Dillworth with HOPE, Helping our Peninsulas and Environment, if he appears.

JEREMY PRATT: If he appears. All right. He hasn't signed up yet, Nancy. But I do like your last name.

NANCY PRATT: Yes.

JEREMY PRATT: Monica Hunter and Rex Keyes.

MONICA HUNTER: Thank you. My name is Monica Hunter; I'm with the Planning and Conservation League Foundation. I'm also a board member of the Carmel River Watershed Conservancy. And while I'm not here to speak for the board this evening, I do want to bring up an element of this that hasn't been touched on tonight, and

GEN-30

it represents the work of the conservancy and that is in establishing a watershed management plan and implementing a watershed-wide approach to understanding the issues and challenges of protecting water quality, riparian habitat, river channel systems, and also the linkages to the lagoon and to the beach and some of the issues that are occurring there.

I also want to mention that Carmel River watershed is a critical coastal watershed. And most of us are aware that within the state we have put tremendous effort and emphasis on a number of our programs, funding included, resources, technical

GEN-30

expertise devoted to understanding how we can improve and protect the coastal watersheds. And this concerns impact to near-shore marine environments as well as protecting water quality for the benefit of communities; in this case, this community does rely on the Carmel River for many recreational and other local traditional uses.

So I think the watershed context is something that we can't overlook. I think removing the dam structure of stabilizing the sediment, rerouting the river, restoring the flow of the river is something that in the long run the watershed management effort would most benefit from that. I think it would solve many

problems and eliminate some of the costly bandaids that we're looking at in terms of trying to overcome the ongoing and permanent impacts as long as that structure remains in place. Thank you.

GEN-30

JEREMY PRATT: Thank you, Monica. Rex Keyes and Steve Wilpert.

REX KEYES: Hi, I'm Rex Keyes; I'm from Salinas, and I'm in favor of restoring the dam to its original operation like it was about 50 years ago.

AL-23

And my suggestion is gradual release of the sediment behind the dam. You can do that during a trial period, like this next winter. Release some of the sediment during high flow rates, which should deposit evenly downstream all the way to the ocean. And in the last 20 years we've had a lot of heavy rains. You've had a lot of sediment coming down, minor landslides occurring in the Carmel River, and this probably wouldn't be any more harmful than what occurs naturally.

SED-64

At the end of the winter you could measure the impacts and, if it's pretty successful, each year afterwards release more and more sediment until the dam is restored to what its normal operations used to be. I don't think we had a dam built in California in the last 50 years and having this increased water supply to the Monterey Peninsula would be a great value. Thank you.

WAT-12

JEREMY PRATT: Thanks, Rex. And Steven Wilpert?

STEVEN WILPERT: Hi, I'm Steve Wilpert; I live in Sleepy Hollow. I'm not speaking on behalf of Sleepy Hollow. In fact, I just joined this project in terms of being aware of it two years ago, so I'm not as well versed as a lot of the speakers tonight.

But I must say that I'm still amazed and I'm still scratching my head, because I still don't get it. I still don't get what the purpose of the project is. I see up on the board a very nice presentation, a dam safety project. I'm for dam safety. I'm for people not getting hurt during a hundred-year flow. I'm for people not getting hurt during a maximum credible earthquake. I'm for people not getting hurt when any dam might contribute to damage to peoples' property or people themselves.

SA-2

But I haven't seen anything or heard anything to suggest that the harm that this community is going to experience after a hundred-year storm event and after a maximum credible earthquake is going to be exacerbated by that old dam failing. I just don't get it.

I like the people at Camp Stephanie. I don't dislike them. I don't dislike anybody that lives along the Carmel River. But I just -- I just don't get it why

we're talking about spending so much money for such a little impact relative to the destruction we're going to have around us from such a huge flow of water and such a large earthquake.

SA-2

We're spending our tax dollars; that is, Cal Am is spending its energy. I suggest leave them alone. And Cal Am is being forced to spend their customers' money a hell of a lot on a project that means so little in terms of the whole community. Thank you.

CR-8

JEREMY PRATT: Thanks, Steve.

Are there more sign-ups? Great.

Anyone who still feels inspired, please.

ROY THOMAS: I am inspired, and you passed me up, so I am the other Roy in the Roy -- I'm Roy Thomas.

JEREMY PRATT: Roy, I'm sorry.

ROY THOMAS: That's all right. I thought you were saving the best till last. That's happened before.

I'd like to remind you of some problems with dealing with the Option 1 and 2. If you entomb a piece of concrete in the Carmel River, the cost isn't just the entombment. You've got a hundred, maybe two hundred years of maintenance on this block of concrete that, in fact, if we're all here, we'll still want to keep the fish and wild life and the recreation going on on the river. People like to boat on that river, and right now

GEN-31

the boaters have to carry their boat around this obstruction.

I've personally -- pardon me. I'm from the Carmel River Steelhead Association; I'm the president. I have personally walked through the existing fish ladder, and never has anybody built a fish ladder to a reservoir full of sediment and not had nothing but trouble trying to keep the fish ladder functioning. It's going to cost lots and lots of money. And I propose that the company put up a bond, maybe 50, maybe $75 million for the next 150 years of maintenance on the fish ladder and the dam. Wow.

FI-106

CR-9

I want to also remind you that when you start making new rivers, if you remember your own slide up there with acres and acres and acres of wood in the reservoir, if you don't make your new river wide enough, you'll have a new dam and it will be a wooden dam, so you have to pay attention to that.

HY-15

I am also well aware, as I'm sure you are too, of the years of starving of the lower river for gravel, and I support the concept of sorting and continually supplying sediment; i.e., sand, gravel and cobble to the river to maintain not only the height of the river and the beaches, but to help prevent bank erosion, which apparently that does, which you don't have down in

SED-65

SED-65

sizing of the river.

BOB SMITH: One minute.

FI-107

ROY THOMAS: And I'd like to remind you that the threatened and possibly soon-to-be-endangered steelhead that live in the Carmel River, because their population has been dropping in the last seven years, they have lived in the Carmel River for tens if not hundreds of thousands of years. We don't need a reinforced useless block of concrete on this river that may last another tens of thousands of years. Thank you.

JEREMY PRATT: Thank you again. I apologize. You're quite right, you were the second Roy. You two actually signed up in sequence. I read the name and thought I was done. I apologize.

We have a few more sign-ups, Nikki Nedeff and Jessica Simms.

NIKKI NEDEFF: Thank you. My name is Nikki Nedeff. I'm a lifelong resident of Carmel Valley and have spent, oh, gee, about the better part of 50 years watching, studying, playing on the Carmel River. I'm a riparian plantologist by academic training and actually spent a portion of my professional career coordinating habitat restoration on the lower Carmel River.

GEN-32

I want to echo two speakers' comments. The first speaker mentioned this is an incredibly

GEN-32

complicated project. Indeed it is. Any of the alternatives have massive impacts, far-ranging impacts from traffic to environment, red-legged frog, economic, et cetera.

GEN-33

I'd also like to echo Monica Hunter's comments that this is an opportunity to look at this project in a broader context. This is one opportunity -- removing San Clemente Dam, one opportunity to rectify a whole series of problematic issues on the Carmel River, including increasing water supply, which ultimately will benefit habitat in ways that removing the dam will not.

However, that said, I have very specific comments on removing the dam which I support. I think the reroute option is the most preferable in terms of the impact potentially for the environment. However, removing the sediment from the San Clement side and placing it on the Carmel side still has some issues in my mind. Most importantly, will that habitat which will be lost, the wonderful riparian habitat, habitat for red-legged frog and juvenile steelhead, will that habitat be replaced by upland habitat with the addition of more sediment? So that's the first comment.

AL-24

TE-34

FI-108

Second comment, I think that there needs to be attention paid to the maximum credible earthquake, maximum probable flood impacts on the upstream diversion

SA-3

dam that will reroute the flow of the river through the notch in the ridge. And there also needs to be attention paid to how the face of exposed sediment that is exposed when the dam is taken down, the face of the exposed sediment on the Carmel River side is stabilized. I don't think so.

SA-3

BOB SMITH: One minute.

NIKKI NEDEFF: Grout or rip-rap or anything structural will then withstand potential earthquakes or potential erosion if the Carmel River reoccupies its original channel. So I'd just encourage you to pursue those questions in your final impact analysis. Thanks.

SA-4

JEREMY PRATT: Thank you, Nikki. And Jessica Simms and Keith Vandevere.

JESSICA SIMMS: I'm Jessica Simms. I'm also a Carmel Valley native. I grew up playing, swimming and kayaking. I was just actually up there about a month ago at San Clemente Dam and had to walk my kayak all the way down.

I also support the removal of the dam and the rerouting. It seems to be, of the options discussed, the most economical and sustainable with the least environment implications to the steelhead, the plant species and the air quality due to trucking enormous amount of truckloads of concrete away.

AL-25

I do have some questions as Robert Greenwood asked. I also wonder what will happen to the concrete. What are the impacts on San Clemente Creek? And how prone is it to flooding in the winter and how much of the banks will be eroded from that? And I also think it's important to look at the Matilija Dam in Ventura, I believe, which had similar circumstances before they removed it. Thank you.

AA-60
GEN-34
HY-16
AA-61

JEREMY PRATT: Thanks, Jessica. Keith Vandevere.

KEITH VANDEVERE: Yes. Keith Vandevere. And like some of the last couple of speakers, I've spent all my life or most of my life living in the Carmel Valley watershed. And I'd just like to emphasize I am speaking on my own behalf, not on behalf of any organization or even the governmental entity which I'm often associated, but strictly for myself.

And much of what I was going to say has been covered by other people, but I would like to say that I do very much the support the alternative, I guess it's Alternative 4, the reroute and dam removal alternative. I think it's clearly the environmentally preferable alternative, environmentally superior alternative in this case from my reading of the EIR/EIS.

AL-26

And one thing I would like to point out, one

great advantage that hasn't been mentioned tonight in terms of the dam removal, whether it was through the dam removal without rerouting or dam removal with rerouting, is that right now downstream of the San Clemente Dam there are essentially -- well, since the draining of Garzas Creek there are essentially no tributaries that are suitable for juvenile steelhead to oversummer, whereas upstream of the San Clemente Dam between the San Clemente Dam and the next obstruction, which is the Los Padres Dam, there are several very high-quality, you know, higher-elevation tributaries that do provide significant oversummering opportunities for juvenile steelhead. So that there's a real -- you know, getting fish back and forth past this current obstruction, there's a lot of reason to believe it would be of enormous benefit to the steelhead. And as we all know fish ladders, you know, don't do the job. So thank you very much for holding this hearing tonight and taking these comments.

FI-109

JEREMY PRATT: Thanks, Keith. That's the end of the list of folks who signed up. Does anyone else have comments they'd like to make?

DON REDGWICK: How about rebuttal of a rebuttal?

JEREMY PRATT: You're welcome to come back to

the microphone. It's Don, is it?

DON REDGWICK: My name again is Don Redgwick from Pacific Grove.

I made a comment about buttressing the dam, and there was a comment that I'd like to reinforce my position on that. First of all, I'm a general engineer, a retired general engineering contractor. I have done -- built a few small dams, and I've done slide repairs. I have never buttressed a dam, but I have buttressed slides. And it's basically you've got weight and you are supporting the weight with the buttress. It's a method that can work. The buttress material would have to be secure so it wouldn't erode out or loose and have to be towed. I didn't put all that in my comments.

AA-62

But it is a method that could work that would salvage the existing dam, which is -- you know, I would think, I don't know how many millions of dollars it would cost to build another one like that. It does serve a purpose if it can be saved.

JEREMY PRATT: Thanks. Anyone else who has an additional comment they'd like to make? So each of you come to the microphone. We'll start with you and then --

JIM LAMBERT: All right. I'll wait. I get too nervous if I stand up there.

JEREMY PRATT: Okay.

SERGE ORSHKO (phonetic): I'm Serge Orshko with California Department of Fish & Game. And our agency hasn't yet reached a formal position on the alternatives, so I can't address that.

But just a general comment. Curiously, on the economic potentials of the project, I don't know if it's in the document. It's likely that it is, but for the comparison of the cost of the alternatives it would probably be important when costing out the buttressing option that the perpetual maintenance that will have to happen of the fish ladder and of the sluicing operation in perpetuity that those be disclosed to any decision makers. Thank you.

CR-10

JEREMY PRATT: Thanks, Serge.

JIM LAMBERT: Hi, my name's Jim Lambert. I'm a member of the Carmel River Steelhead Association and I just have a couple of little questions.

Because I couldn't tell on the map that you showed up there of the bypass route, will that provide unobstructed routes for steelhead passage without having any small ladders or anything?

FI-110

JEREMY PRATT: That's correct.

JIM LAMBERT: Is that going to be bulldozed through to some degree? Or will there be tall cliffs

FI-110

and falling? I have no idea what that looks like, because I didn't see a topo map, topographical map.

JEREMY PRATT: We didn't want to get into detailed answers --

JIM LAMBERT: Right.

JEREMY PRATT: -- but it's a fairly simple question. No, there won't be any ladders and the river will be restored.

AA-63

JIM LAMBERT: And will, also, the reservoir still exist if the dam is rerouted, somewhat of a reservoir in the back of the San Clemente Dam?

JEREMY PRATT: There would be no reservoir. The dam would be removed.

JIM LAMBERT: All right. If I'm not mistaken, there is sort of like a lake back in there now.

AA-63

Okay. Then when the silt gets moved out, then that reservoir would no longer exist; is that correct?

JEREMY PRATT: That's correct.

JIM LAMBERT: Thank you. At least you answered two questions for me.

JEREMY PRATT: You were too persuasive, Jim.

JIM LAMBERT: Thank you.

JEREMY PRATT: Any other comments?

Jane, would you like to call the hearing to a close?

JANE HICKS: I call this hearing closed.

JEREMY PRATT: Thank you everyone.

(Time Noted: 8:02 p.m.)

C E R T I F I C A T E

I, KELLI A. RINAUDO, do hereby certify:

That I am a Certified Shorthand Reporter in and for the state of California, CSR license No. 6411, and Registered Merit Reporter and Certified Realtime Reporter;

That said public hearing was held at the time and place set forth and reported by me, a Certified Shorthand Reporter, and was thereafter transcribed by computer under my direction into booklet form;

That I am a disinterested person, not being in any way interested in the outcome of said action, nor connected with nor related to any parties in said action, or to their respective counsel, in any manner whatsoever.

Executed May 30, 2006.

KELLI A. RINAUDO, CSR #6411 RMR/CRR

Appendix E

RESPONSES TO COMMENTS

APPENDIX E – Introduction

The San Clemente Dam Seismic Safety Project Draft EIR/EIS was circulated for public comment from April 21, 2006 through July 3, 2006. A Notice of Availability (NOD) was published in the Federal Register on May 19, 2006 and a Notice of Completion for the EIR/EIS was issued through the California State Clearinghouse on April 21, 2006. A public hearing on the Draft EIR/EIS was held in Carmel Valley on May 23, 2006. More than 650 comments were received on the Draft EIR/EIS. Appendix C contains the written comments received and Appendix D contains the transcript of the public hearing. This Final EIR/EIS has been rewritten to incorporate responses to these comments whenever the comment could best be addressed by modifying the document itself. Additional information is provided in this Final EIR/EIS, which clarifies and amplifies the information included in the Draft EIR/EIS.

Responses to comments are provided in this appendix. Responses to all comments are arranged by subject area. Appendix E also provides reference to the sections of this Final EIR/EIS that have been modified in response to comments. An errata sheet of identified discrepancies between comment labeling in the annotated comment letters from agencies, located in Appendix C, and the responses to comments follows on the next page of this appendix.

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DECEMBER 19, 2007

ERRATA - Appendix E

These errata correct inconsistent numbering between the annotated comment letters found in Appendix C and responses to comments found in this Appendix.

GENERAL

AS/O on some annotated letters is the same as AL in responses

SPECIFIC

Carmel River Steelhead Association (undated, signed by Roy Thun?)

- Annotated Letter FI-111 through FI-113 should be FI-113 through FI-115

Caramel River Steehead Association (Bob Baiocchi, June 28, 2006)

- Annotated Letter FI-114 through FI-118 should be FI-116 through FI-120
- Annotated Letter SED-9 should be SED-69

John W. Fischer

Annotated Letter SED-4 should be SED-20

PCL

- Annotated Letter FI-118 should be FI-121
- There is no FI-119 in annotated letter
- Annotated Letter FI-120 through FI-23 should be FI-122 through FI-125
- Response to SED-71 refers to FI-119 – should refer to FI-121

Don REdgewick

- Annotated Letter AL-2 should be AL-1
- Annotated letter AL-3 should be AL-6
- Annotated letter SED-5 should be SED-4
- Annotated letter WAT-1 and 2 should be WAT-6 and 7

John Williams

- Annotated letter does not include FI-8. Should be at the same place as AA-18

Sleepy Hollow Homeowners Association

- Annotated letter V-15 should be VIS-1
- Annotated letter does not include NOI-2. Should be at the same place as AQ-1

David Zaches

- Annotated letter WQ-2 should be WQ-5

AIR QUALITY

WRITTEN COMMENTS RECEIVED

June 9, 2006 letter from Victoria Kennedy/Sleepy Hollow Homeowners Association

Comment AQ-1

What are the actual activities or measures to control dust and noise? **(Also AQ-13)**

Response

There are several planned fugitive dust (PM_{10}) mitigation measures that address the many sources of PM_{10} during the construction phase of a project (e.g., grading, wind erosion, entrained dust). Please refer to the Final EIR/EIS Section 4.7.3, Issues AQ-1 and AQ-2 for a description of dust mitigation measures and to Section 4.8.3 for a discussion of noise mitigation measures.

Comment AQ-2

If there is a problem with project impacts such as noise, start times, dust, traffic control deficiencies, what will be the remedy, besides merely a phone number and person's name to call? **(Also TR-6)**

Response

The project Applicant will be required to implement the mitigation measures included in the environmental document. The Applicant will be responsible for ensuring that the mitigation measures are implemented. Agencies and local government issuing permits will enforce compliance with permit conditions. Construction monitoring will be conducted to assure that permit requirements, resource protection measures, and mitigation measures are followed. The owner's contracts will embody pertinent requirements, and the Applicant will require contractors to comply with the terms of their contracts. TC-1 for each alternative includes a Traffic Coordination and Communication Plan developed in coordination with the County of Monterey Planning and Building Department, including an on-site field office for a resident Traffic/Transportation Coordinator.

Please refer to the Final EIR/EIS Section 4.7.3, including Issue AQ-3 for a description of enforcement measures for traffic generated air quality impacts.

June 20, 2006 letter from Jean Getchell/Monterey Bay Unified Air Pollution Control District

Comment AQ-3

The Federal 1-hour standard for ozone was revoked on June 15, 2005.

Response

Please refer to the Final EIR/EIS Section 4.7.1 and Table 4.7-1 for incorporation of this information.

Comment AQ-4

With the revocation of the Federal 1-hour standard for ozone, the North Central Coast Air Basin (NCCAB) is no longer classified as Maintenance for the standard. The NCCAB is classified as Non-Attainment Transitional for the State 1-hour standard for ozone.

With revocation of the Federal 1-hour standard for ozone, the NCCAB is classified as attainment for all the federal air quality standards.

Response

Please refer to the Final EIR/EIS Section 4.7.1 and Table 4.7-8 for incorporation of this change in status. The change in status is not anticipated to significantly affect General Conformity or stationary source (i.e., batch plant) permitting issues.

Comment AQ-5

The Plan was adopted by the District Board in December 2005.

Response

Please refer to the Final EIR/EIS Section 4.7.1 for incorporation of this change in SB 656 PM Plan status. The cited plan was officially adopted after the Draft EIR/EIS was published.

Comment AQ-6

With revocation of the Federal 1-hour standard for ozone, the NCCAB is classified as attainment for all the federal air quality standards.

Response

Acknowledged and noted. The change in status is not anticipated to significantly affect General Conformity or stationary source (i.e., batch plant) permitting issues. The permitting process is planned for the Year One of the Project as discussed in Chapter 3 of the Final EIR/EIS.

Clean Air Act (CAA) Section 176(c) prohibits Federal entities from taking actions (e.g., funding, licensing, permitting, or approving projects) in National Ambient Air Quality Standards (NAAQS) nonattainment or maintenance areas which do not conform to the State Implementation Plan (SIP) for the attainment and maintenance of NAAQS pursuant to Section 110(a) of the CAA. The Project would comply with the conformity requirements as stated in Section 176(c) of the CAA. No entity may take action in this area that does not conform to the SIP for the attainment and maintenance of the NAAQS in the North Central Coast Air Basin (NCCAB).

Comment AQ-7

Please contact the District to discuss the calculations for the on-road diesel-powered trucks and suggested mitigation measures to reduce emissions to below District daily thresholds of significance. One suggestion is to mitigate the NO_X emissions by using a product like Viscon, which would achieve an approximate 25 percent reduction in NO_X. Information concerning this product and CARB- and EPA-recognized lab test results is attached for your reference.

Response

Please refer to the Final EIR/EIS Section 4.7.3, Issues AQ-1 and AQ-2, for discussion of reduction of emissions and mitigation measures. The applicant would work closely with MBUAPCD staff upon commencement of permitting activities.

Comment AQ-8

As a precursor to the formation of ozone in an air basin that is non-attainment for the State ozone standard, NO_X is a criteria pollutant of regional (not only local) significance. The distance of the nearest residential receptors does not eliminate the impact of emissions of 443 lbs/day, when the threshold of significance is 137 lbs/day.

Response

Refer to Section 4.7-3 of the Final EIR/EIS. The text has been revised and NO_X emissions are considered a significant, short-term impact.

Comment AQ-9a

Given the distance that particulate matter can travel and the duration of time that it may remain suspended in the atmosphere, as well as the non-attainment status of the NCCAB for the State PM_{10} standard, the distance to the nearest receptors does not eliminate its significance. For road dust, the District suggests that in addition to the mitigation measures listed on pages 4-247 and 4-248, the Project Applicant consider paving any unpaved roads or placing larger-sized crushed rock. Given the duration of the project, this could substantially decrease the formation of fugitive dust.

Response

Please refer to the Final EIR/EIS Section 4.7.3, Issues AQ-1 and AQ-2.

Comment AQ-9b

For emissions from diesel construction equipment, the District suggests use of an additive such as Viscon to reduce NO, emissions and use of a diesel oxidation catalyst to reduce emissions of ROG and PM_{10}. Please contact the District to discuss strategies that have been proven to reduce emissions.

Response

Please refer to the Final EIR/EIS Section 4.7.3. The Applicant would work closely with District staff upon commencement of permitting activities.

Comment AQ-10

The mitigation measures should reduce fugitive dust to within thresholds.

Response

Please refer to the Final EIR/EIS Section 4.7.3. The applicant would work closely with District staff upon commencement of permitting activities.

Comment AQ-11

There is no information concerning the number and types of vehicles to be used in the project, or the daily traffic schedule. This should be provided and URBEMIS 2002 vs 8.7.0 should be run to calculate vehicular emissions. Please provide the District with a copy of the URBEMIS output.

Response

Please refer to the Final EIR/EIS Section 4.7.2 and Appendix X. The calculated information in Appendix X provides daily and annual emissions for each Alternative. However, it is not separated into the types of vehicles on a daily basis. The URBEMIS model is designed for estimating typical urban traffic impacts from residential, educational, recreational, retail, commercial, and industrial development. Non-typical projects such as dam construction work in a rural setting are not part of the URBEMIS model. As such, the URBEMIS model is not applicable for this type of project application. However, URBEMIS emission factors can be used to estimate off-road emissions as described in 4.7.2 and Table 4.7-11.

Comment AQ-12

Please contact Lance Ericksen, Manager of the District's Engineering Division, to discuss permitting requirements.

Response

Please refer to the Final EIR/EIS Section 4.7.3. The Applicant would work closely with District staff upon commencement of permitting activities.

COMMENTS RECEIVED AT MAY 23, 2006 PUBLIC HEARING

Victoria Kennedy/Sleepy Hollow Homeowners' Association

Comment AQ-13

What are the actual activities or measures to control dust and noise? **(Also AQ-1)**

Response

See response to Comment AQ-1.

Comment AQ-14

The preferred batch plant site should be a location that does not cause visual, dust, and noise impacts to any Sleepy Hollow subdivision residents and/or be closer to the dam. What were the limitations to locating the batch plant closer to the dam? **(Also VIS-1, AA-13 and 14)**

Response

Only one of the analyzed project alternatives requires the use of a concrete batch plant, the other four (including the No Project Alternative) do not. The batch plant itself is only a component of the Proponent's Proposed Project, which includes a number of additional elements necessary to the project. Please refer to the Final EIR/EIS Section 4.7.3, Issue AQ-4 for information on batch plant siting. The batch plant requires a level area approximately 5 acres (about 218,000 square feet) in size with good road access in order to move in/out the larger pieces of batch plant equipment and aggregate materials. This limits possible sites for the batch plant to generally near Carmel Valley Road, and not up the canyon closer to the Dam due to mountainous terrain and narrow, winding access roads. There is a smaller site closer to the Dam, but it would not be large enough for large trucks to turn around. Thus, it is not technically feasible to locate the batch plant closer to the Dam. Also, the proximity of electric power lines may avoid the use of diesel generators for batch plant operation, thus avoiding emissions of NO_X, CO, ROC, SO_2 , and diesel fine particulate (PM_{10}).

ALTERNATIVES ANALYSIS

WRITTEN COMMENTS RECEIVED

May 24, 2006 letter from Don Redgwick

Comment AA-1

The report and recommendations should take into consideration the environment, preservation, conservation, water resources and economics of the project. The solution to all of five of these goals is to save the existing dam by reinforcing. The sediment should be moved from the back of the dam to the front of the dam and placed as a buttress. The buttress should be large enough to allow drying of the sediment to about 5% over optimum or should be partially dried prior to being moved. A conveyor could be used to move the sediment to the down stream side of the dam. T he equipment used to move, place and compact the material should stay a safe distance from the dam to protect it from damage. The placing of the fill against the dam should be done by hand and might be done in accordance with a structural backfill. The buttress should be capped in order to protect it from erosion. The capping material could be with a soil cement or concrete. An extended spill-way should be constructed across the buttress and a fish ladder must be constructed in accordance with the latest standards.

Response

Your suggestions have been noted. Although this approach to dam safety is not a project alternative, a range of engineering options to meet the need for dam safety have been evaluated during the development of the project alternatives, considering project feasibility from economic, construction, environmental, and maintenance factors. The alternatives presented in this Final EIR/EIS reflect the options that balance these criteria, meet the project purpose and need, and represent sound engineering solutions.

Comment AA-2

The alternative plan to demolish the dam will have a severe impact on Carmel Valley Road unless the broken concrete and steel are buried on site. A preferable alternative to off haul or burying broken concrete in place is to partially burying the dam intact by buttressing it on the downstream side up to the level of the outflow or top of spillway. Just the top of the dam will be visible from down stream and the dam can serve as a walkway.

Response

Broken concrete will be buried for the dam removal alternative (Alternative 2) at the sediment disposal site as described in Section 3.4.4. The Dam may not be buried intact because that would obstruct fish passage.

Comment AA-3

There appears to be support for the rerouting of the Carmel River because it addresses the sedimentation problem and eliminates the dam. However cutting a whole new river bed could involve significant damage to the environment.

Response

The impacts and mitigation measures associated with Alternative 3 are discussed in detail throughout Chapter 4 and summarized in Table 2-1.

Comment AA-4

In most cases the least environmental damage will be achieved with the least amount of work and materials. The alternative with the fewest materials and workman is the best and cheapest option and that option is a buttress of sedimentary material.

Response

No connection exists between the amount of work performed on an alternative and the level of its impact to the environment.

Comment AA-5

The removal of the existing dam is a radical concept serving only one purpose that should be addressed by the latest federally approved fish ladder. The removal of the dam will destroy many benefits without accomplishing a single benefit that can't be addressed by a government approved method. There is no cost-benefit ratio to consider because there is no benefit in removing the dam.

Response

Thank you for your comment. Your concerns have been noted. The dam removal alternatives are considered to entail both impacts and benefits, as described throughout Chapter 4.

June 4, 2006 letter from Don Redgwick

Comment AA-6

If the geological conditions have been adequate to support the San Clemente Dam for the past 85 years, the conditions should be adequate for an earth dam. If the site is adequate for an earth dam it will be adequate for a buttress utilizing earth dam technology such as key cuts and an impervious core. The impervious core probably should be placed against the concrete dam. Since the sedimentary material is most likely pervious it might require being encapsulated to prevent erosion.

Response

Your suggestions have been noted. Although this approach to dam safety is not a project alternative, a range of engineering options to meet the need for dam safety have

been evaluated during the development of the project alternatives, considering project feasibility from economic, construction, environmental, and maintenance factors. The alternatives presented in this Final EIR/EIS reflect the options that balance these criteria, meet the project purpose and need, and represent sound engineering solutions **(Also AA-1).**

Comment AA-7

The realignment of the Carmel River and the removal of the San Clemente Dam poses more questions than it answers.

- *Is the plan to realignment (sic) the river permanent or a diversion for construction?*
- *Where will the excavated earth from the realignment be placed?*
- *If the realignment is permanent doesn't that significantly reduce the dam safety and steelhead issues and allow the dam to remain for the benefit of frog, bird, lake fish, and other wildlife habitat*? **(Also TE-4, FI-3)**
- *If the dam is removed won't that leave a vertical bank of about 70 to 80 feet of material subject to erosion? Will a grout be adequate to contain the sediment from erosion?*
- *If the San Clemente Dam is demolished and removed won't that result in a 70 or 80 foot thick embankment of unstable sediment? Will the gradient become much steeper when the sediment is spread? Will a grout be used to stabilize the sediment? If a grout is utilized for containment will that provide a suitable habitat for frogs and other wildlife?* **(Also TE-5)**

Response

- Yes, the reroute is permanent. See Sections 2.1.4 and 3.5.
- Excavated materials will be used in the construction of the diversion dike.
- Yes, dam safety and steelhead impacts will be significantly reduced; however, this alternative does not retain the Dam in place. Impacts to terrestrial species are described in Section 4.5.
- No vertical bank will exist. Currently a slope exists at the downstream end of the sediments. After the Dam is removed, the existing sediment face would be excavated and stabilized by mixing with soil cement, resulting in a stabilized slope of approximately 4 to 1. See Figures 3.5-4 and 3.5-5 in Section 3.5. This same method has been used at multiple project locations, including the Port of Oakland.
- See response above. Grout will contain and elevate groundwater in the upstream sediments, preserving wetland habitat for frogs.

Comment AA-8

If the Carmel River is rerouted could a fork in the river be created with control gates to allow a cleansing of the San Clemente Dam site or for temporary diversion for maintenance on the new river alignment?

Response

Your suggestions have been noted. Creating a fork in the river with control gates would introduce an unnecessary element of complexity to the project. It is not clear what is meant by "cleansing of the San Clemente Dam (SCD) site." The restored San Clemente Creek channel will not require temporary diversion of the Carmel River for periodic maintenance. The Dam would be completely removed under Alternative 4.

Comment AA-9

The existing dam could serve an important function in the development of a diversion plan for the building of a buttress. However, information about the diversion plan used in the building of the dam in 1921 could lead to the locating of an abandoned tunnel. Does the County, State, Cal Am or someone else have documents from the original construction?

Response

Yes, the State and CAW have the documents from the original construction. No abandoned tunnel exists. A diversion plan for each of the project alternatives is described in Chapter 3.

Comment AA-10

I believe the most important issues are developing a diversion plan for the river during construction. **(Also GEN-1)**

Response

There is a drawdown and diversion plan. See Figure 3.2-9 of the EIR/EIS for the drawdown and diversion plan for the Proponent's Proposed Project. The other action alternatives would have similar plan.

June 21, 2006 letter from Carmel Valley Association / Robert Greenwood

Comment AA-11

The major reason for this study is the potential damage to the dam by an earthquake. However, under Alternative #3, with the dam removed and the Carmel River diverted into San Clemente Creek, the mass of sediment now behind the dam would be left as a free-standing block. A major earthquake could surely destabilize and set in motion this mass of sediment, more easily than under the No Action alternative. The EIS needs to address this contingency.

Response

The accumulated sediment would not be left as a free-standing block. After the Dam is removed, the existing sediment face will be excavated and stabilized by mixing with soil-cement; resulting in a stabilized slope of approximately 4 to 1 (see Figures 3.5-4 and 3.5-5 in Section 3.5). This same method has been used at multiple project locations, including the Port of Oakland. The stabilized slope would be engineered to withstand a MCE.

May 23rd Community Meeting Questions from Victoria Kennedy / Sleepy Hollow Homeowners Association

Comment AA-12

Is the proposed batch plant location within 500 feet of two residences?

Response

The batch plant boundary would be approximately 500 to 600 feet from adjacent residences.

Comment AA-13

Whether or not the plant's location is within 500 feet of two residences, what alternative batch plant sites were analyzed? **(Also AQ-14, VIS-1, NO-4)**

Response

The concrete batch plant is a component of the Proponent's Proposed Project, which includes a number of elements necessary to the project. Please refer to Section 3.2 in this Final EIR/EIS for information on the batch plant. The batch plant requires a level area approximately 5 acres (about 218,000 square feet) in size with good road access in order to move in/out the larger pieces of batch plant equipment and aggregate materials. This limits possible sites for the batch plant to near Carmel Valley Road, and not up the canyon closer to the Dam due to mountainous terrain and narrow, winding access roads. There is a smaller site closer to the Dam, but it would not be large enough for large trucks to turn around. Thus, it is not technically feasible to locate the batch plant closer to the Dam. Also, the proximity of electric power lines may avoid the use of diesel generators for batch plant operation, thus avoiding emissions of NO_X, CO, ROC, SO_2 , and diesel fine particulate (PM_{10}).

Comment AA-14

What were the limitations to locating the batch plant closer to the dam?

Response

The concrete batch plant would require site access and surface area, which is not available at location closer to the Dam. **(Also AA-13)**

Comment AA-15

What is estimated time to complete the project?

Response

The estimated project completion dates vary with the different alternatives. Project duration and construction schedules for the different alternatives are provided in Chapter 3.

Comment AA-16

What would be longest expected time to complete the project?

Response

The longest expected time for project completion is under Dam Removal (Alternative 2), which would require five years to complete construction (after an initial two years of design work and environmental monitoring). Each project schedule could be lengthened by numerous factors, such as weather, contractor availability, contractor delays, permitting, and environmental compliance.

June 13, 2006 letter from John G. Williams, Ph.D.

Comment AA-17

The sediment stabilization in the by-pass alternative should be reviewed. Long-term stabilization of unconsolidated sediments in the historical river channel is a critical element of the by-pass alternative, since failure would deliver large amounts of sediment to the river, with possibly great economic and environmental harm. Either evidence should be provided that the stabilization method proposed is routine and well tested, or the engineering details for such stabilization should be subject to independent expert review before this alternative is selected.

Response

This stabilization method is well tested and commonly used; for example, it has been used in the Port of Oakland for stabilization of underwater slopes of weak, saturated soils. Typically design details of the stabilization method will be provided in final design stages. In general, numerous slope stabilization methods have been used in the past century and show that 4:1 slopes can be easily stabilized.

Comment AA-18

The DEIR should consider modifications to the notching alternative. The proposed notch as shown in Figure 3.3-2 is level all the way across. It would seem more sensible to have a notch within the notch, sized to the anticipated active channel of the river that would tend to hold the thalweg of the stream in one place. This could be placed at the point where fish would be least likely to be injured in passing over the dam. All else equal, the notch should be placed near the fish ladder. **(Also FI-8)**

Response

The thalweg of the stream will be maintained through implementation of the Sediment Operation and Management Plan for Fish Passage (SOMP, Appendix J). Placing a notch near the fish ladder could potentially expose upstream migrating adults that exit the ladder to high velocities with high potential to be swept downstream through the notch. Because the risk of fallback is high, placing a notch near the ladder was not considered further **(Also FI-8).**

June 30, 2006 letter from Trish Chapman / California Coastal Conservancy

Comment AA-19

The EIR/EIS analyzes two alternatives for dam removal – one which involves complete removal of all of the accumulated sediment from the area and one which would re-route the Carmel River to isolate the accumulated sediment. The EIR/EIS should also evaluate the potential for stabilizing the sediment along the banks of the Carmel River and allowing a new conveyance channel to be cut along the original stream thalweg, or some other alignment, through the reservoir. The approach being used for sediment stabilization on the Elwha Dam Removal project could serve as a model. **(Also NEPA/CEQA-4)**

Response

It is not clear from the comment whether the author is proposing consideration of an alternative that would allow unmanaged sediment transport downstream. Such an alternative was considered in the 2000 RDEIR and was rejected due to potential downstream impacts on public safety that would be caused by the flood hazard associated with channel aggredation, and because of predicted impacts to spawning habitat.

A range of engineering options to meet the need for dam safety were evaluated during the development of the project alternatives and considered project feasibility from economic, construction practicability, environmental, and maintenance perspectives. The alternatives presented in the EIR/EIS reflect the options that balance these criteria, meet the project need, and represent sound engineering solutions. The concept of stabilizing sediment in place is an element of Alternatives 1 and 3. Under Alternative 1, a geomorphically stable stream channel would need to be reestablished in the sediment remaining after excavation down to the level of the notch that would be made in the dam at elevation 509 feet. Under Alternative 3, sediment would be stabilized in place on the Carmel River and a geomorphically stable channel would be established in San Clemente Creek.

Based on the narrow geometry of the channel and the large amount of sediment already existing upstream of the dam, large amounts of sediment could not be stabilized on the banks of the Carmel River under a dam removal alternative.

June 20, 2006 letter from Mark Delaplaine/California Coastal Commission

Comment AA-20

Alternatives 2 and 3, dam removal and dam removal and re-route, would excavate and dispose of the more than 2.5 million cubic yards of sediment that are now stored behind the dam. Notwithstanding the beneficial re-use of river sediment, these sediment piles should be held to the same standards regarding "Maximum Credible Earthquake" and "Probable Maximum Flood" as the dam itself. If the debris pile in either alternative should fail during an earthquake or a flood, it would effectively dam off the river again. The project description should account for these standards, their implementation, monitoring and maintenance with regard to the sediment storage piles.

Response

Under both alternatives, sediment would be stabilized to withstand MCE and PMF criteria. Under Alternative 2, stabilization would be achieved in the sediment disposal at Site 4R as described in Section 3.4. Under Alternative 3 (which would excavate less than 500,000 cubic yards of sediment), stabilization would occur in-place, as described in Section 3.5.

Comment AA-21

In Alternative 3, the sediment storage plan appears to include the possibility of voids in the sediment pile, such as decomposing tree trunks, because not all of the sediment would be excavated to the original streambed, and sediment close to the dam would be piled on top of existing sediment. Large organic items that were originally covered when the dam filled, and later buried when the sediment began to collect, could have had some contact with air, continue to decompose and leave a void. The Draft EIR/EIS should include a plan to eliminate the possibility of voids. It is possible that the stabilizing plan for this pile, i.e., the soil-cement grid, would obviate this danger. If this is the case, the Draft EIR/EIS should explain how the soil-cement grid would accomplish this.

Response

The preliminary design of the proposed sediment stabilization method has considered the standard loading and failure criteria used in engineering design of slopes. There is no danger from voids causing problems in the stabilized slope. June 29, 2006 letter from David A. Berger/Monterey Peninsula Water Management District

Comment AA-22

Page 3-2, Para 5: Under Removal of Dam Superstructure. Given that most alternatives would likely take several years before construction could start, is the possibility of implementing this measure being discussed as part of an Interim Retrofit Project? If so, this should be described.

Response

Interim dam safety measures have been implemented at the direction of the Department of Water Resources, Division of Safety of Dams (DWR/DSOD). Removal of the dam superstructure is not considered a necessary interim safety measure.

Comment AA-23

Page 3-15, Para 3: Under Fish Ladder, the description for FEIR/S should be revised to reflect installation and operation of the fish bypass for downstream migration during Interim Retrofit Operations.

Response

This comment appears to address the question of what measures would be taken to pass fish during construction of the fish ladder. Details about the proposed SCD fish ladder are discussed in Section 3.2.6. Since the old fish ladder would be removed and the new one replaced at times the fish would not be in the river, no other measure would be needed to pass fish during construction of the fish ladder. Measures to be taken to protect fish during other construction activities are discussed in Chapter 4.4. of the Final EIR/EIS.

Comment AA-24

Page 3-17, Figures 3.2-5, 3.2-6 and 3.2-7: These figures appear out-of-date (Woodward-Clyde 1998) and do not match the features described in the text for fish passage and sediment sluicing. The FEIR/S should provide new updated versions.

Response

Figures 3.2-5 and 3.2-6 have been revised to reflect the current proposal for sediment sluicing and fish passage.

Comment AA-25

Page 3-18, Figure 3.2-6: The profile of the thickened dam shows a seven-foot diameter sluiceway at an invert elevation of 514, a two-foot diameter sluiceway at an invert elevation of 517, and an eight-foot diameter sluiceway at an invert elevation of 491. The discussion on p. 3-25 starting with "High-Level Outlets" describes operations that apparently would include sluicing of sediment through all three of these pipes, whereas the analysis of proposed sluicing presented in Appendix I describes placement of a new 10-foot diameter pipe through the thickened dam at an invert elevation of about 515. Please resolve the discrepancies between the main text and Appendix I.

Response

Figures 3.2-5 and 3.2-6 have been revised to show that sluicing would occur at only one location which would be a new sluice port at an invert elevation of 515 feet on the left upstream face of the Dam. This port would serve both maintenance and fish passage

needs. The 2-foot and 8-foot diameter sluiceways have been eliminated and the 7-foot diameter sluiceway has increased to 10-feet and relocated as discussed in Appendix S (Additional Modeling to Evaluate Sediment Sluicing Options and Compare Downstream Sediment Concentrations for EIR/EIS Alternatives, San Clemente Dam Seismic Safety Project). Please note that appendices have been updated in the Final EIR/EIS in response to comments and additional appendices have been included. Therefore, Appendix I is now a discussion of commercial values of sediment and Appendix S contains updated information on the MEI evaluation of sluicing operations. Other studies and reports addressing the issue can be found in Appendix M (Sediment Transport Modeling), Appendix N, (Summary of Hydraulic and a Sediment-transport Analysis of Residual Sediment: Alternatives for San Clemente Dam Removal/Retrofit Project) Appendix O (Suspended Sediment Concentration Associated with a Sluice Event), and Appendix P (Suspended Sediment Concentrations Exceedence for Alternatives).

Comment AA-26

Page 3-21, 1st bullet under Para 3: What keeps sediment and water from upwelling in the area between sheet pile barrier and dam intake during the drawdown? How would this area be dewatered without a seal capable of withstanding the differential pressure between the drawn down water surface elevation (510) and the gate at elevation 494? The FEIR/S should fully evaluate this aspect and recommend mitigation measures to match results of the evaluation.

Response

Sheetpiles have been designed and installed at project sites worldwide at 50 feet in height and greater, resisting the soil and water pressure using standard engineering design measures. Any upwelling can be handled by using sump pumps to dewater the area, if necessary. The design of the sheet piles will ensure that they can withstand such pressures, details of which will be provided during final design stages.

Comment AA-27

The discussion includes the following statement: "…the increased spacing between piers would reduce the buildup of downed trees and other debris at the existing closely spaced piers."

What effect could the modification of the spillway to allow passage of large trees have on downstream bridges and other infrastructure? Are there methods to reduce the impacts of large trees on downstream structures?

Since the dam was constructed in 1921, most of the large trees passing into the reservoir have been cut into small sections in order to pass through the spillway bays. Nineteen bridges currently span the river downstream of the dam. Seven are publicly maintained (one by CALTRANS, five by Monterey County Public Works Department, one by the Monterey Peninsula Regional Parks District). The remainder are privately owned and maintained. All the bridges have supports within the 100-year floodway. Ten

bridges have center piers in the active channel. At bridges with supports in the active channel, the minimum open length between abutments and center piers ranges from a low of about 15 feet at the south abutment of Boronda Road Bridge to as large as 80 feet at the Rancho San Carlos Road bridge. Cranes or other equipment capable of picking up trees and logs are frequently stationed at five of the 19 bridges during high flows. Equipment operators generally pick up debris caught on the upstream side of piers and abutments and transfer it downstream. Because of the difficulty associated with this (forceful flows, difficult access), and the type of equipment used (small cranes or backhoes), the largest pieces that can be moved are in the 20 to 25-foot range (2-4 tons). Larger pieces require specialized equipment, such as a boomcrane and hook assembly. The remaining 14 bridges either don't have center piers and are usually debris-free, or are not accessible to cranes.

A large amount of debris passes from the upper watershed through the river system and includes large trees, as shown in the photo below taken during the March 10, 1995 flood. The entire watershed of approximately 125 square miles above the dam contributes debris, although a small amount of debris becomes waterlogged and sinks near the Los Padres Dam spillway (note that the Los Padres Dam spillway is designed to be self-cleaning and passes a significant fraction of the debris from upstream).

Response

The existing spillway is already able to pass large trees and a new spillway would only augment that ability. This augmented ability is necessary for dam safety and is considered a dam safety improvement. The new spillway will not increase impacts associated with passing large trees.

Comment AA-28

Page 3-25: Location of High-Level Outlet: Appendices I and J describe the location of a sluice port as being 10 feet laterally away from the fish ladder. This does not match the description on page 3-25 and is not shown in Figure 3.2-12 for the new fish ladder. The orientation of discharge from the 10-foot diameter sluice gate, located 10 feet from the entrance to the fish ladder, appears to impinge on the left downstream walls of the canyon. This orientation, while effectively designed for sluicing material away from the fish ladder, may threaten integrity of rock supporting the new ladder and result in significant impingement loss of any fish passing downstream. Mitigation measures are needed to ensure that no fish are in the vicinity of the gate when it is opened and the discharge should be directed away from the canyon walls. **(Also FI-29)**

Response

The description in Chapter 3 has been revised to correctly describe the location and orientation of the sluice port. Figure 3.2-12 highlights the fish ladder design only; sluiceway details are shown on Figures 3.2-5 and 3.2-6. The location and orientation of the sluiceway would result in discharging into the plunge pool and would not impinge on

the left downstream canyon wall. Rock integrity would be protected by shotcrete installed as part of dam thickening.

Operation of the sluice gate would be coordinated with operation of the fish ladder. During wet season operations, prior to operation of the sluice gate, access from the ladder into the reservoir would be prevented by closing a gate at the upstream end of the fish ladder that would prevent adult steelhead from moving into the reservoir. Access from the ladder into the remnant reservoir would be closed for several hours prior to a sluice event allow for fish that had exited the ladder to move upstream away from the sluice port. Operation of the sluice port would not occur until flows reach about 300 cfs over the Dam. The sluice port would be partially opened to increase velocities in the area in front of the port and encourage any fish that may be in the vicinity to move upstream and away from the port. The port would then be opened fully for a two hour period. Neither of these measures can assure that all fish would be prevented from entrainment in the sluice event and could result in fallback. Fallback may already occur under existing conditions as fish that ascend the ladder get swept back downstream over the spillway. The increase in the amount of fallback is expected to be small since wet season sluicing will be minimized and if it does occur, would occur for a period of two hours per event. The fish that are swept back downstream would have to re-ascend the ladder.

Comment AA-29

Page 3-26, page 3: Under electrical system. "The existing structure would be replaced with a small pre-engineered building that would house the electronic controls for the outlet valves." How would the system operate during a power failure at a time when the sluicing outlet valves are in an open position? Is auxiliary power proposed, or can the valves be operated manually?

Response

Auxiliary power will not be necessary since leaving sluiceways open or closed will not pose a dam safety threat. They can be operated manually in the event of a power failure.

Comment AA-30

Page 3-28, Para 4: Under Access from Existing Gate to San Clemente Dam: This section contains vague statements or factual errors, including: 1) the description of the location of the high road and low road; 2) the Old Carmel River Dam bridge is described as 5,800 feet long (it appears to be no longer than about 100 feet); and 3) a lack of a Figure reference and confusion created by stationing call-outs with no visual reference.

Response

1) It is unclear where the high road description contains factual errors. Stationing is provided for reference and further clarification is shown on Figure 3.2-2.

2) The Final EIR/EIS has been revised to indicate that the OCRD is roughly 200 feet long.

3) Text has been modified to refer to Figure 3.2-2 for stationing reference and road segment locations.

Comment AA-31

Page 3-29, Para 5: statement, "The roadbed would be filled with sand and gravel and topped with crushed rock…" Is there a potential for fill material to be mobilized during high flows? If so, only clean gravel and rock should be used, without the addition of fines.

Response

There is potential for the roadbed fill to be mobilized. Clean gravel would be used. In addition, the roadbed facing the riverside would be protected with large rock, so that it would be locally redistributed on the roadbed, minimizing entrainment into the river. The volume of gravel, roughly 3 cubic yards, is not a large amount and would not create significant impacts to the river downstream. The roadbed would be in place for up to two years during construction, after which time it would be removed.

Comment AA-32

Page 3-31, Para 2: Under San Clemente Dam Fish Ladder Replacement. "For stream flows up to 55 cfs, all flow would pass through the proposed ladder." This design will encourage passage of fine grained sand and silt into the vicinity of ladder exit and hasten the need to sluice sediment from around the ladder exit and channel leading to the river. The FEIR/S should evaluate ways to mitigate this impact with a goal of having no impact on attraction of fish to the ladder entrance in the plunge pool.

Response

Please refer to revised SOMP (Appendix J) and updated discussion in Sections 4.2 and 4.4 regarding sediment passing through the fish ladder. The fish ladder is designed to pass fine sediment. If sediment accumulates and causes fish passage issues, periodic excavation of the fish ladder exit would occur.

Comment AA-33

Page 3-34, Figure 3.2-12, there is a note referencing water surface elevations in the upper pool of 527 feet at 700 cfs and 522 feet at 110 cfs, but these do not match proposed normal operating elevations referenced in other sections of the EIR/S. The FEIR/S should reevaluate all descriptions, operations and impacts that are based on these incorrect assumptions.

Response

We can find no discrepancy between Figure 3.2-12 and the discussion in other sections of the EIR/EIS. The discussion at Section 3.2.6 is consistent with the figure regarding the 700 cfs flow (Section 3.2.6 cites an elevation of 526.7 feet; the figure shows 527± feet). For the flow at 110 cfs, the comment appears to be confusing flow elevations in the upper pool with those at the fish ladder. Flow assumptions for the fish ladder are described in Section 3.2.6 and reflect the current assumptions and design for the fish ladder that would be required for the Final EIR/EIS.

Comment AA-34

Page 3-35, Para 2: The FEIR/S should document the actual elevation of the plunge pool and hydraulic control for this location. This will be important for all of the alternatives. For example, with the PPP the hydraulic control for the plunge pool needs to be set to prevent down-cutting below the bottom of the entrance pool. Considering the historical down-cutting at this site and the continued lack of coarse bedload with PPP, this project may require construction of a grade control below the ladder entrance, which is a typical feature at other sites where ladders are constructed below dams.

Response

Your comment has been noted. This will be addressed in final design of the project.

Comment AA-35

Page 3-35, Para 5: Under Reservoir Maintenance, a reference to a Figure showing the dam and sluice pipes should be provided.

Response

The Final EIR/EIS has been updated to refer to Figures 3.2-5 and 3.2-6 at this location.

Comment AA-36

Page 3-35, Para 5: Under Reservoir Maintenance. "The automated operating mechanism and manual emergency crank will be located at the dam crest, where a physical connection to the gate via a threaded steel bar is turned to lift the gate for opening and closing." The EIR/S should review and evaluate the feasibility of providing a manual emergency crank which can be used to lift a 10-foot diameter steel gate by turning a threaded bar. This evaluation should include estimates of the time and staffing needed to manually close the gate.

Response

A manual emergency crank is included in the proposed design. One person can operate the manual crank.

Comment AA-37

Page 3-36, Under Construction Schedule and Operations and page 3-38, Figure 3.2-14: The schedule needs to be updated. Is the Public Utilities Commission process for recouping expenditure of funds a critical component of completing a project?

Response

The important information in the schedule is the timing, sequence and duration of the activities comprising the project alternatives. Given the uncertainty as to when projects might begin, this Final EIR/EIS has been updated to show construction schedules in terms of elapsed time rather than calendar years. The California Public Utilities Commission (CPUC) process will not affect the elapsed time project construction schedule.

Comment AA-38

Page 3-41, Para 1: "Notching San Clemente Dam to approximately elevation 506 in the area of the existing spillway bays…" The lower portion of the dam notch appears to be significantly wider than a channel that would be excavated through the sediment remaining upstream of the dam. The FEIR/S should show the transition (plan view, cross-sections, and profile) between channels in the reservoir sediments, modified dam, and channel downstream. Does the configuration of the modified dam encourage the mobilization of sediment from behind the notched dam? **(Also SED-30)**

Response

A final channel profile, cross-section and plan view will be determined in the design of the channel. Notching of the Dam includes the removal of about 930 acre-feet of sediment that is currently stored in the reservoir above the elevation of the notch. Mobilization of sediment would be similar to mobilization under the Proponent's Proposed Project, and is discussed in Section 4.2.

Comment AA-39

Page 3-56, Para 2: Statements on stream flow up to 55 cfs being routed through the ladder and dredging upstream of the fish ladder should be reviewed and updated per previous comments re: PPP on pages 3-33 to 3-35. **(Also FI-37)**

Response

Thank you for drawing this to our attention. These issues are addressed in the revised SOMP (Appendix J), and in revisions to Sections 3.2, 4.2, and 4.4.

Comment AA-40

Page 3-57, Para 3: Under construction schedule and operations, statements in the FEIR/S about the schedule for final engineering and beginning of construction should be revised based on the anticipated date of a selection of an alternative.

Response

The important information in the schedule is the timing, sequence and duration of the activities comprising the project alternatives. Given the uncertainty as to when projects might begin, the Final EIR/EIS has been updated to show construction schedules in terms of elapsed time rather than calendar years.

Comment AA-41

Page 3-63, Para 1: "Removal of the dam requires prior removal of the sediment accumulated in the reservoir to approximately the depth of the original streambed when the dam was placed in service in 1921." The low point of the pre-construction ground surface shown in Figure 3.3-2 is shown as 454 feet elevation. But, the existing excavation limit at the Dam site is shown as extending down to elevation 435 at station 18 (1920 stationing) in the same figure. The FEIR/S should evaluate how the streambed will be reconfigured and stabilized at the toe of the existing dam considering that the existing excavation limit is ~ 20 feet lower than the original streambed level.

Response

The stream restoration design will occur in a newly-excavated channel; the fact that the original (1921) excavation for construction at SCD was lower than the original streambed does not introduce a new restoration design challenge. This excavation occurred at the dam site itself, not throughout the stream. A stream restoration plan will be prepared as part of final design.

Comment AA-42

Page 3-73, Para 5: "Sediment would be removed to approximately the depth of the original streambed that existed in 1921." This should be reconciled with the cross-section in Figure 3.3-2 that shows the original bed was excavated approximately 20 feet lower when San Clemente Dam was built in 1921. The FEIR/S should review and evaluate how the lowered section at the Dam site will affect sediment transport, especially in the vicinity of the confluence with San Clemente Creek and the toe of the new sediment plug in the old river channel.

Response

This Final EIR/EIS has been updated to indicate that the original bed was excavated 20 feet below its original level. Sediment transport with a reconstructed, geomorphically stable stream channel is discussed in Section 4.2. A stream restoration plan will be prepared as part of final design.

Comment AA-43

Page 3-80, Para 3: "The 200-foot wide by 3-foot thick by 40-foot deep soil cement cutoff wall will be constructed to bedrock to prevent undermining and seepage of river flows below the diversion dike." How will a high phreatic water surface be maintained in the old sediment layers immediately upstream of San Clemente Dam, which is described on

page 3-75 Para 3 as a project goal? The FEIR/S should fully evaluate how the existing wetlands will be maintained given the lack of seepage past the diversion dike and the 550 foot elevation of the proposed sediment disposal area. Based on the distribution of habitat types in the existing inundation zone, it is more reasonable that the higher elevation of new sediments in the disposal zone and lack of seepage from the old river channel will severely limit distribution of phreatic zones and reduce wetland coverage in the project area. This should be fully evaluated in the FEIR/S and adjustments made to estimates of jurisdictional wetlands. **(Also WET-5)**

Response

The cutoff beneath the diversion dike will be placed for maintaining the foundation stability of the dike; however, the dike itself will be permeable. The intention is to allow seepage that will maintain a high water table in the area downstream of the diversion, so that habitat for riparian species will persist.

June 15, 2006 letter from Pam Krone-Davis/RisingLeaf Watershed Art

Comment AA-44

Rather than using an artificial substance to stabilize the sediment, we would like to propose using trees and other roots as a stabilizing force. Roots naturally jell sediment into place and then serve the dual purpose of forming a habitat. With man-made substances, there is always the issue of pollution and of long-term degradation and failure. We feel that nature itself can provide the safest and surest long-term solution to holding the sediment in place. We would like to see the following questions addressed: Why would a manmade substance be used for stabilizing the sediment when nature has a proven and long-term effective method of stabilization? What are the potential hazards of using a manmade jell? What long term mitigating measures would then be required? What would the economic cost of this be?

Response

The project alternative development primary concern is to assure stabilization with well known engineering methods. Bioengineered solutions can be considered during final design stages. The soil cement is widely used and is not a hazardous substance.

June 30, 2006 comments from National Marine Fisheries Service

Comment AA-45

Referring to page 3-27, NMFS is unclear whether the new Tularcitos Road will be used for all the alternatives or only the Proponent's Proposed Project and Alternative 1. Please clarify.

Response

The Tularcitos Access Route will be used only for the Proponent's Proposed Project.

Comment AA-46

Referring to page 3-35, NMFS is unclear whether dredging upstream of the reservoir every three years will be needed along with sluicing. Please clarify and analyze all impacts to steelhead in the reservoir if dredging is to occur. **(Also FI-66)**

Response

The Final EIR/EIS has been updated to address these issues, including a revised Sediment Operations and Management Plan for Fish Passage (SOMP) (Appendix J) and revised environmental evaluations in Sections 4.2 and 4.4. Dredging may be used to establish a fish passage channel prior to the beginning of each migration season. The text on Page 3-35 has been revised and is consistent with the rest of the document.

Comment AA-47

Referring to page 3-80, NMFS recommends lowering the height of the diversion dike to the minimum height needed for hydrologic function (i.e., overtopping of 100-year storm event, stability). The additional excavated sediment (in excess of what is needed for the diversion dike) could be spread over the entire sand delta and/or crushed to improve compaction.

Response

Providing freeboard is necessary for diversion dike design and is based upon sediment and flood routing performed to date. The diversion dike height may be further evaluated as a part of final design.

Comment AA-48

Referring to page 4-128 (Issue FI-1: Access Route Improvements):

Second paragraph under Impact states, "The Carmel River would not be dewatered to upgrade the piers and bridge deck at the ORCD." However, on Pg 4-82, under Issue WQ-4, it states, "…stream diversions would be required in Tularcitos Creek, in the Carmel River at the OCRD Bridge." Please clarify if the river will be diverted or not at the ORCD bridge for construction work.

Response

There will be partial stream diversion at the OCRD (Old Carmel River Dam) Bridge for construction. Section 4.3.3 has been clarified.

Comment AA-49

The replacement of the existing OCRD Bridge is needed only under the Proponent's Proposed Project. Under Alternative 3, this bridge and the OCRD could be removed entirely for improved passage of steelhead since the bridge will not be needed **(Also GEN-12).**

Response

Removal of the OCRD for fish passage could be considered separately, but is not required to meet the purpose/objectives and need of this project.

NOTE: COMMENTS AA-50 THROUGH AA-63 CORRESPOND TO COMMENTS RECEIVED A THE MAY 23, 2006 PUBLIC HEARING

Comment AA-50

Charles Franklin/Resident

How was the condition of the existing reinforcing steel assessed?

Response

There is minimal reinforcing steel in the Dam (e.g., spillway piers and at the crest) and it is not relied upon for structural strength in the overall dam structure, nor is it an essential element in dam safety designs.

Comment AA-51

Charles Franklin/Resident

How large a head pressure source does Cal Am need to keep up and maintain the system? Is there going to be some permanent residual water retention object up there?

Response

In order to maintain pressure in its system, CAW requires intake at El. 525. The Proponent's Proposed Project and Alternative 1 are the only alternatives that would retain existing structures and water behind the Dam. All of the alternatives to the Proponent's Proposed Project, including Alternative 1 (Dam Notching), will require a new intake system upstream that draws water directly from the river at a pressure head of El. 525. The new intake system would not require a water retention structure. See discussion of the new intake system in Section 3.3.4 on the modification of low-level outlet works and CAW water diversion point.

Comment AA-52

Roy Kaminski

I'm just wondering if it's feasible to notch the dam a little more, lower the water level, and then put a conduit, maybe a 20-foot conduit, like run under the Thames River 200 years ago, you've gone under the English Channel, put in a 20-foot conduit into the middle of it or the base of it, and then you can drain it, and then you can drain the sediment.

Response

Although this approach to dam safety is not a project alternative, a range of engineering options to meet the need for dam safety have been evaluated during the development of the project alternatives, considering project feasibility from economic, construction, environmental, and maintenance factors. The alternatives presented in this Final EIR/EIS reflect the options that balance these criteria, meet the project purpose and need, and represent sound engineering solutions **(Also AA-1, AA-6)**.

Comment AA-53

Roy Kaminski

What you might do is consider a dam, a water -- a rubber dam or some balloons, maybe only three feet, just to keep water flowing the year round. And then when the flows -- when it flows, then you can turn down the dam. But I'm thinking that it may be a feasible option to notch it, lower the water level, and then drill into, maybe the center, maybe close to the base. Then that takes all of that sediment out of there or takes all of the water out of there, takes all of the weight that's pushing up against the dam now and you may not have to do anything else. Thank you.

Response

See response to AA-52. Dam notching is considered as part of Alternative 1.

Comment AA-54

Robert Greenwood/Carmel Valley Association

The alternatives for dam removal don't say what will be done with the concrete.

Response

For Alternatives 1 and 2, the concrete will be disposed of at the sediment disposal site (see Section 3.4.4). For Alternative 3, a major portion of the broken concrete will be used in the stabilization of the sediment pile (see Figure 3.5-5). The rest will be used as rip-rap for the stabilized sediment slope.

Comment AA-55

Don Redgwick/Resident of Pacific Grove

The buttress should be large enough to allow the sediment to dry to about five percent of optimum in order to be able to secure reasonable compaction. And the material, there should be some kind of capping of the sediment for erosion control, and that would be true whether you reroute the river or not to get that sediment out. I don't know the nature of the sediment, but I imagine it's pretty erodible. (sic)

Response

Your suggestions have been noted. Although this approach to dam safety is not a project alternative, a range of engineering options to meet the need for dam safety have been evaluated during the development of the project alternatives, considering project feasibility from economic, construction, environmental, and maintenance factors. The alternatives presented in this Final EIR/EIS reflect the options that balance these criteria, meet the project purpose and need, and represent sound engineering solutions **(Also AA-1, AA-6, and AA-52)**.

Comment AA-56

Don Redgwick/Resident of Pacific Grove

The demolition of the dam and the removal of the sedimentation will have a severe impact on Carmel Valley Road unless the broken concrete and steel are buried on-site, and the sediment can't be placed somewhere else in the vicinity of the dam.

Response

The concrete will be disposed of at the sediment disposal site (see Section 3.4.4). A major portion of the broken concrete will be used in the stabilization of the sediment pile (see Figure 3.5-5). The rest will be used as rip-rap for the stabilized sediment slope.

Comment AA-57

Don Redgwick/Resident of Pacific Grove

The rerouting of the Carmel River will not cause the sediment to be stable and now to resist water runoff from the surrounding hills without some means of stabilization.

Response

For a discussion of the approach to stabilizing sediment under Alternative 3, please refer to Section 3.5.4. Sediments will be placed in a pile in thin lifts and compacted. Soil cement mixing and geotextiles will be used to stabilize it. In addition, broken concrete from the demolished dam will be placed at the toe of the sediment slope for further protection.

Comment AA-58

Victoria Kennedy/Sleepy Hollow Homeowners Association

The other questions are: Is the proposed batch plant location for the dam strengthening within 500 feet of any of the Sleepy Hollow residences? And whether or not the plant's location is within 500 feet of the residences, which alternative batch plant sites were analyzed? The preferred batch plant site would be a location that does not cause visual, dust and noise impacts to any Sleepy Hollow subdivision residents and be close to them. What are the limitations to locating the batch plant closer to the dam?

Response

Please refer to responses to comments AA-12, AA-13, and AA-14

Comment AA-59

Victoria Kennedy/Sleepy Hollow Homeowners Association

What's the longest expected time to complete any of these projects? I know you have approximate times, but what's the longest time?

Response

Please refer to response to Comment AA-16.

Comment AA-60

Jessica Simms/Resident of Carmel Valley

I also wonder what will happen to the concrete **(also AA-56).**

Response

The concrete will be disposed of at the sediment disposal site (see Section 3.4.4). A major portion of the broken concrete will be used in the stabilization of the sediment pile (see Figure 3.5-5). The rest will be used as rip-rap for the stabilized sediment slope.

Comment AA-61

Jessica Simms/Resident of Carmel Valley

I also think it's important to look at the Matilija Dam in Ventura, I believe, which had similar circumstances before they removed it.

Response

The engineering and environmental documentation related to Matilija Dam have been reviewed by the project team.

Comment AA-62

Don Redgwick/Resident of Pacific Grove

I made a comment about buttressing the dam, and there was a comment that I'd like to reinforce my position on that. First of all, I'm a general engineer, a retired general engineering contractor. I have done built a few small dams, and I've done slide repairs. I have never buttressed a dam, but I have buttressed slides. And it's basically you've got weight and you are supporting the weight with the buttress. It's a method that can work. The buttress material would have to be secure so it wouldn't erode out or loose and have to be towed. I didn't put all that in my comments. But it is a method that could work that would salvage the existing dam, which is – you know, I would think, I don't know

how many millions of dollars it would cost to build another one like that. It does serve a purpose if it can be saved.

Response

Your suggestions have been noted. Buttressing the existing dam is the Proponent's Proposed Project. Although this approach to dam safety is not a project alternative, a range of engineering options to meet the need for dam safety have been evaluated during the development of the project alternatives, considering project feasibility from economic, construction, environmental, and maintenance factors. The alternatives presented in this Final EIR/EIS reflect the options that balance these criteria, meet the project purpose and need, and represent sound engineering solutions **(Also AA-1, AA-6, AA-52, and AA-55)**.

Comment AA-63

Jim Lambert/Carmel River Steelhead Association

Will, also, the reservoir still exist if the dam is rerouted, [will there be] somewhat of a reservoir in the back of the San Clemente Dam? Then when the silt gets moved out, then that reservoir would no longer exist; is that correct?

Response

For Alternatives 2 and 3, the Dam would be removed and the reservoir would no longer exist.

June 27, 2006 letter from Steven A. Hillyard

Comment AA-64

The EIR/EIS considers five alternatives including two that interest me. First, it considers removing slit in preparation for removing the dam. Second, it considers strengthening the dam. Since both are feasible, this means that the dam continues to be a technically viable water storage facility with a current status of being burdened by extensive deferred maintenance. Because the EIS/EIR fails to consider this alternative, it is deficient.

Your agencies can take notice of the fact that the Monterey Peninsula has a very urgent water storage need. Further, you can assume that additional water storage or desalinization facilities will be built to meet this need. The current debate over the desalinations plants planned for Moss Landing is credible evidence of the validity of these assumptions.

There are very significant environmental impacts associated with the alternatives to using San Clemente Dam for meeting at least a portion of the Peninsula's water needs. Those associated with the desalination project, including operational impacts such as

the discharge of green house gasses associated with powering the process, are the most glaring.

Because San Clemente Darn is a viable storage facility, the alternative "uses" that call for it to be taken out of service are burdened with the external environmental impacts associated with replacing its storage capacity. To make an informed decision in the permitting process, decision makers should be informed of these impacts. To facilitate that, the EIS/EIR should consider the rehabilitation alternative. **(Also WAT-13)**

Response

SCD was not originally constructed for water storage, but to provide a point of diversion on the Carmel River and head for gravity feed into the water system. It is not a water storage project. The purpose/objectives and need of the action which the EIR/EIS evaluates is to improve safety, not to alter or improve the water system. Therefore, the EIR/EIS does not consider alternatives for water supply or water storage. Where an alternative affects the operation of the water system, it includes those elements necessary to maintain the essential functions of the water system.

July 3, 2006 letter from Tim Jensen / Monterey Peninsula Regional Park District (MPRPD)

Comment AA-65

Cross-sections, cut-material, and images of road improvements and construction and Site 4R are necessary for adequate environmental review.

Response

A typical road cut section is shown in revised Figure 3.3-5 for the new road to Site 4R. The cut will be made into soil. Road improvements for access to Site 4R are described in Sections 3.3 and 3.4

Comment AA-66

Another example: Figures 3.3.3 and 3.3.4: These figures show the Cachagua/4R Access Route (jeep trail) and Conveyor Route through the Park District's San Clemente Open Space and a large Sediment Disposal site within the property but there is no written description of either in Section 3.2 Proposed Project.

Response

Figures 3.3.3 and 3.3.4 illustrate the access route in Alternative 1 (Dam Notching). The Proponent's Proposed Project would not use any of the routes that transverse MPRPD owned land. Sediment would not be removed or transported under the Proponent's Proposed Project.

Comment AA-67

Figure 3.2.2: This figure shows the Cachagua/4R Access Route (jeep trail) and Conveyor Route through The Park District's San Clemente Open Space and a large Sediment Disposal site within the property but there is no written description of either in Section 3.2 Proposed Project.

Response

Figures 3.2-1 and 3.2-1 show all facilities for all alternatives. The Proponent's Proposed Project would not use any of the routes that transverse MPRPD owned land. No sediment would be removed or transported under the Proponent's Proposed Project. The Cachagua Access Route, including the Jeep Trail and the conveyor route and the sediment disposal site are described in Section 3.3 which discusses Alternative 1 (Dam Notching).

Comment AA-68

3.3 Sediment Transport: The document does not adequately describe the "gravity feed reclaim tunnel system" for conveying the sediment to Site 4R in the park.

Response

Section 3.3.4 in the Final EIR/EIS has been updated to respond to this comment. A gravity feed reclaim tunnel system, typically used in mining applications, would be employed. The system would consist of a buried hopper (a box structure with an opening at the top) which would be installed underneath the excavated sediment stockpile to collect and deposit sediment onto the conveyor system. The conveyor system would be constructed in a tunnel structure (similar to a half round culvert) to protect the conveyor leading to the hopper, and the conveyor equipment.

Comment AA-69

3.3 Sediment Transport: The document does not adequately describe how the road will be used or impacted by expected project use.

Response

Section 4.9.3 of the Final EIR/EIS has been updated to more fully describe these impacts and mitigation measures. The road will be used for mobilization of conveyor equipment, mobilization of heavy earth moving and construction equipment, occasional (bi-weekly) mid-size equipment mobilization, and daily worker access during the construction season. This is an unpaved access road that will be maintained as necessary to provide the construction access described.

Comment AA-70

Exhibit 3.3.5: This exhibit provides little to no value in evaluating the impact of heavy equipment on a narrow, unsurfaced, steep road or any information on necessary road improvements and their impacts to accommodate the expected project uses.

Response

The figure is located in Chapter 3, which comprises the description of the project alternatives, not the evaluation of their impacts. Impacts to roads are discussed in Section 4.9.

Comment AA-71

3.3 Sediment Disposal: The document states that the maximum capacity for sediment disposal at Site 4R Is "'undetermined" but there is no evidence in the document to support the finding that Site 4R can adequately accept the estimated 1.5M CY of sediment material.

Response

Figure 3.3-4 presents an area capacity curve developed from a United States Geological Survey (USGS) topographical map of the area. This figure demonstrates that Site 4R has adequate capacity to hold the sediment volume planned for disposal there. See also Appendix G for further discussion on screening of sediment disposal sites.

Comment AA-72

The document provides a cursory description of Site 4R preparation but is inadequate for proper review as there are no details as to how vegetation "clearing and grubbing will take place, and how and where the "stripping and stockpiling of organic soils" will occur. **(Also TE-35)**

Response

Clearing and grubbing means clearing and rooting of trees, bushes, shrubs, etc. via common mechanical equipment removal methods (e.g., chainsaws, excavators, and bulldozers). Stripping of organic soils would also be achieved via bulldozers and excavators. Stockpiling would occur on the sediment disposal construction site, where the organic soils stockpile footprint would occupy a small area adjacent to construction and sediment placement operations.

Comment AA-73

The document also states "a culvert pipe would likely be placed along the ravine bottom the full length of the site…" For review purposes, this vague language is inadequate. Will or will not a pipe of the scale and scope described be installed? What are the possible environmental impacts if a pipe is or isn't installed? This type of information is not to be found in the document.

Response

A culvert pipe will be placed along the ravine bottom. The culvert pipe is placed for engineering considerations. There would be no additional environmental impacts beyond those described in Section 4.3 of the Final EIR/EIS.

Comment AA-74

The document states that the site will be "winterized" at the end of each construction season but fails to adequately describe the impacts of introducing non-native stabilizing material into the park and any mitigation measures to remove the weeds proposed for introduction. Non-native vegetation is also proposed for introduction to the site for the final topsoil re-placement **(Also TE-11 and TE-36)**

Response

No introduction of non-native plants is proposed in the discussion of "winterizing" or in the final topsoil replacement in Chapter 3. Cut slopes, fill areas, denuded areas, and any other areas where existing vegetation cover would be removed outside the roadway would be revegetated with an appropriate seed mix. This seed mix would be selected with the assistance of a qualified revegetation specialist with demonstrated experience and expertise in revegetation, and would contain native species that are indigenous to the project area. However, native materials are not always available in the quantities needed for a project. The availability of seed can be affected by non-project events that result in a high demand for local native seed. If insufficient native seed is available, non-natives may be included in the seed mix. Such non-native species would be species known not to be invasive or persistent.

Comment AA-75

The document states that there will be 6-inches of Class 2 base-rock imported for the road surface but does not explain what will be done with this material after the project is completed.

Response

At the discretion of the MPRPD, the base-rock will be left in place for improved access along the Jeep Trail. The base-rock along the new access road to the reservoir will be removed at the end of construction when the road will be removed and the pre-construction conditions restored.

Comment AA-76

Project Access and improvements: The document gives a minimal description of the road improvements that does not adequately allow an effective review of potential impacts. This description needs graphic support in the form of pre-project conditions and post-project enhanced conditions. The simple statement that the road will be widened to 20-feet does not adequately describe the scope and scale of the necessary road-cut, where the cut material will be deposited what the road will look like after the

project, or what new maintenance requirements The Park District will inherit if the road improvements are left in or restored upon completion of the project.

Response

Figure 3.3-5 has been updated to show the road cut for the conveyor road and a typical section for road improvements. Along the Jeep Trail, cut material would be used in road widening and excess cut materials would be deposited in the sediment disposal site. The new access road would be restored to pre-construction conditions and the Park District would be consulted on whether they would like to retain improvements to the Jeep Trail after the project is complete. No additional maintenance would be required on the Jeep Trail than already exists.

Comment AA-77

The new ½-mile long access road to Site 4R is similarly described in cursory terms and provides no graphic imagery of pre-project conditions and post-project impacts/conditions. There is also no description of what will become of this road upon project-completion.

Response

See response to Comment AA-76.

Comment AA-78

3.4 Alternative 2: The comments above apply to this alternative as well. The descriptions and graphic support need improvement if an adequate environmental review is to be undertaken. This alternative impacts the Park District to a greater magnitude in that the volume of sediment to be deposited in the park is 2.5M CY.

Response

Road improvements would not vary as a function of the volume of sediment moved and deposited. Please also see response to comment AA-76.

Comment AA-79

3.5 Alternative 3: Though this alternative does not propose Site 4R, it does affect The Park District's road into and through its San Clemente Open Space. The comments above that apply to the road are applicable for this alternative as well.

Response

Please see response to Comment AA-76. It is not clear what effects the MPRPD believes would occur to the road beyond those already documented for the Jeep Trail.

Carmel River Steelhead Association Comments on San Clemente Environmental Impact Report

Comment AA-80

Any sediment storage should be done in as natural a way as possible with the least amount of Geo-grid and concrete, while appreciating the possibility of earthquakes.

Response

Thank you for your comment. Your concerns have been noted. Alternative 3 is designed to assure stabilization using well-known engineering methods and will withstand a MCE. Bioengineered solutions can be considered during final design.

ALTERNATIVES SUPPORTED / OPPOSED

WRITTEN COMMENTS RECEIVED

May 24, 2006 letter from Don Redgwick

Comment AL-1

I favor salvaging the San Clemente Dam with a buttress.

Response

Thank you for your comment in support of the Proponent's Proposed Project.

June 1, 2006 letter from Dougald Scott, Northern California Council of the Federation of Fly Fishers / Santa Cruz Fly Fishermen

Comment AL-2

Northern California Council of the Federation of Fly Fishers supports ALTERNATIVE 3: CARMEL RIVER REROUTE AND DAM REMOVAL

Response

Thank you for your comment in support of Alternative 3.

Comment AL-3

- *In support of ALTERNATIVE 3:*
- *It would permanently eliminate safety concerns through the removal of the dam.*
- *It would permanently eliminate the fish passage barrier.*
- *It would permanently minimize temperature increases during passage through the reservoir site.*
- *It would require a minimum of sediment removal, and not require long distance transport of the sediment. Under this alternative, sediment need only be transported a short distance from the San Clemente arm to the Carmel River arm.*
- *Sluicing and downstream sedimentation problems are eliminated.*
- *Compared to the other ALTERNATIVES, negative impacts are generally short-lived and corrected with mitigation measures.*

Response

Thank you for your comment in support of Alternative 3. Your concerns have been noted.

Comment AL-4

Against the PROPOSED PROJECT and ALTERNATIVE 1

- *Both will require continued sluicing to keep the fish ladder operational. This will result in the transport of significant amounts of accumulated sediment down the river channel. The increase in suspended and bedload sediment delivered to the lower river would impair aquatic habitat and directly affect redds and juvenile and adult steelhead in the river.*
- *Both will require a fish ladder for fish passage.*
- *ALTERNATIVE 1 would require extensive sediment removal and transport over a relatively long distance.*

Response

Thank you for your comment opposing the Proponent's Proposed Project and Alternative 1. Your concerns have been noted. Sediment impacts for these two alternatives are evaluated primarily in Sections 4.2 and 4.4. The revised Sediment Operations and Management Plan for Fish Passage (SOMP) is in Appendix J.

Comment AL-5

Against ALTERNATIVE 2

- *It would require massive sediment removal and transport over a relatively long distance.*

Response

Thank you for your comment opposing Alternative 2.

June 4, 2006 letter from Don Redgwick

Comment AL-6

I believe strengthening the San Clemente Dam is the logical course of action for all of the issues I have addressed and the proposal to eliminate the dam is the worst idea in all counts except a possible advantage to ocean fish.

Response

Thank you for your comment in support of the Proponent's Proposed Project.

Undated letter from Claude Rosenthal

Comment AL-7

I am writing to urge you to stop the plan to buttress the San Clemente Dam on the Carmel River. The dam has been deadly to migrating fish and adds little value to downstream users. . In fact, I urge you to plan for the removal of this dam, ASAP.

Response

Thank you for your comment opposing the Proponent's Proposed Project. Your concerns have been noted. The existing dam is part of the baseline environmental condition for the project. It is not an impact of the project.

June 15, 2006 letter from Pam Krone-Davis, Rising Leaf Watershed Arts

Comment AL-8

We are in favor of the alternative for the River reroute and the stabilization of the sediment.

Response

Thank you for your comment in support of Alternative 3.

June 14, 2006 letter from Linda Agerbak

Comment AL-9

I opt for Alternative 3: Carmel River reroute, dam removal, and sediment stabilization, because it's a cost-effective, permanent, environmentally beneficial solution:

- *It permanently removes the risk of dam failure.*
- *By restoring the San Clemente Creek bed, it restores the river channel to a geologically stable pattern.*
- *It allows the fish free-flowing passage upstream and downstream.*
- *It limits the release of sediment downstream through the use of 2650 feet of the Carmel River bed to store the accumulated sediment.*
- *No need for massive movement of sediment by truck or conveyor belt.*
- *It limits short-term turbidity.*
- *It avoids the concrete batch plant operation.*

Response

Thank you for your comment in support of Alternative 3. Your concerns have been noted.

June 30, 2006 letter from Dick Butler, National Marine Fisheries Service (NMFS)

Comment AL-10

Our enclosed comments and detailed involvement since 2000 have provided the Corps the assistance necessary to develop and determine environmentally preferable alternatives. As stated in our April 5, 2006, letter, NMFS believes the use of sluice gates as proposed in the Proponent's Proposed Project and Alternative 1 is a fatal project

flaw. The Draft EIR/EIS notes San Clemente Dam and Reservoir were never intended for flood control and the San Clemente Dam Seismic Safety Project has neither flood storage nor flood operations criteria. The Draft EIR/EIS also notes San Clemente Reservoir does not provide water storage for the California American Water Company system and the Proponent's Proposed Project will not improve current or future water storage. A dam and reservoir that provides neither flood storage nor water storage, commensurate with the long-term adverse environmental impacts associated with operating and maintaining the dam, make it clear to NMFS that Alternative 2 (dam removal) or Alternative 3 (Carmel River reroute and dam removal) are the environmentally preferable alternatives. Implementation of the Proponent's Proposed Project or Alternative 1 will likely jeopardize S-CCC DPS steelhead and destroy designated critical habitat of S-CCC DPS.

Response

Thank you for your comment. Your concerns regarding the alternatives have been noted. The existing dam is part of the baseline environmental condition for the project. It is not an impact of the project. The Dam continues to serve its intended function as a point of diversion for CAW.

April 5, 2006 letter from Dick Butler, National Marine Fisheries Service (NMFS)

Comment AL-11

NMFS believes the use of sluice gates constitutes the fatal flaw in the Proponent's Preferred Project (buttressing) and Alternative 1 (notching). Based on the information NMFS has reviewed, NMFS believes the sluice gates will likely lead to the extirpation of an anadromous steelhead run in the Carmel River, which is the largest remaining run of anadromous steelhead in the S-CCC distinct population segment. NMFS, as stated many times over the past 6 years, recommends no further consideration of alternatives that include sluicing. We strongly encourage the DWR to fully consider our recommendations and move forward to address the seismic safety of the San Clemente Dam.

Response

Thank you for your comment. Your concerns have been noted. The EIR/EIS has been updated to provide a more in-depth analysis of sediment management; please refer to Sections 4.2 and 4.4 in particular. NEPA (National Environmental Policy Act) and CEQA (California Environmental Quality Act) require consideration of a reasonable range of alternatives; for this project, these include alternatives which entail sediment management techniques, such as sluicing.

June 30, 2006 letter from Patricia Sanderson Port, U.S. Fish and Wildlife Service

Comment AL-12

The Department commends the Corps' inclusion of two alternatives (Alternatives 2 and 3) that would return the reach of the Carmel River in the project area to a natural, free-flowing state. Free-flowing reaches of the Carmel River upstream and downstream of the project area meander seasonally, and periodically create off-channel pools and backwater areas. These features support high-quality breeding habitat for the federally threatened California red-legged frog (Rana aurora draytonii), and the Department finds that returning the project area to a free-flowing state would enable this reach of the Carmel River to eventually function similarly for the subspecies.

Response

Thank you for your comment in support of the dam removal alternatives (Alternatives 2 and 3).

Comment AL-13

The Department has several concerns regarding implementation of the proposed project (i.e., dam thickening). Specifically, our concerns relate to: fortification of a structure that is likely to pose a barrier to dispersal of individual California red-legged frogs; construction and operation of a concrete batch plant adjacent to the Carmel River where accidental spills and increased sedimentation could have far-reaching adverse effects to aquatic habitats that support the California red-legged frog; construction of a new, redundant access road through an undisturbed riparian area that supports the California red-legged frog; and long-term degradation of habitat for the California red-legged frog.

Response

The existing dam is part of the baseline environmental condition for the project. It is not an impact of the project. Impacts to the California red-legged frog are discussed in Section 4.5 (Vegetation and Wildlife) and are noted throughout Chapter 4. Potential impacts of the batch plant are discussed throughout Chapter 4, particularly in Sections 4.7 (Air Quality), 4.8 (Noise), and 4.11 (Aesthetics) as well as in Appendix R. Potential impacts associated with access road construction are addressed throughout Chapter 4.

July 3, 2006 letter from Robert W. Floerke, California Department of Fish and Game

Comment AL-14

Our comments focus primarily on our concerns with the proponent's intent to repair the obsolete San Clemente Dam (Dam) and maintain the structure as a permanent impediment to natural fluvial processes and fish movement in the Carmel River watershed. We also describe the advantages of the fundamental opportunity still

available to the project proponent to greatly improve this watershed by implementing what we deem to be the environmentally preferred option, Alternative 3, the Carmel River reroute with in-place sediment stabilization. The proponent's proposed project is currently dam strengthening with in-place sediment stabilization. The impetus for the project is the requirement by the Division of Dam Safety (DSOD), which has been in place since 1995, for the Coastal Division of the California American Water Company (CAW) to bring the Dam into compliance with safety standards based on predictions of a Maximum Credible Earthquake (MCE) and a Probable Maximum Flood (PMF). It is important to note for the record that the dam no longer has any functional purpose in terms of traditional uses such as water storage or flood control, and that no assertions about such utility in the future are being made.

Response

Thank you for your comment. Your concerns have been noted. The Dam has never served to provide water storage or flood control; it continues to serve its intended function as a point of diversion for California American Water (CAW). As a result of CEQA review, the state of California, through the California Coastal Conservancy, has taken a preliminary interest in funding the Carmel River Reroute and Dam Removal (Alternative 3) project under a scenario in which CAW would turn over the project and property surrounding the Dam to a non-profit or governmental entity plus contribute a share of the funding. The Department of Water Resources (DWR) has given the parties until December 30, 2007 to determine whether this is a viable option.

COMMENTS RECEIVED AT MAY 23, 2006 PUBLIC HEARING

Jonas Minton, Planning and Conservation League Environmental Advocacy Organization:

Comment AL-15

A major acknowledged problem with the dam strengthening and notching as identified on page 51 is, quote, significant and unavoidable impacts to water quality, significant and unavoidable impacts to fish. Those are impacts with both the strengthening and the notching. For those reasons, it appears to us that the viable alternative is the river rerouting and dam removal option, and it is our view after reading the entire EIR/EIS that that is in fact the least environmentally damaging project alternative, which the Corps, of course, is required to identify under Section 404(b)(1) of the Clean Water Act. And we also believe that that is the most environmentally, economically and socially response alternative. Instead of dealing with this as a problem that has to be cemented in or hacked half way down, we think that it's possible to have a bigger solution.

Response

Thank you for your comment in support of Alternative 3. Your concerns have been noted. All of the action alternatives have impacts that are significant and unavoidable.

William Look, California Trout

Comment AL-16

Based on what I've seen so far, however, it seems to me that as long as the entombment of the gravel can be done in a way which provides a long-term solution and not one that just defers 50 or 60 years -- and that might be the preferred alternative in that it provides probably the least risk to the public and least disruption of the homes in the area as well as provides what in the end would be a more natural fish passage, so long as in the end you haven't created yet another barrier where the dam was.

Response

Thank you for your comment. Your concerns have been noted.

Hannah Schoenthal-Muse, Friends of the River

Comment AL-17

Straight to the point. We think that the reroute and dam removal alternative is the most appropriate option of all. Not only will it help improve the overall health of the Carmel River, we think it will protect the viability of California's important coastal steelhead stream. So that's where we stand, and thanks for having us.

Response

Thank you for your comment in support of Alternative 3.

Roger Williams, Resident of Carmel-by-the-Sea

Comment AL-18

I like the last alternative. I was really impressed with the idea of the river rerouting. The strengthening and notching of the dam don't do anything for the steelhead, or not much other than improving the fish ladder. Yet the notching has the advantage of doing a whole lot of good for at least that population of the wildlife.

Response

Thank you for your comment in support of Alternative 3.

Don Redgwick, Resident of Pacific Grove

Comment AL-19

I think the report and recommendation should take into consideration the environment, preservation, conservation, water resources and economics of the project. The solution to all five of these goals is to save the existing dam by reinforcing. The sediment should be moved from the back of the dam to the front of the dam and placed as a buttress. I think that follows a little bit with your wasting the sediment in the old channel line.

Response

Thank you for your comment in support of the Proponent's Proposed Project. Your concerns have been noted.

Clive Sanders, Carmel River Watershed Conservancy

Comment AL-20

I think the only alternative you are giving us is movement, the changing of the route of the Carmel River. Now I'm a guy who has been against putting a dam down all these 15 years. I have become educated with the help of a few friends, and I think that's the way to go.

Response

Thank you for your comment in support of Alternative 3.

Hank Smith, Resident of Monterey

Comment AL-21

I support Alternative number 3 for the following reasons. The dam no longer fulfills its intended, original purpose because of the sediment behind it. The disruption and costs of silt removal are obviously not acceptable. Spending money to buttress a worthless water storage tool escapes my notion of common sense.

Response

Thank you for your comment in support of Alternative 3. SCD was never intended to be a water storage facility but it still continues to serve its intended function as a point of diversion for CAW.

Your concerns have been noted.

Frank Emerson, Carmel River Steelhead Association:

Comment AL-22

The first two options, the strengthening and the notching only solved one of a number of problems, and that is simply the dam safety issue. Neither option provides any more water storage, actually both do not provide any water storage, as well as flood control. So even as Dave was pointing out, if those dams were restored back to their original condition, they still won't provide flood control because they don't store enough water. They quickly fill up and water passes over them.

So to me the biggest bang for the buck is the reroute and removal options, because it addresses not only the dam safety issue, but it restores a critically important reach of spawning habitat. It restores the ability of fish to pass freely, downstream migration of juvenile fish, adult fish, upstream migration of adult fish, restores an area to its previous

condition. Dave was saying something like two miles of that river has now been inundated by sediment, so that's two miles of riverbed that could be restored. We have an historic opportunity not usually seen in California. And if there was ever a dam that was crying out to be removed, it's the San Clemente Dam. It provides so little benefit and actually remains a hazard, remains a public nuisance if we go with Option 1 or 2. So, again, thank you for all the hard work you did on the presentations, and we'd like to be on record as supporting Option 4. Thank you.

Response

Thank you for your comment in support of Alternative 3. Your concerns have been noted. SCD was not originally constructed for water storage or flood control and has never served those purposes but the Dam would continue to function as a point of diversion for the CAW water system.

Rex Keyes, Resident of Salinas

Comment AL-23

I'm in favor of restoring the dam to its original operation like it was about 50 years ago.

Response

Thank you for your comment. The Dam continues to serve its original function as a point of diversion for the CAW water system.

Nikki Nedeff, Resident of Carmel Valley

Comment AL-24

The reroute option is the most preferable in terms of the impact potentially for the environment.

Response

Thank you for your comment in support of Alternative 3.

Jessica Simms, Resident of Carmel Valley

Comment AL-25

I also support the removal of the dam and the rerouting. It seems to be, of the options discussed, the most economical and sustainable with the least environment implications to the steelhead, the plant species and the air quality due to trucking enormous amount of truckloads of concrete away.

Response

Thank you for your comment in support of Alternative 3.

Keith Vandevere, Resident of Carmel Valley

Comment AL-26

I do very much the support the alternative, I guess it's Alternative 3, the reroute and dam removal alternative. I think it's clearly the environmentally preferable alternative, environmentally superior alternative in this case from my reading of the EIR/EIS.

Response

Thank you for your comment in support of Alternative 3.

June 30, 2006 letter from Clive R. Sanders, Carmel River Watershed Conservancy

Comment AL-27

We urge you to select Alternative 3, river reroute and dam removal, as the preferred project to ensure the long-term safety of the residents of the Carmel River Valley as well as the continued protection and improvement of the environment that provides critical habitat for the "threatened" steelhead and California red-legged frog.

Response

Thank you for your comment in support of Alternative 3. Your concerns have been noted.

June 28, 2006 letter from Jim Crenshaw, California Sportfishing Protection Alliance

Comment AL-28

We urge you to select Alternative 3, river reroute and dam removal, as the preferred project to ensure the long-term safety of the residents of the Carmel River Valley as well as the continued protection and improvement of the environment that provides critical habitat for the "threatened" steelhead and California red-legged frog.

Response

Thank you for your comment in support of Alternative 3. Your concerns have been noted. All alternatives meet the need of meeting current safety standards with respect to a Maximum Credible Earthquake (MCE) and Probable Maximum Flood (PMF).

Comment AL-29

We also find that leaving the dam structure in place (Proponent's Proposed Project, dam thickening, and Alternative 1, dam notching) will result in significant and ongoing impacts to the environment and will not resolve the safety issue, but only prolong the burden on the ratepayers of maintaining and ultimately removing the structure at some point in the future.

Response

Thank you for your comment raising concerns regarding the Proponent's Proposed Project and Alternative 1. The Proponent's Proposed Project and Alternative 1 meet the need of meeting current safety standards with respect to the MCE and PMF.

Comment AL-30

The fish ladder design and the flawed sluice gate design would most probably result in a Jeopardy Opinion under the Endangered Species Act. This will delay the start of a project indefinitely. For these reasons, it is clear that Alternative 3 is the most viable and expedient alternative that will assure the long-term safety of the residents of the Carmel River Valley.

Response

Thank you for your comment in support of Alternative 3. Your concerns have been noted.

Comment AL-31

We find that this DEIR/S is adequate if and only if the Lead Agencies select Alternative 3 as the preferred alternative for the following reasons:

First, Alternative 3 should be the preferred alternative in the Final EIR/S because it is the best technical design and most expedient solution that assures the safety issues are resolved permanently.

Second, the Proponent's Proposed Project, dam thickening, runs the risk of drastic unintended consequences and will continue to compromise safety in the future as the dam structure continues to degrade over time, and will also result in cumulative impacts to the environment under the Endangered Species Act, the Clean Water Act, the Porter Cologne Water Quality Act, NEPA and CEQA. It would also most probably result in a Jeopardy Opinion by NOAA Fisheries and USFWS (Section 7 Consultation) delaying the project.

Third, the river reroute and dam removal alternative provides a technically superior and viable solution in a shorter time frame than either notching or dam thickening, assuring that the risk to human life and impacts to federally designated "threatened" species are reduced or completely eliminated as soon as possible.

Fourth, the public has clearly voiced its support for the river rerouting and dam removal alternative as demonstrated by public comments at the DWR/USACOE public hearing for the Draft EIR/EIS held in Camel Valley on May 23rd and reported in the media (see attachment, front page article "Carmel River reroute gets solid backing", Monterey Herald, May 24,2006).

CSPA supports selection of Alternative 3, river reroute and dam removal, as the preferred alternative because it is the only one that guarantees a final solution for long-term safety and also protects the environment and reduces adverse impacts to water quality, and "threatened" steelhead and California red-legged frog.

Response

Thank you for your comment in support of Alternative 3. The Proponent's Proposed Project and all of the action alternatives satisfy current safety standards with respect to the MCE and PMF. Based on equal scheduling assumptions, the Proponent's Proposed Project would have the shortest implementation schedule. It is uncertain whether any of the action alternatives would result in issuance of a jeopardy opinion, however, any decision may be challenged and it is not possible to forecast with confidence how such conjectural challenges would affect project implementation schedules. Your comments regarding other alternatives have been noted.

Comment AL-32

CSPA will actively support the selection and implementation of Alternative 3, and will also continue to advocate for support by interested groups in the community and throughout the state for implementation of Alternative 3.

Response

Thank you for your comment in support of Alternative 3.

Undated Carmel River Steelhead Association Comments on San Clemente Environmental Impact Report

Comment AL-33

San Clemente Dam must be completely removed. Any options involving sluice gates and fish ladders will "take" (death of a critical part of the population hindering recovery leading to further decline and toward extinction) of steelhead. The long term costs, i.e. forever of operation, maintenance, management and liability of a semi-abandoned dam are huge. The risk of earthquakes and flood liability still remain. The only civilized and sane option is complete removal.

Response

Thank you for your comment in support of dam removal. Your concerns have been noted. Costs of operation and maintenance are presented in Section 3.1, Table 3.1-1, and are not a large component of total project cost. The Proponent's Proposed Project and Alternative 1 both meet the need of meeting current safety standards with respect to the MCE and PMF. San Clemente Dam is (SCD) not "semi-abandoned" and still fulfills its original purpose of providing a point of diversion for CAW.

July 12, 2006 email from Bob Baiocchi, Carmel River Steelhead Association

Comment AL-34

The best solution and most reasonable alternative is to have the dam removed because it is useless, the fish ladder does not work, the reservoir is filled with sediment and the dam is an obstruction to navigation and steelhead migration in the river. You don't abandon a defective automobile in the middle of a public freeway to satisfy local political reasons. See attachment. Have it removed. Thank you.

Response

Thank you for your comment in support of dam removal. The Dam continues to serve its intended function as a point of diversion for CAW.

June 28, 2006 letter from Bob Baiocchi, Carmel River Steelhead Association

Comment AL-35

One of the most reasonable alternatives that should have been included in the draft EIR/EIS under CEQA is the removal of San Clemente Dam because the dam is an obstruction to the navigable waters of the Carmel River.

Response

Thank you for your comment. Dam removal is evaluated under Alternatives 2 and 3.

June 30, 2006 letter from Mindy McIntyre, Planning and Conservation League Foundation

Comment AL-36

We urge you to select Alternative 3, dam removal and river reroute, as the preferred project to ensure the long-term safety of the residents of the Carmel River Valley as well as the continued protection and improvement of the environment that provides critical habitat for the "threatened" steelhead trout and California red-legged frog.

Response

Thank you for your comment in support of Alternative 3. Your concerns have been noted. All alternatives meet the need of meeting current safety standards with respect to the MCE and PMF. As a result of CEQA review, the state of California, through the California Coastal Conservancy, has taken a preliminary interest in funding the Carmel River Reroute and Dam Removal (Alternative 3) project under a scenario in which CAW would turn over the project and property surrounding the Dam to a non-profit or governmental entity plus contribute a share of the funding.

Comment AL-37

We also find that leaving the dam structure in place (the "Proponents Proposed Project," dam thickening, and Alternative 1, dam notching) will result in significant and ongoing impacts to the environment and will not resolve the safety issue adequately. It will, moreover, burden the ratepayers with the cost of maintaining and ultimately removing the structure at some point in the future.

Response

Thank you for your comment. The Proponent's Proposed Project meets the need of meeting current safety standards with respect to the MCE and PMF. It would not lead to a need for dam removal at a later time.

Comment AL-38

We believe that the fish ladder design and the flawed sluice gate design will result in a Jeopardy Opinion that will delay the start of a project indefinitely. For these reasons, it is clear that "Alternative 3" is the most viable and expedient alternative that will assure the long-term safety of the residents of the Carmel River Valley. It is also the least environmentally damaging, and therefore will move forward and expedite implementation of a project that will permanently remove the risk of dam failure associated with both MCE and PMF conditions as required by law.

Response

Thank you for your comment in support of Alternative 3. Based on equal scheduling assumptions, the Proponent's Proposed Project would have the shortest implementation schedule. It is uncertain whether any of the action alternatives would result in issuance of a jeopardy opinion, however, any decision may be challenged and it is not possible to forecast with confidence how such conjectural challenges would affect project implementation schedules. The Proponent's Proposed Project and all of the action alternatives would satisfy current safety standards with respect to the MCE and PMF. As a result of CEQA review the state of California, through the California Coastal Conservancy, has taken a preliminary interest in funding the Carmel River Reroute and Dam Removal (Alternative 3) project under a scenario in which CAW would turn over the project and property surrounding the Dam to a non-profit or governmental entity plus contribute a share of the funding.

Comment AL-39

We find that this DEIR/S is adequate if and only if the Lead Agencies select Alternative 3 as the preferred alternative for the following reasons:

First, "Alternative 3" should be the preferred alternative in the Final EIR/S because it is the best technical design and most expedient solution that assures the permanent resolution of safety issues.

Second, the Proponent's Proposed Project, dam thickening, runs the risk of drastic unintended consequences and will continue to compromise safety in the future as the dam structure continues to degrade over time, ultimately resulting in greater costs to the ratepayers. These include the cost of the current Proponent's Proposed Project, which provides a short-term solution at best, involving ongoing maintenance, operating and fish passage costs, and again in the future when the aging structure reaches the end of its life span. The Proponents Proposed Project also results in cumulative impacts to the environment under the Endangered Species Act, the Clean Water Act and the Porter Cologne Water Quality Control Act that will counter NEPA-CEQA criteria that may result in a Jeopardy Opinion by NOAA Fisheries and USFWS (Section 7 Consultation) delaying the project indefinitely.

Third, the dam removal option and river reroute provides a technically superior and viable solution in a shorter time frame than either notching or dam thickening, assuring that the risk to human life and impacts to federally designated "threatened" species are reduced or completely eliminated as soon as possible.

Fourth, the public has clearly voiced its support for dam removal and river rerouting as demonstrated by public comments at the DWR/USACE public hearing for the Draft EIR/EIS held in Camel Valley on May 23rd and reported in the media (see attachment, "Carmel River Reroute Gets Solid Backing," Monterey Herald, May 24,2006).

PCLF supports selection of Alternative 3, dam removal and river reroute as the preferred alternative because it is the only one that guarantees long-term safety, protects the environment, reduces adverse impacts to water quality, and preserves "threatened" steelhead and California red-legged frog. Furthermore, we find that the Draft EIR/EIS fails to fully assess the impacts of California American Water's preferred alternative, dam thickening, Alternative 1 (dam notching) or Alternative 2 (dam removal and transport of sediment to a nearby canyon), and therefore the Draft EIR/S is inadequate for assessing any of the other alternatives.

We strongly urge DWR and USACE to consider public input and support for Alternative 3, and based upon the reasons cited above, select river reroute and dam removal as the technically superior design for a project that will permanently resolve the dam safety risk. PCLF will actively support the selection and implementation of Alternative 3, and will also continue to advocate for support by interested groups in the community and throughout the state for implementation of Alternative 3.

Response

Thank you for your comment in support of Alternative 3. Your concerns have been noted.

The adequacy of an EIR/EIS depends upon its compliance with the NEPA and CEQA regulations, not upon the selection of a particular alternative.

The costs of the Proponent's Proposed Project are summarized in Section 3.1, Table 3.1-1; the Proponent's Proposed Project would be the most cost-effective of the alternatives considered. Further requirements to stabilize the Dam at some unknown future date are not expected.

Based on equal scheduling assumptions, the Proponent's Proposed Project would have the shortest implementation schedule. It is uncertain whether any of the action alternatives would result in issuance of a jeopardy opinion, however, any decision may be challenged and it is not possible to forecast with confidence how such conjectural challenges would affect project implementation schedules. The Proponent's Proposed Project and all of the action alternatives would satisfy current safety standards with respect to the MCE and PMF.

The comment regarding cumulative impacts of the Proponent's Proposed Project is not clear enough to provide a response. The comment is also not clear in what respect the impacts of the Proponent's Proposed Project and Alternatives 1 and 2 have not been fully assessed. As a result of CEQA review, the state of California, through the California Coastal Conservancy, has taken a preliminary interest in funding the Carmel River Reroute and Dam Removal (Alternative 3) project under a scenario in which CAW would turn over the project and property surrounding the Dam to a non-profit or governmental entity plus contribute a share of the funding.

Comment AL-40

Selecting Alternative 3 would ensure that the federal government does not issue a Jeopardy Opinion under the Endangered Species Act, which would further delay resolution of the dam safety deficiencies.

Response

Thank you for your comment. It is uncertain whether any of the action alternatives would result in issuance of a jeopardy opinion, however, any decision may be challenged and it is not possible to forecast with confidence how such conjectural challenges would affect project implementation schedules. The selection of Alternative 3 does not ensure the outcome of Endangered Species Act (ESA) consultation.

Comment AL-41

Lastly, Alternative 1 discussed in the DEIR/S, notching the dam to a lower level and creating sluice gates, fundamentally has the same problems as the dam thickening. Both leave a potentially unstable structure, and both use sluicing, which has foreseeable difficulties discussed below. There are, moreover, water quality issues resulting from continuous release of sediment, primarily silt, that can result in increased turbidity that are essentially the same with both and which are not assess in the DEIR/S. Both the proponent's Proposed Plan and Alternative 1 will have rising cumulative costs into the future associated with maintaining an aging structure, possibly needing modifications to address flaws in the technical design in the structural work over the

decades projected for maintain the structure in the future. Neither is a permanent solution to the unsafe nature of the San Clemente Dam and will result in enormous ongoing costs to the ratepayers.

Response

Thank you for your comment. Your concerns have been noted. The Dam would not be unstable under either Alternative 1 or the Proponent's Proposed Project; both meet the need for dam safety. The effects of sediment sluicing, including water quality effects, are updated throughout Chapter 4 of the Final EIR/EIS. The costs of ongoing operation and maintenance are included in Section 3.1, Table 3.1-1. Whether the Proponent's Proposed Project or one of the action alternatives is implemented, future expenditures to address flaws in technical design and structural work are not expected to be required.

Comment AL-42

Alternative 1, CAW's preferred alternative, has many far-reaching consequences that are not covered in the draft EIR/S, and would need to be addressed before choosing that alternative.

It is likely, in our professional estimation, that simply buttressing the dam will have cumulative impacts. A primary impact is one that results from impacts to water quality resulting from the release of unknown levels of sediment, primarily silt, as the primary method to reduce the rate of build-up of sediment behind the dam structure. It is also likely that scouring patterns evident downstream of the dam site will also continue to occur, impacting fish habitat.

Response

Thank you for your comment. Alternative 1 (Dam Notching) is not the proponent's proposed or preferred project. Cumulative impacts are addressed in Section 5.3 of the Final EIR/EIS. The effects of sediment sluicing, including water quality effects, are updated throughout Chapter 4 of this Final EIR/EIS.

Comment AL-43

It is clear that the public supports Alternative 3. A Monterey County Herald headline states, "Carmel River Reroute Gets Solid Backing," and goes on to state, "A proposal to rechannel the Carmel River upstream from San Clemente Dam... got strong public support Tuesday night at a hearing held by state and federal officials at Rancho Canada Golf Club" (the article is attached). At this well-publicized meeting, 22 people spoke in favor of the reroute with only three opposing. The public's wishes should be able to determine how they want to deal with a dam that is literally in its backyard. The reasons stated for supporting reroute and restoring normal flows and sediment levels to the lower river basin ranged from desiring to improve public recreation (kayaking and hiking), wishing to see the river and health of wildlife recover, wanting to see traditional benefits to the community regained through improved river conditions, and recognizing

that buttressing is only a "band-aid" solution that assures future costs and an ongoing burden for the rate payers.

Strong public support is crucial to staging a successful project. DWR and USACE should take the broad public support for Alternative 3 into careful consideration when selecting a preferred alternative.

Response

Thank you for your comment in support of Alternative 3. Your concerns have been noted.

Comment AL-44

The San Clemente Dam as it is today is a dam that is unsafe for both a large-scale earthquake and large-scale flood. The DSOD has made it clear for over a decade that the dam cannot remain in its current state and CalAm must alter or remove it to guarantee human safety. The only option that would make the draft EIR/S on the San Clemente Dam adequate is Alternative 3, dam removal/river reroute. With broad public support for this option, it is clear that the residents affected by these proposals, the ones who will have to shoulder any rate increases, support the removal of the dam and the river reroute. The dam removal and river reroute option is the only one that: guarantees the safety of the Carmel River Valley region in the case of an earthquake or major flood; adequately protects the several endangered species and recovery of critical habitat in the valley; ensures other benefits are protected including water quality standards.

We support the DEIR/S in its current form and urge its adequate completion by selecting Alternative 3 as the preferred alternative.

Response

Thank you for your comment in support of Alternative 3. Your concerns have been noted. The adequacy of an EIR/EIS depends upon its compliance with the NEPA and CEQA regulations, not upon the selection of a particular alternative.

PROJECT COST/EFFECTS ON WATER RATES

WRITTEN COMMENTS RECEIVED

May 24, 2006 letter from Don Redgwick

Comment CR-1

The demolition of the dam will be very costly and will ultimately be paid by the consumers or taxpayers. Court costs may be involved in some proposals being discussed.

Response

Thank you for your comment. Project objectives include minimizing financial impacts to California American Water (CAW) ratepayers. Court costs and the cost of associated delays are conjectural and are not included in project cost estimates. Please refer to Section 3.1 and Table 3.1-1 of the Final EIR/EIS for a summary of comparative costs for the alternatives considered.

May 25, 2006 letter from Anthony G. Davi, Sr.

Comment CR-2

I recognize that the cost of retrofitting will be high. However, if the river is diverted, silt removed, fishes and frogs protected and ultimately the dam is removed, we the rate payers will foot the bill by increased rates to pay for the aforesaid without the benefit of any improvement in our water supply.

Response

Thank you for your comment. The Carmel River would only be rerouted under Alternative 3 (Carmel River Reroute and Dam Removal). Project objectives include minimizing financial impacts to CAW ratepayers.

June 30, 2006 letter from Trish Chapman/California Coastal Conservancy

Comment CR-3

Section 1.4 Project Purpose, Need and Objectives. The fourth stated objective of the project is to "minimize financial impacts to CAW rate payers". The EIR/EIS should provide cost estimates for each of the alternatives, including the costs of ongoing maintenance. Without this information, the alternatives can not be assessed in regards to this objective.

Response

Please refer to Section 3.1 and Table 3.1-1 of the Final EIR/EIS for a summary of comparative costs for the alternatives considered.

June 22, 2006 letter from David Zaches

Comment CR-4

Mindful of CalAm's obligations to safety-retrofit or demolish the dam, when RWE, bought CalAm, they certainly did their due diligence, and knew full well of the dam's structural problems. The estimated costs of dam safety work were surely subtracted from the price RWE offered CalAm, and therefore the costs should be borne by CalAm and RWE, and not by the ratepayers.

Response

Thank you for your comment. The National Environmental Protection Act (NEPA) and the California Environmental Quality Act (CEQA) do not dispose obligations to pay project costs. However, project objectives include minimizing financial impacts to CAW ratepayers.

July 3, 2006 letter from Robert W. Floerke / Department of Fish and Game

Comment CR-5

Finally, DFG hopes that the CEQA and NEPA Lead Agencies have fully and responsibly considered the fact that the cost differential between the proposed project and removal alternatives, in particular Alternative 3, may not have to be fully borne by CAW. We hope that an economically based statement of overriding considerations will not be considered until a thorough review of potential and existing funding sources occurs. Resource agencies are well aware of the historic opportunity to restore a significant portion of the Carmel River watershed, and it is highly likely that they can assist CAW identifying funding support to offset the additional cost for dam removal. For its part, DFG understands DWR's interest in eliminating the risk to the public in a timely manner, and would be willing to assist within its means to facilitate efforts for obtaining funds without jeopardizing project momentum. We would also recommend that CAW note that DFG administers a Fisheries Restoration Grant Program (FRGP), and that a dam removal project of this nature would be eligible for funding (although it should be noted that FRGP grants are typically not large enough to cover more than a portion of the overall expense of a project of this scope). Perhaps more significantly, DFG provides input to other funding bodies, and could be counted on for support if and when dam removal becomes an option. The next deadline for FRGP grant proposals is in March 2007 for funds to be disbursed in 2008. We would also consider providing technical support for reducing any remaining uncertainties with finalizing designs for dam removal and or river re-route.

Response

Please refer to Section 3.1 and Table 3.1-1 of the Final EIR/EIS for a summary of comparative costs for the alternatives considered. Funding strategies for Alternative 3

are being thoroughly explored by CAW. Thank you for your advice and for your offers of technical support and of assistance in identifying funding.

NOTE: COMMENTS CR-6 THROUGH CR-10 CORRESPOND TO MAY 23, 2006 PUBLIC HEARING TESTIMONY COMMENTS

Comment CR-6

Don Redgwick/Resident of Pacific Grove

Demolition of the dam will result in a very costly cost to the taxpayers or the consumers, and it probably might involve some court costs along with it without a reasonable solution.

Response

Comment noted. Project objectives include minimizing financial impacts to CAW ratepayers. Please refer to Section 3.1 and Table 3.1-1 of this Final EIR/EIS for a summary of comparative costs for the alternatives considered. Court costs and the cost of associated delays are conjectural and are not included in project cost estimates.

Comment CR-7

Clive Sanders/Carmel River Watershed Conservancy

I think we need to understand a little bit better that the cost of this cannot be borne by the owner. Now the owner happens to be Cal Am, but the people who are paying for it are we. We are the people that are going to be paying for it. If we're going to have a major demolition of the dam at the level you are suggesting, then we need federal help. Now I believe there are groups of people that are working on this. I think this has to be published, and I think in your final report you need to zero in on this aspect.

Response

Comment noted. Project objectives include minimizing financial impacts to CAW ratepayers. Please refer to Section 3.1 and Table 3.1-1 of this Final EIR/EIS for a summary of comparative costs for the alternatives considered. Funding strategies are being thoroughly explored by CAW.

Comment CR-8

Steve Wilpert/Resident of Sleepy Hollow

We're spending our tax dollars; that is, Cal Am is spending its energy. I suggest leave them alone. And Cal Am is being forced to spend their customers' money a hell of a lot on a project that means so little in terms of the whole community.

Response

Comment noted. Project objectives include minimizing financial impacts to CAW ratepayers.

Comment CR-9

Roy Thomas/Carmel River Steelhead Association

It's going to cost lots and lots of money. And I propose that the company put up a bond, maybe 50, maybe $75 million for the next 150 years of maintenance on the fish ladder and the dam.

Response

Comment noted. Project objectives include minimizing financial impacts to CAW ratepayers. Funding for operation and maintenance of the dam, fish ladder and sluice gate would be provided through the normal budgetary process of the owner and paid by the revenues of the water system, as regulated by the CPUC. A bond would not be necessary to maintain the fish ladder and dam.

Comment CR-10

Serge Glushkoff/California Department of Fish and Game

Curiously, on the economic potentials of the project, I don't know if it's in the document. It's likely that it is, but for the comparison of the cost of the alternatives it would probably be important when costing out the buttressing option that the perpetual maintenance that will have to happen of the fish ladder and of the sluicing operation in perpetuity that those be disclosed to any decision makers.

Response

Please refer to Section 3.1 and Table 3.1-1 of this Final EIR/EIS for a summary of comparative costs for the alternatives considered. O&M costs for all the alternatives are included in the table.

June 29, 2006 letter from Duane James/U.S. Environmental Protection Agency

Comment CR-11

We recognize that one of the project objectives is to minimize the financial impacts to California American Water Company (CAW) rate payers (p. 1-2). Appendix D in the DEIS includes the costs associated with various sediment disposal sites, which represent a portion of the costs of Alternative 2. However, it does not include a cost analysis for the other alternatives proposed, future maintenance costs, or alternative funding possibilities. This information is important to help inform decisions regarding the long-term economic costs or benefits of various measures such as dam removal and on-site sediment stabilization, as well as other alternative measures.

Recommendation: The Alternatives Analysis in FEIS should be expanded to include a short and long-term cost analysis of the alternatives in a comparative format to help inform decisions. It should include information on the feasibility of funding for these projects and any interested parties that may be able to coordinate on project costs or related monitoring and mitigation.

Response

It is not clear what is intended to be included in the short-term versus the long-term cost breakout requested in this comment. Construction and implementation costs (which are typically short-term) and O&M costs (typically long-term) are provided in Section 3.1, Table 3.1-1 of the Final EIR/EIS. The table compares costs for each of the alternatives considered, including the Proponent's Proposed Project.

Funding strategies are being thoroughly explored by CAW. In general, CAW would seek approval from the California Public Utilities Commission (CPUC) for recovery through water sales revenues of the cost of any project it is ordered to carry out. However, the CPUC will not rule on which costs may be included in the rate base until such a rate hearing occurs. No other feasible funding source or strategy for the dam notching (Alternative 1) or dam removal (Alternative 2) has been identified to date. For the Carmel River reroute (Alternative 3), the State of California, through the California Coastal Conservancy, has indicated a preliminary interest in funding the project under a scenario in which CAW would turn over the project and property surrounding the Dam to a non-profit or governmental entity plus contribute a share of the funding necessary to complete the San Clemente Dam Seismic Safety Project in compliance with Department of Water Resources, Division of Safety of Dams, specifications.

June 30, 2006 letter from Mindy McIntyre/Planning and Conservation League Foundation

Comment CR-12

We also note that there is no basis for rejecting Alternative 3 on cost grounds. The DEIR/S does not include any cost projections; naming the Proponent's Proposed Plan as the preferred alternative because alternative 3 is too ["costly"] for CAW to afford would render the EIR/S inadequate. There are no cost estimations in the [DEIR/S]. Cost projections for all options are needed in order to fully grasp the financial aspect of this seismic safety project; seeing that there are none in the public record so far, Alternative 3 cannot be rejected.

Response

Please refer to Chapter 3.1 and Table 3.1-1 of this Final EIR/EIS for a summary of comparative costs for the alternatives considered. The table provides comparative capital and O&M costs for the Proponent's Proposed Project and alternatives. No "preferred alternative" has been designated by the Lead Agencies.

Comment CR-13

The sluice gates, moreover, offer no guarantee of success, and in fact may actually result in a technically flawed sediment management strategy that will require costly modifications and mitigation that will increase the burden on the ratepayers.

Response

Mitigation measures, including sluicing, would be monitored during their implementation. Monitoring and adaptive management is an integral component of the proposed Sediment Operation and Management Plan for Fish Passage (SOMP). Please refer to Appendix J.

Please refer to Section 3.1 and Table 3.1-1 of this Final EIR/EIS for a summary of comparative costs for the alternatives considered. The O&M costs of the Proponent's Proposed Project are higher than those of the dam removal alternatives (Alternatives 2 and 3), but the capital costs of Alternatives 2 and 3 are much higher than the Proponent's Proposed Project. The rate impacts of Alternatives 2 and 3 due to increased capital costs would be many times higher than those of the Proponent's Proposed Project, notwithstanding its higher annual costs.

Comment CR-14

Monitoring costs may be another factor escalating costs to the ratepayers.

Response

Thank you for your comment. Monitoring costs, while small, were considered in preparing the cost estimates for the alternatives (see Chapter 3.1).

FISH & AQUATIC BIOLOGY

WRITTEN COMMENTS RECEIVED

May 24, 2006 letter from Don Redgwick

Comment FI-1

None of the options will protect the habitat of the Red Legged Frog completely, but the habitat can be moved and recreated without ham to the frogs. Enlarging the lake by removing the silt will enhance the fish and bird habitat. **(Also TE-2)**

Response

Thank you for your comment. Comment noted.

Comment FI-2

The program to protect the Red Legged Frog and the Steelhead should be adequate for its purpose, but should not impact a common sense approach that recognizes the cost, water resource, disruption to neighbors and other environmental issues. **(Also TE-3)**

Response

Thank you for your comment. Comment noted.

June 4, 2006 letter from Don Redgwick

Comment FI-3

If the realignment is permanent doesn't that significantly reduce the dam safety and steelhead issues and allow the dam to remain for the benefit of frog, bird, lake fish, and other wildlife habitat? **(Also AA-7, TE-4)**

Conversely if the Carmel River is rerouted on a permanent basis and the San Clemente Dam is left in place with or without a buttress, would that provide a superior habitat for frog, birds, lake fish and other wild life? **(Also TE-4)**

Response

Yes, permanent realignment would eliminate dam safety issues and provide steelhead passage in a free-flowing river. Leaving the Dam in place was not considered because the reservoir would fill over time and is populated by exotic species, which have adverse effect on native species.

June 13, 2006 letter from John G. Williams

Comment FI-4

In terms of steelhead, the major tradeoff is that the dam removal alternatives should facilitate fish passage, but the canyon habitat would be less productive biologically than

the alluvial habitat that would remain in the other alternatives. However, the DEIR does not provide enough information for this trade-off to be assessed.

Response

The text has been revised to more fully address this concern. The concept that alluvial habitat is more productive than canyon habitat may not apply to the alluvial river channel upstream from SCD. Steelhead density data collected by MPWMD shown in Table 4.4-3 indicates that the present alluvial habitat upstream of the Dam has significantly lower densities of juvenile steelhead compared to the canyon reaches downstream of the Dam or upstream of the former reservoir area. Figure 4.4-6 shows the total abundance of juvenile steelhead in Reach 3 (SCD reservoir area) is relatively low compared to the abundance in Reach 4 (downstream of the Dam) or Reach 2 (upstream of the reservoir area). Table 4.4-11 quantifies the length of channel (in feet) and provides an estimate of the number of steelhead affected by the different alternatives. Table 4.4-11 also provides information to evaluate tradeoffs. These tables are discussed in Section 4.4-3 under the different alternatives for Fisheries Impacts FI-1, FI-4, FI-6, FI-9a, and FI-9b. Any estimates of the change in abundance that would occur when the alluvial channels are converted to canyon channels would be speculation.

Comment FI-5

The hazard to steelhead passing over the dam is a salient issue for the assessment of the alternatives (including the preferred alternative), but little information on this point is provided. In sum, the DEIR does not provide the information necessary to make a rational selection among the alternatives, in terms of the long-term effects on steelhead.

Response

A detailed summary of impacts to steelhead is located in Table 2.1 Fisheries Impact Issue FI-12 Downstream Fish Passage over SCD. In summary, if a new ladder is constructed under the Proponents Proposed Project, downstream fish passage conditions would improve because the ladder would carry more than 5 times the flow it can now carry (maximum flow of 10 cfs for the present ladder) which means that all water up to 50 to 55 cfs would pass through the ladder providing fish a safer downstream passage way through the ladder. If the Dam remains as is, downstream fish passage impacts continue as an existing condition. If the Dam is notched, the impacts would change. If the Dam is removed, passage impacts would be eliminated.

Comment FI-6

The DEIR embodies an outdated view of steelhead biology, and takes too narrow a view of the potential consequences of the alternatives. The DEIR could be improved by considering the effects of the proposed project on steelhead in terms of the concepts developed by the National Marine Fisheries Service for recovery of listed "Evolutionarily Significant Units" of salmon, such as the "viable salmonid population concept (McElhany

et al. 2000). In particular, the DEIR should take into account that major alterations to the aquatic environment such as those contemplated here, can have evolutionary consequences (Ashley et al. 2003, Stearns and Hendry 2004). For the Carmel River steelhead, factors affecting the selective trade-off between anadromous and resident life history patterns (RSRP 2004) are a particular concern. Mortality during passage over Los Padres Dam seems to be such a factor.

Response

Fish mortality in passing over Los Padres Dam (LPD) is not an impact of this project. Alternatives that provide steelhead recovery are not within the scope of this Final EIR/EIS. The purpose and need of the action which the Final EIR/EIS evaluates is to provide safety, not to recover listed fish. NMFS would assure the safety of steelhead for any approved project though a Section 7 or Section 10 consultation under ESA and such an analysis may be conducted during that process.

Comment FI-7

The Draft EIR confuses upstream and downstream in a way that may be a harmless result of careless report preparation, or may be more serious. At p. 4-124, the Draft EIR states that "for the purpose of comparison, we will assume that about 40 percent of the habitat in the watershed to support juvenile production of YOY and about 60 percent of the habitat to support juvenile production of yearling steelhead occurs downstream of Los Padres Dam (Dettman and Kelley 1986)" [emphasis added]. These percentages are repeated further down the page. However, at p. 4-119, Table 4.4-6 shows that these percentages apply to habitat upstream from Los Padres. Whether this confusion of upstream and downstream matters depends on whether it occurred before or after the relevant comparisons were done.

Response

Thank you for your comment. The section has been rewritten to clarify the text.

Comment FI-8

This [the notch in the dam under Alternative 1] could be placed at the point where fish would be least likely to be injured in passing over the dam. All else equal, the notch should be placed near the fish ladder. The acceleration of water as it nears the inside notch would create a small area of scour upstream from the dam[1]*, which would reduce the problem of sedimentation near the fish ladder. As noted above, the sediment transport modeling should be reviewed, particularly regarding the option of allowing the river to rework sediments in the notching alternative.* **(Also AA-18)**

[1] This scour just upstream from the dam is a typical feature of dams that are filled with sediment.

Response

Placing the notch near the fish ladder could potentially expose upstream migrating adults that exit the ladder to high velocities with high potential to be swept downstream through the notch. Because the risk of fallback is high, placing the notch near the ladder was not considered further. Regarding sediment transport, see response to Comment SED-8.

June 28, 2006 letter from Jim Crenshaw / California Sportfishing Protection Alliance

Comment FI-9

Both the PPP and Alternative 1 also require a fish ladder to allow fish passage above the dam structure. Unfortunately that will also threaten survival of migrating steelhead unable to navigate safely through the area directly above the sluice gate, causing fish to become caught up in the downstream flow, and back downstream through the sluice gate.

Response

Please refer to the SOMP (Appendix J). Protocols call for the sluice gate to be open for a period of 2 hours. A grate would be closed on the upstream end of the ladder to prevent fish from swimming out of the ladder into the front of the sluice gate before and during the sluicing event.

THERE IS NO COMMENT FI-10

June 30, 2006 letter from Trish Chapman / California Coastal Conservancy

Comment FI-11

Old Carmel River Dam (OCRD). The proposed project and all alternatives propose notching the OCRD to improve fish passage. This will not provide complete and unimpaired passage for fish at this location. Complete removal of the OCRD should be included as mitigation for ongoing fish impacts under the proponent's proposed project and Alternative 1.

Response

Complete removal of the OCRD was not considered because the abutments on both sides of the river support a bridge at this location. However, notching the ORCD would remove a major section of the dam down to the riverbed between the abutments which would eliminate any fish passage issues at the site. Notching the OCRD to improve fish passage is unrelated to the partial notching of SCD (Alternative 1) which would be done to achieve dam safety. The purpose and need of the action evaluated in this EIR/EIS is to provide safety, not to improve fish passage throughout the Carmel River. Developing alternatives that remove fish passage obstacles such as at the OCRD are beyond the scope of this EIR/EIS. However, improvement to fish passage at the OCRD would

provide partial mitigation for impacts to fish associated with the Proponent's Proposed Project and Alternatives 1, 2, and 3.

Comment FI-12

The amount of spawning and/or rearing habitat that would be permanently lost in the abandoned portion of the Carmel River should also be analyzed.

Response

An evaluation of the distribution of spawning habitat in the Carmel River up and downstream of SCD is provided in Table 4.4-5 of the Final EIR/EIS. There is very limited spawning habitat downstream of SCD in Reach 4 because of poor substrate conditions (an armored bed). Spawning habitat is not present in the Carmel River for about 2,500 feet upstream of the dam because the channel is mostly a sand bed. However, conditions are constantly changing and spawning opportunities are expected to improve in the future. Tables 4.4-10 and 4.4-11 have been added in Section 4.4.3 of the Final EIR/EIS to clarify the tradeoffs of the various alternatives. For Alternative 1, the newly constructed channels upstream of the Dam would increase the amount of spawning habitat compared to what is present under existing conditions in Reach 3 and in San Clemente Creek. For Alternative 2, the reconstructed channels would provide about the same length of channel for the Carmel River and about 1,500 feet of San Clemente Creek (a change from an alluvial channel to a canyon channel) and it would create about 850 ft of new channel for San Clemente Creek (the length of channel presently underneath the reservoir).

Comment FI-13

Depending on the findings of the hydrology and water resources impact analysis, additional impacts may need to be analyzed, including long-term impacts to spawning and/or rearing habitat as a result of changes in San Clemente Creek hydrology and channel morphology.

Response

Expanded sediment transport modeling has been incorporated in the revised Sections 4.2 and 4.4 in the Final EIR/EIS. Table 4.4-10 shows the overall changes to stream channel lengths and fish populations for each alternative. Spawning habitat is not considered to be a limiting factor in the Carmel River. Table 4.4-10 in the Final EIR/EIS provides the overall changes to channel lengths for the Alternatives.

Comment FI-14

The proposed fish ladder will have delay by design for sluicing operations. The significance of the delay has been mischaracterized by a) comparing it to natural delays with which any stock has co-evolved and b) citing studies for long-run salmonids in the more constant flows of the Columbia River system. Delay is unlikely to be as significant

to long-run fish in steady flows as it is to Carmel steelhead. In the reservoir, upstream movement is likely to be impacted despite sluicing operations.

Response

Please see the revised SOMP (Appendix J) in the Final EIR/EIS for sluicing protocols. Delays from ladder closure are anticipated to be on the order of hours, and include the time period before and during the sluice event. If there were six sluice events during the migration season and the ladder were closed for a full day each time that would affect 3.6 percent of the days of the migration season. If there were two such sluicing events in the peak season and the ladder were closed for a full day each time that would affect 3.4 percent of the days of the peak season.

Comment FI-15

The potential delay on fish passage may be significantly underestimated. Page 3-35 of the document acknowledges that "significant storm events might cause excessive build up and clogging of the upstream channel that cannot be cleared by sluicing alone." For this reason, the EIR/EIS anticipates the need for dredging the channel every 3 years. Based on this, it seems that passage could be blocked for significantly longer periods of time than are analyzed in the EIR/EIS if dredging is needed to clear the channel. **(Also SED-13)**

Response

The revised SOMP in the Final EIR/EIS (Appendix J) has been revised in response to this and other comments to provide a greater focus on sediment management. See also Impact Issues FI-8, FI-9a and FI-b in Section 4.4 of the Final EIR/EIS. As part of the SOMP, dredging would be conducted in the fall to prepare the site to support fish passage. Large storm events would create backwater effects at the Dam and would generate turbulence immediately upstream of the Dam that would maintain passage conditions upstream of the ladder. If an event occurs that renders the site impassible, procedures would be implemented to remove debris from the upstream side of the ladder to restore fish passage as quickly as possible, similar to a NMFS permitted activity that occurs on the Lower Yuba River at Daguerre Point Dam for Central Valley Chinook salmon and steelhead.

Comment FI-16

Passage through the reservoir is likely to be poorer (higher water temperature, decreased cover, increased predation) in perpetuity under sluicing operations than it was with a deep reservoir just a few years ago and certainly poorer than a renatuaralized stream reach.

Response

The filling of the reservoir is part of the baseline environmental condition and would not be an impact of the project. Without any action, within six to ten years, there would be

no reservoir behind SCD except for a remnant pool. Under the No Project Alternative, passage would not occur through a reservoir but through the remnant pool and flowing channel. Temperature and lack of cover would become less of a problem as the Carmel River developed into a more mature channel upstream of SCD, much as it has throughout the rest of the reservoir area. Major predators for steelhead in the Carmel River are birds, but San Clemente Reservoir does support green sunfish and perhaps a few brown trout which are also predators of steelhead. The natural elimination of the reservoir would incidentally eliminate green sunfish habitat and thereby could provide a benefit to steelhead. Maintaining a deep reservoir at San Clemente Dam is beyond the scope of this project.

Comment FI-17

Issue FI-9 Sediment Impacts to Downstream Channels from Sluicing, Dredging of Sediment Transport Downstream. The impacts to steelhead from sediment caused by sluicing operations would be significant and permanent. The mitigation discussion states that "sluicing operations would begin with short duration sluices and impacts would be thoroughly evaluated to determine effects on downstream channels, habitats, and fishes." More information needs to be provided about regarding [sic] this intended course of action. What will be done to keep the upstream channel clear if short duration sluices are not sufficient to do so? What level or type of downstream impact would trigger a change in the SOMP, given that the impact is already identified as significant? If downstream impacts are such that different course of action is warranted, what would the alternative approach be to dealing with sediment in the reservoir? **(Also SED-14)**

Response

Please see the revised SOMP (Appendix J) and mitigation for FI-9a in the Final EIR/EIS (was FI-9 in the Draft EIR/EIS). The SOMP has been revised in response to this and other comments. As a result of the further studies and analyses conducted in response to comments on the draft EIR/EIS, the impact determination for downstream sediment impacts associated with sluicing is now determined to be less than significant. See Section 4.4 of the Final EIR/EIS. Sluicing would change the timing of the sediment being transported downstream, but would not greatly influence the overall volume of sediment transported past the Dam or greatly influence the characteristics of the downstream channel relative to the amount of the sediment that would be transported by storm flows. Also see the response to SED-14 for further details on sediment management.

Comment FI-18

Based on the information provided in Appendix I, the Sluicing Operations and Maintenance Plan (SOMP) outlined in Appendix J does not seem sufficient to maintain a viable channel from the exit of the fish ladder to the reaches above the reservoir. The impact discussion for Issue FI-9 states that sluicing operations would occur over a 1 to 4 hour event when flow is over 300 cfs and increasing. According to Section 3.3 of

Appendix I, the incised channel created by each sluicing event could be filled back-in within a few days. Given the unpredictability of stream flows in the river, sluicing will not provide a sufficient guarantee that there will be an adequate channel for fish passage from the exit of the fish ladder to the reaches above the river. The proponent's proposed project and Alternative 1 must develop a more reliable way to insure fish passage past the ladder. **(Also SED-15)**

Response

Please see the additional sediment transport analyses that are discussed in Section 4.2 of the Final EIR/EIS. In the Final EIR/EIS, the revised SOMP is located in Appendix J, and in Section 4.4, Impact Issue FI-9 has been separated into Impact Issues FI-9a and FI-9b.

Comment FI-19

The sluicing operations presented for the proponent's proposed project and the Alternative 1 are untested and lack specificity. In addition, the plan is based on migration records of an already residual run and an idealized world of average hydrology, single storm events and steady state conditions. Real operations, with the vagaries of real-time hydrology, sediment movement, debris and difficulty in access/operation during storm are likely to overwhelm the flexibility of the chosen system. The proponent's project and Alternative 1 need to define an alternate approach that would be used if sluicing operations are not adequate maintain fish passage without significant impacts on fish or downstream reaches. **(Also SED-19)**

Response

In response to this and other comments, additional sediment transport modeling was conducted to address behavior of the sediment upstream of the fish ladder and other methods were developed in the SOMP (Appendix J) to address sedimentation that could impair fish passage. Please see the discussion in Sections 4.2.3 and 4.4.3 of the Final EIR/EIS. Maintaining access to and from a fish ladder on the Lower Yuba River has been successfully implemented and permitted in a NMFS Biological Opinion. Maintaining access to and from the fish ladder for the San Clemente Dam Seismic Safety Project would adopt a similar approach but would employ sluicing and dredging as tools to maintain access.

Comment FI-20

Operations and Maintenance, Proposed Project and Alternative 1. Both the proponent's proposed project and Alternative 1 will require permanent ongoing maintenance of the fish ladder and the sediment behind the dam (through sluicing or other methods) to mitigate for impacts of leaving the dam in place. How will this maintenance be guaranteed? Will there be a maintenance endowment? **(Also SED-17)**

Response

Funding for operation and maintenance of the sluice gate would be provided through the normal budgetary process of the owner and paid by the revenues of the water system.

June 20, 2006 letter from Mark Delaplaine/California Coastal Commission

Comment FI-21

Introducing sediment into the river by sluicing, as in the proposed project and alternative 1, could adversely affect steelhead and their habitat by causing abrasion of the fish, decreased dissolved oxygen, disturbance of streambeds and filling of the interstitial spaces between spawning gravel. Where the sluicing operations are described in the Draft EIR/EIS as mitigation for "short-term, significant and unavoidable" effects, it would appear that the mitigation itself could possibly cause long-term changes in the amount and type of sediment transported from the upper watershed to the lower Carmel River, changes in the sediment composition in the river and changes in the amount of sediment stored in the river below SCD. The sluicing operations proposed require further study to determine their efficiency and long-term effects, particularly with regard to the part of the river that is in the coastal zone. **(Also SED-19)**

Response

It is a misconception that the river would remain free of upstream sediment in perpetuity. This is not the case as sediment would begin moving past the Dam within six to ten years with or without sluicing, and even under No Project conditions. Please refer to the revised SOMP (Appendix J) in the Final EIR/EIS. Sluicing would only change the short-term timing of the volume of sediment moved past the dam site. The effects of sluicing would not be detectable more than about 2.5 to 3 miles downstream of SCD because of the existing sediment contribution from downstream tributaries.

Comment FI-22

Extraordinary measures are currently employed on the river to accommodate steelhead, such as a rearing facility, fish ladders and trap and truck operations. These artificial management methods all cause very high mortality rates that threaten the long-term health of the steelhead population. The construction activities of each of the project alternatives would put additional stress on the steelhead population that may reduce the population to a size that threatens loss of genetic diversity and fitness, and could reduce it to a remnant.

The proposed project, as well as the proposed alternatives, will interrupt and reduce flow levels of the Carmel River, particularly during summer and fall months when most of the construction will take place, and the river is naturally at its lowest. Among the proposed alternatives, the shortest estimated duration of construction is two years, while the longest is five years. Each alternative would disrupt spawning, rearing and

migration, putting great additional stress on an already stressed population. A significant additional reduction in numbers would substantially reduce the viability of the population. The Draft EIR/EIS either should acknowledge that this accumulation of stress will likely cause a reduction in the steelhead population's size, genetic diversity and fitness, or should demonstrate convincingly why such adverse effects will not take place.

Response

The completed project would not significantly affect flows in the river. Short-term flow disturbances would occur during the construction period. The construction period has been established to avoid impairment of the migration season. Rearing in the construction area would be disturbed but rearing would not be disturbed in the portions of the river outside the construction area. Spawning should not be disturbed since spawning would generally occur prior to the construction season. River flows during the low flow periods are currently established through a cooperative agreement between the MPWMD, CAW, DFG and NMFS. State and federal agencies actively manage all activities on the Carmel River that may have an effect on the current steelhead populations and these agencies would continue to do so through their permitting processes. Permits and authorizations from DFG and NMFS would address construction activities associated with the Dam improvement or removal alternatives and potential impact to fisheries resources. These permits would allow an agreed-upon amount of steelhead take that would be associated with the project.

Comment FI-23

In neither section 4.4 Fisheries or Appendix G Carmel Reach Descriptions, does the Draft EIR/EIS adequately describe the fisheries potential in each of the reaches of the Carmel River. Because each reach is quite unique in terms of human impact and habitat conditions, the Draft EIR/EIS should include more detailed fisheries information in narrative form for each reach of the river, including a description of spawning and rearing habitat, current artificial management efforts and estimates of steelhead mortality rates from all causes. The current descriptions of reaches 0 through 3 include good information regarding spawning and rearing potential for steelhead, but descriptions of reaches 5 through 7 include no fisheries information. Descriptions of reaches 8 and 9 include only the barest information regarding fisheries.

Response

NEPA and CEQA guidelines specify that impacts shall be discussed in proportion to their significance. The project would have more substantial impacts to fisheries in the stream reaches immediately above and below the Dam (reaches 3 and 4). Information provided in the Final EIR/EIS for these reaches includes juvenile population densities, length of channel, and general distribution of spawning and rearing habitat in the Carmel River. Please refer to Tables 4.4-1, 4.4-3, 4.4-4, 4.4-5, 4.4-6, and 4.4-7 and Figures 4.4-1, 4.4-2, and 4.4-6 in the Final EIR/EIS. Tables 4.4-9 and 4.4-10 were

added to clarify impacts of the different alternatives to San Clemente Creek and to Carmel River reaches 3, 4, 5, and 6.

Additional text regarding spawning and rearing habitat in Reaches 4, 5, 7, 8 and 9 has been added to Section 4.4.1 in the Final EIR/EIS to summarize all currently available information. Table 4.4-11 summarizes impacts of the Proponent's Proposed Project and the Alternatives to spawning and rearing habitat in the reaches closest to the Dam.

Comment FI-24

The Draft EIR/EIS should include a more detailed map of each river reach with current fisheries conditions and short and long term changes expected as a result of the proposed project.

Response

NEPA and CEQA guidelines specify that impacts shall be discussed in proportion to their significance. The project would have more substantial impacts to fisheries in the stream reaches nearest the Dam (San Clemente Creek and Carmel River reaches 3 and 4 and to a lesser extent reaches 5 and 6). Juvenile fish conditions in the Carmel River are highly variable from year to year in response to the size of the returning adult run and habitat conditions. Current conditions do not necessarily represent the range of conditions that can occur in the river. A summary of the available data is presented in the Final EIR/EIS, and a long-term average is used to estimate impacts to fish populations. Maps and descriptions of the Carmel River fishery and geomorphic reaches are provided in Figures 4.4-1 and 4.4-2 and in Table 4.4-1. Juvenile abundance data (densities by year and population levels) are provided in Tables 4.4-3 and 4.4-4. Habitat distribution in the river is provided in Tables 4.4-5 and 4.4-6. An impact summary of the different alternatives to channel length (habitat) and steelhead abundance are provided in Table 4.4-10. Table 4.4-11shows, in more detail, the trade-offs between the Proponent's Proposed Project and the Alternatives.

Comment FI-25

Mitigation for FI-4 effects – Reservoir Drawdown, and FI-5 effects—Diversion of Carmel River and San Clemente Creek for Construction Purposes, consists of trapping fish above the reservoir and relocating them to "other suitable habitat downstream of the SCD." The Draft EIR/EIS should include a detailed plan for this relocation and an assessment of the risks, given the high mortality rate currently experienced at the Sleepy Hollow Rearing Facility and the existing trap and truck operations, and the low rates of successful rearing on the river as a whole. This plan should be subject to review by NMFS, [C]DFG and USFWS.

Response

The Trap and Truck program was proposed as mitigation for fish ladder closures during the upstream migration program. It is no longer part of any of the alternatives since

regulatory agencies have indicated that construction will most likely not be permitted during the period of upstream migration (see Impact Issue FI-3 in Section 4.4 of the Final EIR/EIS). Rescue and relocation of juvenile fish is discussed under Impact Issues FI-2, FI-4 and FI-5 in Section 4.4. Regulatory agency approval of a detailed plan for the relocation of steelhead would occur as part of permitting the selected alternative, as directed by NMFS, CDFG, and the USFWS. NEPA and CEQA require a focused evaluation of impacts and development of mitigation measures however, additional species and habitat-specific information is often required during the permitting process. For example, the Biological Assessment required under the Endangered Species Act would describe the resource, impact mechanisms, and would detail measures to avoid or minimize take for steelhead. In the case of the San Clemente Dam Seismic Safety Project, permitting was not conducted in parallel with preparation of the EIR/EIS, but it commence once a project alternative is selected.

June 29, 2006 letter from David A. Berger / Monterey Peninsula Water Management District

Comment FI-26

Page 2-2, Para 1: The statement, "and a trap and truck facility would be operated for one construction year", appears to conflict with other descriptions of proposed mitigations for trapping and handling steelhead in the Fish Chapter. The Final EIR/EIS should fully describe how fish will be trapped and trucked for each alternative during the entire scheduled project period, not only during actual construction activities. If fish are not trapped and trucked during the entire scheduled period, the FEIR/S should fully describe how fish movements will be impacted during the off-construction period and whether additional mitigations are needed.

Response

A detailed plan would be prepared for the selected alternative during permitting. Please refer to response to Comment FI-25.

Comment FI-27

Page 2-39, Para 1: Under Fisheries: "The PPP and all alternatives would entail short-term losses of fish habitat." With at least one alternative–the Dam Removal Alternative – there would be long-term beneficial changes to habitats. The FEIR/S should fully evaluate short-term, mid-term and long-term changes for spawning and rearing habitats from the upper end of San Clemente Reservoir to the Carmel River Lagoon.

Response

Please refer to response to Comment FI-12.

Comment FI-28

Page 2-39, Para 1: Under Fisheries: In the Summary Statement, the operation and impacts to Sleepy Hollow Steelhead Rearing Facility and its vulnerability to increased

sediment and turbidity is not mentioned. The FEIR/S should fully evaluate impacts of the alternatives and describe the mitigation measures that Cal-Am will implement to reduce impacts to SHSRF. If the impacts, especially during construction, cannot be avoided, the FEIR/S should disclose impacts and potential take associated with not rearing steelhead at SHSRF during the construction period. It should be noted that the MPWMD operates and maintains the SHSRF as mitigation for impacts to steelhead from water extraction in Carmel Valley.

Response

Mention should have been made of the potential impacts from project activities to the SHSRF in the summary statement. The Final EIR/EIS has been revised to reflect this. For the Proponent's Proposed Project and each alternative, potential impacts to the SHSRF are analyzed in Section 4.4.3 of the Final EIR/EIS under Impact Issue FI-15.

Comment FI-29

Page 3-25: Location of High-Level Outlet: Appendices I and J describe the location of a sluice port as being 10 feet laterally away from the fish ladder. This does not match the description on page 3-25 and is not shown in Figure 3.2-12 for the new fish ladder. The orientation of discharge from the 10-foot diameter sluice gate, located 10 feet from the entrance to the fish ladder, appears to impinge on the left downstream walls of the canyon. This orientation, while effectively designed for sluicing material away from the fish ladder, may threaten integrity of rock supporting the new ladder and result in significant impingement loss of any fish passing downstream. Mitigation measures are needed to ensure that no fish are in the vicinity of the gate when it is opened and the discharge should be directed away from the canyon walls.

Response

In this section has been revised to correctly describe the location and orientation of the sluice port. Figure 3.2-12 is intended to highlight the fish ladder design only; sluiceway details are shown on Figures 3.2-5 and 3.2-6. The location and orientation of the sluiceway would result in discharging into the plunge pool and would not impinge on the left downstream canyon wall. Rock integrity would be protected by shotcrete installed as part of dam thickening.

Operation of the sluice gate would be coordinated with operation of the fish ladder. During wet season operations, prior to operation of the sluice gate, access from the ladder into the reservoir would be prevented by closing a gate at the upstream end of the fish ladder that would prevent adult steelhead from moving into the reservoir. Access from the ladder into the remnant reservoir would be closed for several hours prior to a sluice event allow for fish that had exited the ladder to move upstream away from the sluice port. Operation of the sluice port would not occur until flows reach about 300 cfs over the Dam. The sluice port would be partially opened to increase velocities in the area in front of the port and encourage any fish that may be in the vicinity to move upstream and away from the port. The port would then be opened fully for a two hour

period. Neither of these measures can assure that all fish would be prevented from entrainment in the sluice event and could result in fallback. Fallback may already occur under existing conditions as fish that ascend the ladder get swept back downstream over the spillway. The increase in the amount of fallback is expected to be small since wet season sluicing will be minimized and if it does occur, would occur for a period of two hours per event. The fish that are swept back downstream would have to re-ascend the ladder.

Comment FI-30

The FEIR/S should fully evaluate how the ports would be operated in conjunction or separately, and the impacts of the operation on sediment mobilization, passage and deposition in the river below the dam should be evaluated and described. While a brief description of sluice gate operations is provided, the proposed schedule has not been combined with the reconstructed record of unimpaired flows to provide a full description of the frequency and duration of operation and how this will affect migration of adults and juvenile fish

Response

Please refer to the revised SOMP (Appendix J) for a full description of sluicing to support fish passage. The revised SOMP includes an integration of operations with existing streamflow conditions.

Comment FI-31

The FEIR/S should document any previous attempts to sluice material from behind similar dams, while passing fish upstream and downstream. The FEIR/S should present enough information to the reader to be able to determine whether the proposed sluicing operations are a proven technology or are experimental.

Response

There are no comparable examples to draw upon regarding sluicing sediment from behind a dam of this size specifically for the purpose to maintain fish passage. Sluicing has been done for other purposes such as keeping hydroelectric intakes free of sediment or to clear sediment from diversion dams. Much larger volumes of sediment have been sluiced in these examples compared to what is being considered at SCD. Based upon available information, this sediment sluicing plan is feasible and would be closely monitored, evaluated and refined. Please refer to the revised SOMP for details.

Comment FI-32

Pages 3-25 and 3-26: The text does not mention whether the outlet would be screened and how fish passage would be handled. If unscreened, the FEIR/S should evaluate how survival of fish would be affected as they pass through the sluice gates/valves.

Response

The sluiceway would not be screened. When in operation, downstream fish would pass through the sluiceway. The ladder would be closed and operation of the sluiceway would eliminate flow from the dam spillway. Hydraulic modeling indicates no backwater would occur and the flow in the sluiceway would not be under pressure. Fish moving through the sluiceway would be carried by a flow similar to fish moving over the dam, except the fall would be slightly lower, however the concentration of flow would be much greater as would the turbulence where it enters the plunge pool. The concentration of flow and the sediment being transported would expose fish to impacts with sediment particles that would cause injury to fish under certain conditions. Overall downstream fish passage is improved under this alternative because the ladder would provide downstream passage at all flows up to 55 cfs and a portion of the flows when flows are greater than 55 cfs. Sluicing would occur for relatively brief periods several times a year.

Comment FI-33

Page 3-31, Para 2: Under San Clemente Dam Fish Ladder Replacement. "For stream flows up to 55 cfs, all flow would pass through the proposed ladder." This design will encourage passage of fine grained sand and silt into the vicinity of ladder exit and hasten the need to sluice sediment from around the ladder exit and channel leading to the river. The FEIR/S should evaluate ways to mitigate this impact with a goal of having no impact on attraction of fish to the ladder entrance in the plunge pool.

Response

The ladder is designed to pass fined sediment. Sediment accumulation in front of the ladder would be removed by sluicing or dredging. Please refer to the Revised SOMP (Appendix J). Consistent with the requirements of NEPA and CEQA, the Final EIR/EIS seeks to provide all feasible mitigation with a goal of reducing impacts to a level less than significant.

Comment FI-34

Page 3-35, Para 1: "… would be a consistent velocity of ~6.6 feet per second through the slot regardless of depth." This velocity may exceed the swimming capability of smaller, resident-type steelhead and affect passage success during drought periods, when the only fish attempting to pass are resident type fish. The FEIR/S should investigate, describe and include modifications to allow passage of smaller resident type fish under extremely low-flow conditions.

Response

The proposed fish ladder would provide a large improvement over existing conditions, since juvenile fish cannot move up the existing ladder at all under any flow conditions. The stated 6.6 f/s velocity is the speed of the water at the slot. The distance over which that velocity would occur expands both up and downstream of the slot at higher flows, and contracts to shorter distances at low flows. Juvenile fish would be able to burst

through the slot or jump through the slot. Juvenile fish cannot ascend the existing ladder at any flow.

Comment FI-35

Page 3-39, Para 1: "Fish rescue and drawdown of the reservoir and plunge pool would continue until about May 31." Additional detail should be added to provide rescue, trapping, and trucking of fish in upstream and downstream directions throughout the mobilization, construction and demobilization periods, except during high flow periods when streamflow makes trapping infeasible. In addition, the time periods between mobilization, Phase1, Phase 2 and demobilization may have features that affect fish passage, so the FEIR/S should specify mitigations for fish passage throughout the project period, not just when construction is scheduled.

Response

Detailed rescue and relocation plans would be developed for the selected project during permitting phase. Please refer to response to Comment FI-25.

Comment FI-36

Page 3-51, Para 5: "A removable section would be disassembled annually to allow stream and fish passage during the non-construction periods." The FEIR/S should describe additional mitigation that may be required for trapping and transporting fish past the construction zone at the temporary diversion facility, if channel conditions and habitat in the reach below the diversion are not suitable for juvenile residence and passage downstream during the non-construction season at low flows.

Response

A detailed plan to provide fish passage during non-construction periods would be developed for the selected project during permitting phase. Please refer to response to Comment FI-25.

Comment FI-37

Page 3-56, Para 2: Statements on stream flow up to 55 cfs being routed through the ladder and dredging upstream of the fish ladder should be reviewed and updated per previous comments re: PPP on pages 3-33 to 3-35. **(Also AA-39)**

Response

Thank you for drawing this to our attention. These issues are addressed in the revised SOMP (Appendix J). See response to Comment FI-33, above.

Comment FI-38

The Draft EIR/EIS does not describe impacts to rearing habitats in the river channel within the existing inundation zone of SCR. The FEIR/S should address the potential for

temporary, mid-term and long-term habitat gains/losses in inundation zones along the mainstem and San Clemente Creek.

Response

The existing inundation zone in the reservoir is identified as Fisheries Reach 3 and is included in Figure 4.4-1, and Tables 4.4-1, 4.4-3 and 4.4-5 in the Final EIR/EIS. The document defines impact mechanisms and time frames in Section 4.4.2 and discussed impacts in Section 4.4.3. New Tables 4.4-10 and 4.4-11 have been added for clarification. Please refer to the response to FI-12.

Comment FI-39

The FEIR/S should fully evaluate effects on spawning and rearing habitat in the reach below the diversion sill.

Response

An evaluation of habitat gains and losses is provided in Table 4.4-10 and is clarified in Table 4.4-11.

Comment FI-40

Page 26, Figure 16 – This figure indicates that for the notching option, at flows above the two-year level (2,250 cfs), velocity just downstream of the dam would exceed 50 feet fps or more than 34 mph, which is close to the velocity associated with free fall. What is the estimated mortality rate of adult and juvenile steelhead during this type of fall when they are migrating downstream?

Response

This comment refers to a reference document (MEI 2007b) included in the Appendix S. The channel velocity from Figure 16 for a 2,250 cfs flow event is in the 6 to 8 feet per second (fps) range but the velocities are in this range for the maximum mean daily flow, the 100 year flow and the PMF flows. Velocity, in and of itself, doesn't cause injury. Injury or death would occur as a result of downstream steelhead striking immovable objects, such as the edge of a dam or downstream obstructions. Injury or death could also occur from rapid deceleration or by encountering severe turbulence. Terminal velocities (in free fall through the air) are a function of the body mass. Juvenile fish do not reach a terminal velocity high enough to cause injury (Bell 1991). This is a well-known fact employed by the CDFG and used to plant fingerlings into remote high mountain lakes by airplane. Large juvenile or adult steelheads do reach terminal velocities that can cause injury or death when dropped from the air into standing water. The effect would be substantially less if the fish are entrained in the flow and entering the plunge pool. Mortality rates for fish striking water (a free fall through the air) is 0 percent for a velocity of up to about 60 fps increasing linearly up to about 100 percent at 150 fps. Mortality rates for fish striking a solid object is 0 percent for velocities up to about 35 fps and increases linearly to about 20 percent at 60 fps and about 90 percent

at 170 fps (Bell 1991). The highest velocity indicated in the referenced Figure is about 68 fps. At these velocities, the mortality rate of fish striking a solid object in the water would be about 28 to 30 percent.

The mortality and injury rates have to be compared to conditions that would exist at the base of the Dam during these large flow events (fish are entrained in moving water and being carried into a turbulent pool) which would reduce the impact compared to a fish that is free falling through the air into standing water. The comparison of impacts have to be compared to existing conditions (which would be similar in magnitude, if not higher because there are vertical supports between the 24 spillways that fish could impact under existing conditions compared to no supports with the notched dam and two with the Proponent's Proposed Project). Finally, fish do not tend to migrate downstream during extremely high flow events and typically hold in areas outside of the main flow until flow conditions become less chaotic.

June 22, 2006 letter from David Zaches

Comment FI-41

The best alternative for the retrofit or dam removal project is that which is sensitive to the steelhead fish runs and the total flora and fauna of this Camel River Watershed - one of the jewels of the entire state of California. If the expense is more for the dam project which leads to the best restoration (and continuation) of this fine watershed, interagency plans and cooperation are well justified to make the larger project possible.

Response

Thank you for your comment. Comment noted.

June 30, 2006 letter from Dick Butler / NOAA's NMFS

Comment FI-42

As you may know, the current run-size for the entire S-CCC DPS is estimated be approximately 500 adults per year, which represents a decline of over 90 percent of the historic run-size. The percentage decline of the Carmel River steelhead run is likely greater. NMFS has determined the already severely depressed Carmel River steelhead run cannot be allowed to decline further if recovery of the S-CCC DPS is to be achieved.

Response

Thank you for your comment. Comment noted.

Comment FI-43

Based on our review of the Draft EIR/EIS, our knowledge of river dynamics, and our technical expertise regarding listed salmonids, NMFS expects the Proponent's Proposed Project and Alternative 1 may result in substantial and unacceptable impacts

to the Carmel River and would likely request the Corps to deny California American Water Company's permit as proposed.

Response

Thank you for your comment. Comment noted.

Comment FI-44

Based on our review of the Draft EIR/EIS, implementing the Proponent's Proposed Project or Alternative 1 will result in long-term adverse effects to all steelhead life stages, including annual mortality, delayed adult migration and long-term degradation of the habitat downstream of San Clemente Dam that supports all life stages of steelhead. NMFS's most significant concern is the adverse effects to steelhead and degradation of their critical habitat that would occur for as long as the San Clemente Dam remains in place and management of sediment (i.e., sluicing) is conducted.

Response

Continuing effects of San Clemente Dam on fish passage and habitat, including annual mortality, delayed adult migration, and long-term degradation of the habitat downstream of San Clemente Dam that supports all life stages of steelhead, are part of the baseline environmental condition. They are not impacts of the project. Under the No Project Alternative, sediment will begin passing downstream within six to ten years as the reservoir continues to fill. Sluicing under the Proponent's Proposed Project and Alternative 1 would affect only the short-term timing and concentration of sediment transport.

June 30, 2006 comments from National Marine Fisheries Service

Comment FI-45

The Draft EIR/EIS recognizes the protected status of the Carmel River steelhead population, but does not fully reflect the importance of the population to the South-Central California Coast (SCCC) Distinct Population Segment (DPS). Restoring the Carmel River steelhead run is expected to play an essential role in the recovery of the S-CCC DPS, and its eventual delisting, but the Draft EIR/EIS does not acknowledge this.

Response

Thank you for this perspective. Comment noted. Section 4.4.1.3 on the status of Carmel River Steelhead discusses briefly the place of the Carmel River steelhead population in comparison to other west coast populations. The purpose and need of the action evaluated by the EIR/EIS is to improve dam safety. All alternatives affect fish passage, and each includes elements to minimize the effect on fish, mitigate significant impacts, and to make improvements in maintaining fish passage, compared to existing conditions. During permitting and implementation of the selected project the applicant

would work with NMFS, and other regulatory agencies, to avoid or minimize take and other impacts during project construction and operation.

Comment FI-46

The Draft EIR/EIS provides only the most recent run-counts in the Carmel River and does not provide any historic context in which to assess the size of these most recent runs, either within the Carmel River itself or in the S-CCC DPS, of which the Carmel River is a part. The original[2] and most recently up-dated[3] NMFS's Status Review for Environmentally Significant Units of West Coast Salmon and Steelhead have reported that the historic run size of the Carmel River in 1928 was estimated by the California Department of Fish and Game at 20,000 adults per year, which is the largest steelhead run in the S-CCC DPS. The current run-size for the entire S-CCC DPS is estimated to be approximately 500 adults per year, which represents a decline of over 90 percent of the historic run-size. The percentage decline of the Carmel River steelhead run is likely greater. Analysis in the Draft EIR/EIS fails to demonstrate that the Proponent's Proposed Project and Alternative 1 will not further the decline of the Carmel River steelhead run.

Response

NEPA and CEQA do not have the same objectives as the ESA . The Draft EIR/EIS is intended to provide full disclosure of impacts and propose feasible mitigation measures, with the objective of reducing impacts to a level that is less than significant. Impacts from the proposed project and any alternatives are evaluated relative to existing conditions. This does not require analysis of impacts to the entire S-CCC DPS or relative to the historical abundance of adult steelhead in the Carmel River. This analysis would occur under a section 7 or section 10 consultation. The period that was used for analysis utilized data on the adult run size and juvenile abundance. These data sets are inconsistently available historically. The purpose of the EIR/EIS is to evaluate the impacts of the project on existing habitat and fish population in the Carmel River, not to demonstrate the relative impact of the project on the status of the DPS. The selected alternative would be permitted presumably through a section 7 consultation between USACE and NMFS and USFWS and Reasonable and Prudent measures would be employed to avoid and minimize take.

The cited NMFS status review estimate for historic and current run size has been added to the section *Status of Carmel River Steelhead*, at the end of paragraph 1 in the Final EIR/EIS.

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[2] Busby, P.J., T.C. Wainwright, G.J. Bryant, L.J. Lierheimer, R.S. Waples, F.W. Waknitz, and I.V. Lagomarsino. 1996. Status of West Coast steelhead from Washington, Idaho, Oregon, and California. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-27.

[3] Good, T.P., R.S. Waples, and P. Adams, editors. 2005. Updated status of federally listed ESUs of West Coast salmon and steelhead. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-66.

Comment FI-47

As part of the recovery planning for the S-CCC DPS, the Carmel River has been consistently ranked by NMFS as the most potentially viable steelhead watershed. NMFS has determined the already severely depressed Carmel River steelhead run cannot be allowed to decline further if recovery of the S-CCC DPS is to be achieved. Section 7(a)(1) of the Federal Endangered Species Act (ESA) makes it clear that all Federal agencies should participate in the conservation and recovery of listed threatened and endangered species.

The Carmel River has been designated as critical habitat for S-CCC DPS steelhead. The Carmel River downstream of San Clemente Dam supports a significant portion of the juvenile steelhead rearing in the lower Carmel River. The Draft EIR/EIS identifies significant adverse impacts to steelhead spawning and rearing habitat below San Clemente Dam associated with the sluicing of the reservoir to maintain effective operation of the reconstructed fish passage facilities. These include the repeated discharge of concentrated levels of finer sediments which would adversely affect steelhead habitat downstream.

Response

Further studies and analysis conducted in response to this, and other comments, show that the slucing would have minimal to no adverse effects on steelhead. Sluicing and other sediment management activities would be conducted pursuant to the revised SOMP (Appendix J) in the Final EIR/EIS which would be an adaptive management plan that would be carried out in consultation with NMFS, and other appropriate agencies. Please also see also the response to Comments FI-45 and FI-46, above.

Comment FI-47a

The mitigation identified for this significant adverse impact consists of "minimizing impacts on steelhead" and a further evaluation "to determine effects on downstream channels, habitat and fishes". This proposed mitigation is flawed in two fundamental respects.

First, the proposal to further evaluate adverse effects of the proposed sediment sluicing operation on the downstream channel, habitat and fishes is not itself mitigation, and such proposals have been consistently rejected in judicial review under the California Environmental Quality Act (CEQA).

Response

Sediment sluicing would be employed to keep sediment from accumulating in the area in front of the fish ladder. The action would facilitate fish passage from the ladder exit into upstream channels. With or without sluicing, fine sediment will begin to pass SCD within six to ten years and is considered part of the baseline condition (see the Final EIR/EIS, Section 4.4.1.8). Active management of the sediment would be mitigation. Monitoring the effects of that sediment on downstream aquatic habitat and riverine

resources and to document the degree of change to provide feedback to the Adaptive Management Component of the Proponent's Proposed Project and Alternative 1 makes logical sense. Use of the monitoring results, especially concerning Reach 4 and the reaches further downstream, would influence future sluicing events. The Fish Passage Management Committee, of which NMFS would be part, would make decisions based on information received though monitoring. Results of the evaluation would be used to refine sediment management options to support fish passage and to address potential options to manage sediment delivery to the downstream river channel through a determination of which tool to employ. Please refer to the revised SOMP (Appendix J).

Comment FI-47b

Second, there is nothing in the protocols for the sluicing operations and management plan which clearly indicates to what level the impacts associated with this aspect of the proposed project would be reduced.

Response

Please refer to the response to FI-47a, above, and to the revised SOMP (Appendix J).

Comment FI-47c

Given the existing severely depressed populations of steelhead in the Carmel River, and the role of the Carmel River in the recovery of the S-CCC DPS, the vague mitigation measure proposed is not adequate to make a determination of "no significant impact".

Response

Based on updated modeling conducted in response to this, and other comments, the finding under FI-9a (Sediment Impacts to Downstream channels from Sluicing, Dredging or Sediment Transport Downstream) has been changed to less than significant for the Proponent's Proposed Project and Alternatives 1 and 3. Alternative 2and 4 are significant and unavoidable for the short term. Both Alternatives 2 and 3 are beneficial in the long-term.

Comment FI-47d

Further, a finding supporting a statement of overriding considerations must address both the threatened status of the S-CCC DPS and the expected role the Carmel River will have in the recovery and delisting of the DPS.

Response

A Statement of Overriding Considerations is neither part of the Draft nor Final EIR/EIS. In accordance with CEQA, this Statement would be prepared by the California Department of Water Resources, before approving a project and filing of a Notice of Determination. In order to complete the CEQA process, it is not necessary for the State of California to prepare a document meeting the requirements of a Recovery Plan under

ESA. Protection measures for listed steelhead under the selected alternative would be incorporated during permitting, as part of the Section 7 consultation.

Comment FI-47e

Address the fact that the severely depressed steelhead run in the Carmel River is one of the principal reasons the S-CCC DPS has been listed by NMFS as threatened under the ESA.

Response

The status of Carmel River steelhead is discussed in detail in Sections 4.4.1.3 and 4.4.1.5 of the Draft EIR/EIS and Final EIR/EIS.

Comment FI-47f

Include a discussion on the long-term adverse impacts to listed steelhead (by direct mortality), fish passage and habitat downstream from the long-term sluicing operations as part of the Proponent's Proposed Project and Alternative 1; include a discussion on the long-term adverse impacts to listed steelhead (by direct mortality), fish passage and habitat downstream from the long-term sluicing operations as part of the Proponent's Proposed Project and Alternative 1.

Response

In the Final EIR/EIS, Table 4.4-11 quantifies the length of channel (in feet) and provides an estimate of the number of steelhead affected by the different alternatives for construction and operation. The table also provides an estimate of the percent of steelhead habitat affected in the long-term under the entries opposite the "Operations" rows. This table is discussed in Section 4.4.3 for the different alternatives.

Comment FI-47g

Address how the Proponent's Proposed Project and all of the alternatives will affect the restoration of the Carmel River steelhead run.

Response

The purpose and need of the action which the Final EIR/EIS evaluates is to provide dam safety, not to recover steelhead in the Carmel River. Project effects on the Carmel River steelhead are discussed in detail throughout Chapter 4.4.

Comment FI-47h

Provide analyses that demonstrate the Proponent's Proposed Project and Alternative 1 will not further the decline of the Carmel River steelhead run.

Response

Please refer to the responses to comments FI-46 and FI-47f, above.

Comment FI-48

The analysis of the sluicing operations' impacts downstream of the dam focuses on the physical behavior of the sediments. However, the analysis does not specifically address the impacts on fisheries or other aquatic resources. This lack of analysis is significant because it is principally the effects of discharged sediments (particularly fine sediments) in an artificial manner (timing, amount, duration and composition) on aquatic resources that is the focus of the CEQA analysis. In addition to steelhead, potentially affected aquatic resources include benthic invertebrates and rooted aquatic vegetation.

Response

Please refer to the revised SOMP (Appendix J). Impacts are assessed in Table 4.4-10 and 4.4-11 and discussed in Section 4.4.3 under FI-6, FI9a, and FI-9b.

Comment FI-49

The characterization of the sediment sluicing operations as causing only a "short-term increase in the sediment load to the downstream river" is misleading. While the immediate principal impacts of the sediment sluicing may be concentrated in a relatively short period each year, the sluicing operations are proposed in perpetuity and will be necessary in perpetuity, or at least for as long as the San Clemente Dam is in place. Consequently, the real impacts can only be evaluated on a cumulative basis. At a minimum, adult steelhead migrating upstream, benthic invertebrates, incubation of steelhead alevins, rearing/feeding of juvenile steelhead and steelhead spawning in the lower reaches of the Carmel River downstream of the San Clemente Dam will be adversely impacted in perpetuity by the sluicing operations.

Response

The difference between the short-term increase in sediment loads and the long-term effects of the existing dam is distinguished and evaluated in Section 4.4.3 under Fisheries Impact FI-9a for the Proponent's Proposed Project and each Alternative. Sediment would begin passing over the Dam under existing conditions, within six to ten years, even under the No Project Alternative and silt, sand and gravel would pass downstream into the river below and would continue to do so in perpetuity. Sediment sizes gradually would shift from finer materials to coarser materials over time. Sluicing would have a short-term impact by: 1) beginning to pass sediment downstream earlier than would otherwise occur and 2) slightly advancing the timing of the sediment that would be passed downstream for the storm event in which sluicing occurs. The overall impacts of sluicing to maintain fish passage would be a minor short-term shift in sediment transport past the dam. Sediment transport would be reinitiated to a greater degree under Alternative 1 and much more rapidly restored under Alternatives 2 and 3. For Alternatives 1, 2 and 3, initial larger volumes of fine sediment would be released downstream from reworking the sediment behind the dam than would occur with the Proponent's Proposed Project and No Project. Sediment transport past the dam should be evaluated against the long-term background effect of sediment being passed

downstream of San Clemente Dam under existing conditions and the No Project Alternative. Please refer to the revised SOMP (Appendix J).

Comment FI-50

The Proponent's proposed standard regarding the timing of sediment sluicing (i.e., ceasing sediment sluicing if 20 or more steelhead have passed the ladder in the previous two days) is arbitrary. Since it is arbitrary, the proposed standard could conflict with the basic objective of sediment sluicing: control sediment build-up in the river channel in the reservoir immediately above the San Clemente Dam to facilitate adequate steelhead passage opportunities through the fish ladder. It bears mention that in some years the number of steelhead proposed as the "cease sluicing standard" has constituted a significant portion of the total Carmel River steelhead run in a single month.

Response

We have eliminated this standard from the revised SOMP. The standard was developed based on an analysis of daily ladder counts at SCD from 1993 to 2004. The fish passage data indicate that when daily steelhead counts reached at least 20 fish, a series of days followed where counts were equal or higher. The objective of this standard was to avoid sluicing when potentially large numbers of adults were in the river downstream of SCD. Please also refer to the revised SOMP (Appendix J) in the Final EIR/EIS.

Comment FI-51

As noted in the Sluicing Operations and Maintenance Plan, high turbidity and suspended sediment are potentially the most significant hazards to adult steelhead migrating up the Carmel River. Swimming performance of adult (and juvenile) salmon can be impaired by poor water quality. Migrating salmonids avoid waters with high silt loads, or cease migration when such loads are unavoidable. A large portion of the Carmel River adult steelhead population would be exposed to these effects based on the estimate that about one half (55 percent) of the adults that enter the Carmel River may move upstream of the San Clemente Dam.

Response

The Carmel River already experiences naturally high turbidity or suspended sediment loads during storm events. The primary water quality characteristics potentially affected by sluicing would be turbidity and suspended sediment. Sluicing events would be short-term (occurring over periods on the order of hours). Since sluicing would occur on the rising limb of the hydrograph, sediment released during sluicing would be mobilized by the storm flows that follow. Sluicing would result in a minor shift in timing, concentration and duration of levels of turbidity and suspended sediment**.**

Turbidity and suspended sediment would be locally higher just below the Dam during the time of sluicing and for a period of time following sluicing until the turbidity created by storm flows meets or exceeds the turbidity from the sluicing event. Sediment that is sluiced would either be carried downstream, or temporarily deposited in the plunge pool or along the edge of the water along the river below the Dam. Sediment that has been deposited in the plunge pool would be resuspended by the increasing storm flows and carried downstream. Thus, the effects of increased suspended sediment and turbidity due to sluicing would be localized in time and space. Sluicing would not expose the entire run of steelhead to higher levels of turbidity or suspended sediment because: (1) the impacts would be restricted primarily to upstream of Reach 4 and (2) sluicing would only occur for a matter of hours a few times a season so the entire run would not be affected. Please refer to the revised SOMP (Appendix J) for more detail.

The estimate that about half the adults that enter the river move upstream of the Dam is based on very limited tagging from a study done for only a single year in the mid 1980s when harvest was allowed on the river and should not be used to represent current conditions.

Comment FI-52

When water quality conditions are impassable to fish, their upstream movement is delayed for as long as that condition persists. Delayed fish may expend the stored energy necessary for successful migration, maturation and spawning before reaching their destination, resulting in weakened fish more disposed to disease or pre-spawning mortality. Delayed adult upstream migration is another stressor added to a population that has already declined significantly.

Response

Thank you for your comment. Comment noted. Impacts to fisheries are discussed in Section 4.4.3 of the Final EIR/EIS.

Comment FI-53

The Draft EIR/EIS notes that suspended sediment levels as a result of sluicing would impair the ability of steelhead to see and feed, would impair homing, delay migration and cause physiological responses ranging from stress to death depending on the level of suspended sediment and duration of exposure. Larval steelhead and eggs would also be affected. These effects to all steelhead life stages will occur in perpetuity and the Draft EIR/EIS fails to analyze these effects to the Carmel River steelhead population in perpetuity. For instance, adults, juveniles, eggs and larval steelhead may experience severe habitat modification and up to 40 percent mortality. The proposed mitigation (e.g., the Sluicing Operations and Maintenance Plan and an evaluation to determine downstream effects) is insufficient to mitigate the high levels of mortality and severe habitat degradation that will occur in perpetuity.

Response

The analysis in the EIR/EIS was based upon modeled sediment being transported through the sluiceway and has been updated for the Final EIR/EIS. Suspended sediment and turbidity levels would fall dramatically once the sluiced sediment enters the plunge pool. The effects to steelhead adults and juveniles would be similarly reduced. Please refer to the revised SOMP (Appendix J) which will be implemented as an adaptive management plan conducted in consultation with NMFS and other appropriate agencies.

Comment FI-54

The Sluicing Operations and Maintenance Plan notes steelhead throughout their range frequently encounter migratory obstructions (e.g., beaver dams, cascades, logjams) which delay migration, but that such delays usually don't affect the ultimate reproductive capacity of the fish. NMFS agrees that relatively small natural barriers are well adapted to by steelhead. However, the scale of the proposed sluicing operations and the resultant effects downstream – high turbidity and suspended sediment – are profoundly unnatural in the Carmel River.

Beaver dams and logjams are likely temporal obstructions. The sluicing operations are proposed in perpetuity and will be necessary in perpetuity, or at least for as long as the San Clemente Dam is in place. Therefore, delays to adult migration will occur for as long as sluicing operations are conducted.

Response

It is true that sediment management would occur as long as the San Clemente Dam remains in place. Based on revised studies conducted, in part in response to requests from NOAA, effects downstream from sluicing are minimal and not significant. Please refer to the revised SOMP (Appendix J) and the responses to comments FI-47c, FI-49, FI-51 and FI-53, above.

Comment FI-55

The Draft EIR/EIS notes that the first storms of the season and the first opening of the Carmel River lagoon sandbar control the initial adult steelhead upstream migration.

Response

Thank you for your comment. Comment noted. This information is found in the Final EIR/EIS Section 4.4.1.7.

Comment FI-56

The Draft EIR/EIS states that, "ideally, the first sluice event for a given year would occur prior to the initial (adult upstream) steelhead migration, depending on the timing of storms." It is unknown in how many years the first sluice event will occur prior to the initial steelhead migration. NMFS is concerned that adult steelhead migrating upstream

will be affected by the first (and all) sluicing events as there is no certainty in predicting when sluicing events will occur and no assurance that initial adult upstream migrants will not be present during the first sluicing period in any given year.

Response

Please refer to the revised SOMP (Appendix J) in the Final EIR/EIS. A fish passage channel would be proactively established by dredging prior to the start of the migration season. The channel would then be maintained by sluicing. If dredging and sluicing do not eliminate the impairment to upstream migration, adults would be captured from the ladder and released upstream of obstruction.

Comment FI-57

NMFS has determined the Proposed Sluicing Decision Tree in the Sluicing Operations and Maintenance Plan is too simplistic and does not account for all the unforeseen and unpredictable events that can occur each year. Each step in the Decision Tree asks questions that are difficult, if not impossible, to answer accurately. Questions raised for each step follow. **(Also SED-47)**

Comment FI-57a

Is sediment delta passage a problem?

How will passage problems be determined? When will it be determined when sluicing is to occur? Making a determination before the winter migration period may be inaccurate due to changing conditions behind the reservoir once high flows begin. Please clarify how channel depth and width within the reservoir will be measured during the high flow season in order to initiate sluicing. Since steelhead tend to migrate on the descending limb of a storm, how feasible and safe is it to place crews out on the reservoir to measure channel dimensions during storm events? **(Also SED-47a)**

Response

Please refer to the revised SOMP (Appendix J). Passage would be determined from observations made of upstream channel conditions. During winter high flows, depth of flow through the reservoir to the Dam has rarely been a problem. Crews would periodically examine the channel upstream from the fish ladder for signs of standing waves or riffles indicative of bars or shoaling. It is not safe to place crews out on the water during high flow events, but it would be possible to install a floating suction dredge that could be operated remotely using cables strung across the back of the Dam upstream of the fish ladder opening.

Comment FI-57b

If sediment delta passage is a problem, but increasing flows are predicted not to exceed 300 cfs, sluicing will not occur.

However, passage has already been determined to be impacted. How will fish pass through the blocked sediment delta during their migration before a sluice event has been performed? These delays need to be addressed. **(Also SED-47b)**

Response

Please refer to the revised SOMP (Appendix J) which would employ two other tools, including dredging upstream sediments or trapping and trucking the fish from the ladder and moving them around the obstruction. At the approach of the migration season, a channel would be prepared with sufficient width and depth to allow passage to occur from the ladder upstream into the Carmel River or San Clemente Creek. The occurrence of flows at the Dam would not necessarily indicate that there would be sufficient surface flow in the lower river to connect with the lagoon or the ocean, at least with the existing overdraft occurring in the Carmel Valley aquifer. A flow of only 300 cfs at SCD would not be sufficient to open the mouth of the Carmel River during the fall when the river is recharging; therefore passage at SCD would not normally become an issue at these flows.

Comment FI-57c

Is it peak migration season?

Peak migration season is generally between February and March, however, it depends on the hydrologic cycle as to when the majority of fish migrate. **(Also SED-47c)**

Response

Additional text has been added to section *4.4.1 Environmental Setting / Adult Run Timing,* last paragraph, to summarize and clarify peak migration season in the Carmel River and at SCD.

Comment FI-57d

Will a passage problem potentially develop during the next storm event?

How will this be determined? It is unknown how large or small the next storm event will be and how much sediment will be carried into the reservoir. **(Also SED-47d)**

Response

Please refer to the revised SOMP and response to Comment FI-57b.

Comment FI-57e

It has already been determined that passage is a problem in the first step. But if a significant storm event is not predicted, sluicing will not occur and blocked passage will continue to delay migration. **(Also SED-47e)**

Response

Dredging would be used to establish and maintain passage in the event of no or limited storm flows. If blockage still occurs adult fish would be captured in the ladder and moved upstream of the obstruction. Please refer to the revised SOMP (Appendix J).

Comment FI-57f

Have 20 or more fish ascended the ladder in the past 2 days?

Per our April 5, 2006, letter, NMFS believes the decision whether 20 or more fish have ascended the ladder is an arbitrary number. Please clarify how this number was determined to be a defining point to sluice or not. **(Also SED-47f)**

Response

We have eliminated this standard from the revised SOMP. The standard was developed based on an analysis of daily ladder counts at SCD from 1993 to 2004. The fish passage data indicate that when daily steelhead counts reached at least 20 fish, a series of days followed where counts were equal or higher. The objective of this standard was to avoid sluicing when potentially large numbers of adults were in the river downstream of SCD. Please refer to the revised SOMP (Appendix J).

Comment FI-57g

If this number of fish has ascended the ladder, sluicing will not occur even though a passage problem potentially will occur during the next storm event. This is a large number of steelhead to be trapped in the sediment delta without being able to move upstream. The impact of delay to these fish needs to be addressed. **(Also SED-47g)**

Response

We have removed this standard from the protocols. Please refer to the revised SOMP and the response to FI-50. Fish passage would be managed proactively using three tools, sluicing, dredging and trap and truck.

Comment FI-57h

Increasing flows likely to exceed 300 cfs?

Future hydrologic conditions are very difficult to predict. Basing management decisions (when sluicing is to occur) on unpredictable occurrences is unacceptable. **(Also SED-47h)**

Response

We have eliminated this standard from the revised SOMP. The standard was developed based on an analysis of daily ladder counts at SCD from 1993 to 2004. The fish passage data indicate that when daily steelhead counts reached at least 20 fish, a series of days followed where counts were equal or higher. The objective of this

standard was to avoid sluicing when potentially large numbers of adults were in the river downstream of SCD. Please refer to the revised SOMP (Appendix J).

Comment FI-57i

Storm precipitation predicted to be significant?

Please refer to comment above. Although predicting storm events is becoming easier, storm intensity is unknown until the storm is actually occurring. **(Also FI-47i)**

Response

Please refer to the revised SOMP. Operations would depend on realtime data from rain gages installed in the upstream watershed.

Comment FI-57j

Is flow still increasing past 300 cfs?

How long does it need to keep increasing past 300 cfs? This is unpredictable. **(Also SED-47j)**

Response

Please refer to the revised SOMP. Actual operation would depend on realtime data on rainfall and streamflows upstream of SCD. Review of storm hydrographs indicate that flows continue to increase well past 300 cfs, rapidly reaching the flow limit within a matter of hours. The Carmel River hydrographs show rapid increases in flows in response to rainfall. These conditions are predictable based on existing information and would be refined in practice with realtime rainfall and streamflow data.

Comment FI-57k

Continue sluicing until time limit, incision goal, or flow limit is reached. What is the time limit for sluicing?

Please clarify how channel depth and width within the reservoir will be measured during the high flow season in order to determine that enough sediment has been sluiced to provide for passage. What is the flow limit? **(Also SED-47k)**

Response

Please refer to the revised SOMP. The flow range for sluicing is between about 300 and 700 cfs. The time limit would be based on the amount of material to sluice. There would be no reservoir, only a flowing channel and a remnant pool. Depth for fish passage would be determined by examination of the channel for conditions that would impair passage, such as shallow water and high velocities, such as would occur at a riffle.

Comment FI-57l

If flow is not increasing past 300 cfs, abort, re-open fish ladder.

How many aborted sluicing events will occur causing unnecessary delay to fish migration throughout the season due to the inability to predict hydrologic events to induce sluicing? **(Also SED-47l)**

Response

Please refer to the revised SOMP (Appendix J). If sluicing can't occur, the channel could be dredged to provide access, but this would be necessary only if passage was impaired.

Comment FI-58

Refer to Table 2.1, FI-4, NMFS recommends adding "short-term" to impacts under Alternatives 2 and 3.

Response

Table 2.1 will be revised to reflect comment.

Comment FI-59

Refer to Table 2.1, FI-7, NMFS recommends adding "long-term, significant, unavoidable" to impacts under the Proponent's Proposed Project.

Response

The fish ladder closure is a temporary impact; the new ladder would be an improvement over the existing conditions. See revised discussion regarding Impact Issue FI-7 in Section 4.4.

Comment FI-60

Refer to Table 2.1, FI-7, NMFS recommends adding "short-term" to impacts under Alternatives 1, 2 and 3.

Response

Table 2.1 will be revised to reflect comment.

Comment FI-61

Refer to Table 2.1, FI-8, NMFS recommends FI-8 should include sluicing impacts on upstream fish migration. For the Proponent's Proposed Project and Alternative 1, it would be long-term unavoidable significant impacts, as well as beneficial with new fish ladder. NMFS suggests F1-8 may need to be separated into two separate impacts: sluicing impacts on upstream fish migration and beneficial effects of a new fish ladder.

Response

In the Draft EIR/EIS, Impact Issue FI-8 discussed the effects of the new fish ladder (including use of the SOMP and its affects on upstream migrating steelhead) and FI-9 discussed the effects of sluicing to downstream channels. The Final EIR/EIS reflects this division of issues, although Impact Issue FI-9 has been divided into FI-9a which discusses sluicing, and FI-9b which discusses other sediment management methods. The impact determinations for FI-8 for the Proponent's Proposed Project and Alternative 1 are long-term beneficial. Based on additional studies, the determination for FI-9a for all action alternatives, except for Alternative 2, is less than significant. Also see Table 2.1 and Impact Issues FI-8 and FI-9a in Section 4.4.

Comment FI-62

Refer to Table 2.1, FI-9, NMFS recommends FI-9 should include only sediment impacts to channels downstream (i.e., impacting redds and steelhead habitat). For the Proponent's Proposed Project and Alternative 1, NMFS recommends adding "long-term" and FI-9 should not include impacts to upstream migration from sluicing.

Response

Downstream impacts from sluicing would be temporary due to the fine sediment that would be initially sluiced downstream. Over time the sediments would become coarser and would be beneficial over the long-term. Issue FI-9a does not include impacts to upstream migration from sluicing. Those are addressed in Issue FI-8. See Response to comment FI-61 regarding impact determinations.

Comment FI-63

Refer to Table 2.1, FI-12, NMFS recommends changing, "Long-term improvement to fish passage over the dam" to "Long-term effects to fish passage over the dam." All other impacts do not refer to improvement, only reduction, degradation or effects. NMFS recommends consistency.

Response

Agreed, Table 2.1 will be revised to reflect comment.

Comment FI-64

Refer to Table 2.1, FI-12, NMFS recommends adding "long-term" to impacts under Alternatives 1, 2 and 3. NMFS has determined that dam removal is much more beneficial for steelhead than having a fish ladder. NMFS is unclear how the impacts of dam removal and a fish ladder can be distinguished from each other when they are not equal in impacts, yet both purport to have long-term beneficial impacts.

Response

The discussion of Impact Issue FI-12 concerns the improved fish ladder and spillway modifications and does not apply to dam removal Alternatives 2 and 3. In the Final EIR/EIS Table 2.1 (and the discussion on Impact Issue FI-12) has been revised to show that the impact does not apply to the dam removal Alternatives 2 and 3. The determinations for the Proponent's Proposed Project and Alternative 1 do include "long-term" in the descriptions.

Comment FI-65

Refer to page 2-39, NMFS recommends adding "long-term" while describing significant unavoidable impacts to water quality and fish. **(Also WQ-6)**

Response

Impacts from sluicing, although intermittent and temporary, are considered long-term because they will occur throughout the continued operation of the Dam. Although fine sediment will be transported initially, over time, the sediments would become coarser and would be beneficial over the long-term.

Comment FI-66

Refer to page 3-35, NMFS is unclear whether dredging upstream of the reservoir every three years will be needed along with sluicing. Please clarify and analyze all impacts to steelhead in the reservoir if dredging is to occur. **(Also AA-46)**

Response

Please refer to the revised SOMP (Appendix J) and Impact Issues FI-8, FI-9a and 9b in Section 4.4.3 of the Final EIR/EIS. Dredging is discussed primarily in FI-9b and would be used to establish a fish passage channel prior to the beginning of the migration season.

Comment FI-67

Referring to page 4-83, (Issue WQ-6: Stream Diversions Return of Bypassed Flows) the mitigation for this effect is to install energy dissipaters where the water is discharged back into the river. Bypass pipes must either be sized to provide for fish passage of juveniles or juveniles need to be trapped and moved around the diversion continually throughout the entire construction period. If trapping is not implemented, dissipaters cannot be installed on the end of the diversion pipes since they would obstruct fish passage. Please refer to also Issue FI-4: Diversion of Carmel River and San Clemente Creek around San Clemente Reservoir for Construction Purposes, page 4-131.

Response

As indicated on page 4-131 in the Draft EIR/EIS and in Section 4.4.1 under the subsection on Sleepy Hollow Steelhead Rearing Facility in the second paragraph after

Table 4.4-6 in the Final EIR/EIS, the diversions would be screened and fish traps would be installed.

Comment FI-68

Referring to page 4-85 (Issue WQ-9: Reservoir Drawdown), the Draft EIR/EIS states, "The effects of drawdown under the Proponent's Proposed Project would likely be greater than has been observed during the 2003 to 2005 drawdowns because drawdown rate would be faster." The Mitigation for this Impact goes on to state, "The reservoir water level would be drawn down at a relatively slow rate (about 0.5 feet or less per day), similar to that currently being used for the annual drawdown (an interim dam safety measure). Please be consistent on the effects of the drawdown.

Response

The average drawdown rate would be consistent with 2003 to 2006 drawdown rates, however, pumps would be installed and the reservoir lowered at a constant rate that is different from the 2003 to 2006 drawdown, which was regulated by the operation of the drawdown ports. With the loss of head, it would become more difficult to draw the reservoir down below a certain level. The rate of drawdown would be increased for the lower elevations compared to the 2003 to 2006 drawdowns.

Comment FI-69

Refer to page 4-135 (Issue FI-8: Upstream Fish Passage): it was determined upstream fish passage would be beneficial with the improved fish ladder. However, page 5-2, 5.1.4 Aquatic Biology, states, "Adult fish may fallback over the dam during sluicing." Please address this fallback impact for the Proponent's Proposed Project and Alternative 1. NMFS expects this would be a long-term significant and unavoidable impact.

Response

Fallback would occur when a fish that had ascended the ladder become entrained in the flows in front of the sluice gate. Measures would be taken under these two alternatives to avoid this impact by closing the ladder and attempting to move adults from in front of the sluiceway prior to fully opening the gate.

Comment FI-70

Refer to page 4-136 (Issue FI-9: Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream): NMFS recommends changing the determination to "Significant, unavoidable, long-term".

Response

Impacts from sluicing, although intermittent and temporary, are considered long-term because they will occur throughout the continued operation of the Dam. Although fine

sediment will be transported initially, over time, the sediments would become coarser and would be beneficial over the long-term.

Comment FI-71

The Impact discussion only addresses the sluice gate operation in front of the fish ladder. There is another proposed sluice gate to keep the intake valve clear of sediment. Please discuss fish impacts from operations of the sluice gate for the intake valve. How often and for what duration will this sluice gate be operated? How much sediment will be sluiced at a time? How will fish be kept from entrainment? Determine if these impacts will be cumulative to the impacts from the fish ladder sluice gate.

Response

There would not be second sluiceway. The project description has been revised to reflect this change. The intake tower would be moved near the existing sluiceway.

Comment FI-72

Refer to page 4-139, the last paragraph under Impact discusses degradation of habitat conditions in Reaches 4, 5, and 6. Please clarify that this would be an annual impact to this habitat each time the sluice gates release sediment and therefore 37 percent of the juvenile fish and 35 percent of the habitat downstream of San Clemente Dam would be adversely impacted each year in which sluicing occurs. These impacts will be on-going for the life of the project.

Response

Please see the revised SOMP (Appendix J). Sediment released through sluiceway would initially be sand and would begin to coarsen to gravel and cobble as the upstream bed composition changes. This would occur with or without the sluicing as sediment would begin to move past the Dam within six to ten years. For all alternatives there would be an initial period of fine sediment transported downstream, followed by a period where sediment sizes would coarsen. For all alternatives there would be an initial impact to the 37 percent of juvenile fish and 35 percent of the habitat in reaches 4, 5 and 6 downstream of SCD followed by an improvement to habitat conditions in these reaches. The duration of the impact is expected be slightly longer for the Proponent's Proposed Project compared to Alternative 1. In addition, the impacts incurred under Alternative 1 would last slightly longer than the impacts under Alternative 2 which would last longer than impacts incurred under Alternative 3. Alternative 3 would have the least amount of fine sediment released downstream because the footprint of the exposed reservoir area would be the smallest of all the Alternatives.

Comment FI-73

Refer to page 4-146 (Issue FI-12: Downstream Fish Passage over SCD, Impact, the Draft EIR/EIS states, "Passing through the notch at this elevation would expose fish to higher potential to contact the spillway surface as compared to passage over the

present spillway." It is unclear to NMFS if the mitigation of creating a low flow channel would prevent contact with the spillway surface or if this impact would still occur. Please clarify. If the impact will still occur, NMFS does not expect this to be a beneficial, long-term impact, but a significant, unavoidable, long-term impact.

Response

Creating a low flow notch in the notched dam would direct the low flows through a small cross section, increasing the depth of flow and minimizing the potential for fish to contact the spillway and incur injury. It would not completely eliminate the possibility for fish to contact the spillway because as flows increase, spill would occur across the entire notch at some point and fish could contact the spillway surface. However, it minimizes the amount of time that fish would be exposed to shallow depth of flow when conditions would more likely produce injury. For this alternative, all flows up to 55 cfs would pass through the fish ladder greatly reducing the potential for injury to fish. This, in combination with the low flow notch would greatly reduce the risk of abrasion from the spillway. Thus, it represents a beneficial change from existing conditions.

Comment FI-74

Refer to page 4-147 (Issue FI-13: Stream Sediment Removal, Storage, and Associated Restoration): the determination is Significant, unavoidable, long-term; however, under the Impact discussion it states this impact would only occur during construction and restoration and would be a "temporary loss of steelhead habitat." NMFS recommends changing the determination to "Temporary".

Response

In the Final EIR/EIR, Impact Issue FI-13 has both short-term and long-term impact determinations. The short-term impact determination for Alternatives 1, 2 and 3 is significant and unavoidable. For Alternative 1, the long-term impact is less than significant and for Alternatives 2 and 3, the long-term impact is beneficial. This reflects the fact that there is an initial loss of habitat that is recovered over time through revegetation.

Comment FI-75

Refer to page 4-152 (Issue FI-9: Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream): NMFS recommends changing the determination to "Significant, unavoidable, short-term; beneficial long-term".

Response

For the Final EIR/EIS, additional analysis was conducted on sediment impacts in response to requests by NOAA and others. As a result, the impact determinations for this impact issue (now FI-9a) is less than significant for the Proponent's Proposed Project and Alternative 1; short-term significant and unavoidable, long-term beneficial

for Alternative 2; and short-term less than significant, long-term beneficial for Alternative 3.

Comment FI-76

Refer to page 4-157 (Issue Comment FI-9: Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream): it is NMFS' understanding from the Project Description that sluice gates will not be installed for the No Project Alternative. The second paragraph discusses impacts to fish from sluicing operations as the same for the Proponent's Proposed Project. Please clarify if sluice gates will be installed for the No Project Alternative or remove the discussion of sluice gates.

Response

In order to maintain consistency with the CEQA and NEPA Guidelines and the September, 2005 Notice of Preparation filed by the Department of Water Resources, the fish ladder and sediment management are no longer considered part of the No Project alternative. The Final EIR/EIS has been changed to clarify this.

Comment FI-77

Refer to page 5-23, 5.5 (Relationship Between Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity): NMFS expects the Final EIR/EIS will include a discussion on the long-term adverse impacts to listed steelhead (by direct mortality), fish passage and habitat downstream from the long-term sluicing operations for the Proponent's Proposed Project and Alternative 1 (see comment above in the South-Central California Coast Distinct Population Segment Steelhead section of this letter).

Response

In response to this, and other comments, an additional evaluation of the effects of sluicing, based on sediment transport analyses prepared by MEI (2007a and 2007b), was conducted. Please refer to Sections 4.2 and 4.4 of the Final EIR/EIS, and the revised SOMP (Appendix J), for the additional information.

Short-term impacts from sluicing include exposure to turbidity and suspended sediment throughout Reach 4 and delays in the ladder during sluicing operations. The delay to upstream migration would occur if steelhead are in the ladder and are unable to exit the ladder for the period of time sediment is being sluiced. Exposure to suspended sediment by sluicing is discussed under Impact Issue FI-9a and in this response to comments under Impact Issues FI-78 and FI-79. In the Final EIR/EIS, Tables 4.4-10 and 4.4-11 have been included to summarize impacts to the habitat.

April 5, 2006 letter from Dick Butler / NMFS

Comment FI-78

NMFS has two general concerns with the draft SCD Seismic Safety Project EIR/EIS. The most significant concern is the large amount of take of listed species we believe will occur from the proposed sluice gate operations included in the Proponent's Preferred Project (buttressing) and Alternative 1 (notching), as described in the EIR/EIS. Available information indicates the take of steelhead will be in the form of mortality, severe sub lethal effects, and delayed adult migration every year. The other concern relates to differences between the Evaluation of Sediment Sluicing Options Associated with the San Clemente Dam Fish Ladder (Mussetter Report) from March 16, 2006, which modeled how sediment would be managed by the sluice gate and its downstream impacts, and the Sluicing Operations and Maintenance Plan (O and M Plan).

The sluice gate operations will pass 2 to 4 acre-feet (AF) of sediment, possibly exceeding 10 AF, with each sluicing during winter migratory periods. It is anticipated that for the next 12 to 20 years, (3 to 5 steelhead generations), sediment passed via sluicing will be predominantly fine grained and, subsequently, the suspended sediment concentrations below the dam would exceed lethal levels to steelhead. Sediment can be lethal to steelhead and their eggs by physiological means (gill trauma, interruption of osmoregulation, and cessation of reproduction and growth) and impacted habitat (reduced spawning habitat, reduced interstitial flow, entombing redds, and elimination of food sources). During high flow events, steelhead often seek shelter from high velocities along the bottom of the river channel, where suspended sediment concentrations are expected to exceed 20,000 mg/L during sluice events. This would exceed lethal levels as reported by Newcomb and Jensen (1996). Additionally, suspended sediment concentrations will fluctuate depending on the quantity of sediment released, but Mussetter's Report didn't provide a range of suspended sediment concentrations for sluicing of between 2 AF and 10.5 AF, which will need to be included in the final EIR/EIS. Furthermore, research in other systems (Bergstedt and Bergersen 1997) indicates that smaller quantities of sediment releases could increase suspended sediment concentrations to over 200 times their pre-sluicing levels for several days up to 29 km downstream (approximately the distance between SCD and the mouth of the Carmel River), again exceeding lethal limits. Essentially, the operation of the sluice gates will kill between 20 and 60% of migrating adults, migrating smolts, and rearing juveniles in the lower 18.5 miles of the Carmel River, several times a year, every year, until the dam is removed or the fish are extirpated. Clearly, this proposed action is not beneficial to steelhead and we strongly disagree with the "beneficial" determination in the EIR/EIS.

Response

In response to this, and other comments, an additional evaluation of the effects of sluicing, based on sediment transport analyses prepared by MEI (2007a and 2007b), was conducted. The sediment sluicing analysis conducted for the Final EIR/EIS was

agreed on by a Core Team of lead and cooperating agencies, including NMFS. Please refer to Sections 4.2 and 4.4 of the Final EIR/EIS, and the revised SOMP (Appendix J), for the additional information.

The suspended sediment concentration in the Carmel River downstream of the damsite is a function of the sediment transport capacity of the river and the available sediment load. Following removal of the Dam (Alternatives 2 and 3), the full background sediment load would be available for transport downstream within the limits of the transport capacity.

With the Dam in place under the Proponent's Proposed Project, about 65 percent of the background load would be available downstream of the Dam. Under the notched Dam alternative (Alternative 1), about 83 percent of the background load would be available in the lower river. This amount of sediment would be augmented in the short-term by any sediment that was sluiced. The volume of sediment sluiced at any time would be related to the sediment management decisions outlined in the revised Sediment Operation and Management Plan for Fish Passage (Appendix J).

Overall, the controlling factor would be the sediment transport capacity of the river. If sediment is sluiced, it would only flow downstream within the limits of the transport capacity of the river. If the sluiced sediment plus the background load exceeded the transport capacity, the excess material would drop out and would only be re-suspended when the transport capacity increases or the sediment supply decreases (sluicing stops). Please also review the response to comment SED-42.

Since the Dam is nearly full of sediment, the next three to five generations of steelhead would experience sediment moving past the Dam within the next six to ten years whether there is sluicing or not. The impacts to steelhead would occur under future conditions with no project. Sluicing would only induce a short-term change in the timing of some of the sediment being moved past the Dam.

SOMP: The analysis of suspended sediment was based on the maximum modeled suspended sediment concentrations. These concentrations are based upon the maximum load that the river can carry and not actual loads measured from the river and therefore represent the worst case scenario. The values evaluated in the EIR/EIS examined the maximum levels (about 20,000 ppm at a flow of about 4,000 cfs) and applied these concentrations to potential sluicing times of up to two days. The suspended sediment concentrations and duration was used to represent the worst case scenario. These concentrations and durations were then applied to the severity of ill effects (SEV) model developed by Newcombe and Jensen (1996). These values represent the absolute maximum suspended sediment values that would occur in the river under existing conditions given the maximum amount of sediment that could be transported by the river.

During the 2003 drawdown, a relationship was developed between suspended sediment concentration, streamflow and turbidity in the river about 450 feet downstream of SCD (ENTRIX 2003). The suspended sediment load in the river was measured at a maximum of about 50 mg/l (mg/l is equivalent to ppm) at a flow of about 30 cfs. The maximum suspended sediment load is about 3,500 ppm at a flow of 50 cfs. Based upon this information, the modeled maximum suspended sediment loads, at least at the lower end of the flow spectrum, could be up to two orders of magnitude higher than what actually occurs in the river.

Sluicing would occur only between flows of 300 to 700 cfs. Therefore, a more realistic analysis would evaluate the suspended sediment concentrations associated with these flows. An evaluation would analyze suspended sediment concentrations of 5,000 to 7,000 ppm for flows of 300 to 700 cfs. Concentrations in this range for an exposure of up to 7 hours result in SEV scores of 6, 7, 8 or 9 (from Newcombe and Jensen 1996) (Table 4.4-8). SEV scores of 6 to 8 are classified as Sub lethal Effects, and described as moderate to major physiological stress, habitat degradation, and long-term reduction in feeding rate and feeding success. An SEV score of 9 is classified as a Lethal or Paralethal Effect. However, level 9 is described as reduced growth rates, delayed hatching and reduced fish density (Table 4.4-8). If in-river suspended sediment loads are one to two orders of magnitude less, the SEV scores would fall into the Behavioral and Sub lethal Effects ranges.

Direct comparison of Bergstadt and Begerstom (1997) that addressed a sluicing event on the Wind River in Wyoming is not at all comparable to the Carmel River for the following reasons: the geology of the Wind River basin is sedimentary compared to the Carmel River which is principally granitic. Sluicing occurred 25 times and 32 times during the low flow period for the two years studied. Sluicing was for the purpose of maintaining a large agricultural diversion, not to sustain fish passage. The volume of sluiced sediment was far in excess of what is being proposed for operations at San Clemente Dam.

The SOMP (Appendix J) would be implemented as an adaptive management plan and would be carried out in consultation with NMFS and other appropriate agencies so that changes in operation can be made based on real-time knowledge, experience and agency concerns.

Comment FI-79

The draft EIR/EIS' evaluation of impacts to downstream riverine habitats is inadequate. The EIR/EIS needs to address the sediment effects on the bed and water column. Under normal conditions sediment is transported over a six month period, generally the late fall through early spring period. Conversely, sluice gate releases, will travel in uniformly-sized sediment cluster that will move slowly downstream and overwhelm the riverine environment, depending on flow rate, flow duration, and channel morphology. The vast majority of the sediment released via the sluice gate method will be of uniform

size, so the particles would not redistribute themselves to any significant degree downstream. At a minimum, these impacts need to be analyzed in terms of steelhead spawning, rearing, and migratory habitat.

Response

The impacts from sluicing, for each alternative, are discussed in Section 4.4.3 of the Final EIR/EIS under Impact Issue FI-9a. Sluicing would occur in the same time period that sediment is naturally transported in the Carmel River (fall to spring).

Sediment does not move in a cluster as described by this comment and sediment would not accumulate at locations downstream of the Dam creating impediments to upstream movement. Downstream habitat would be altered by sediment moving past the dam with or without operation of the sluice gates once the dam is filled with sediment except for a remnant pool. Sluicing would result in a minor change in the timing of sediment transported past the dam. Sluicing would occur in advance of a storm event and would then be mobilized during the storm event. Sediment would fill interstitial spaces in the predominately cobble and boulder substrate of Reach 4 reducing habitat quality for invertebrates and juvenile steelhead.

Comment FI-80

In addition to the impacts to the lower Carmel River of sluicing downstream of the dam, NMFS is concerned about the impacts of the sluicing operations in the Carmel River arm and San Clemente arm of the reservoir. Issues such as the water quality associated with the rapid drawdown of the reservoir during sluicing, adult fallback rates, the loss of redds built in sediment mobilized during sluicing, and upstream adult passage from San Clemente Reservoir through unnaturally turbid water have not been adequately analyzed in this draft of the EIR/EIS. We believe sufficient analysis of the upstream impacts of sluicing to steelhead and their redds would reveal they are subjected to lethal or near-lethal conditions.

Response

Regarding water quality in the reservoir, please see response to Comment WQ-7. Regarding fallback, please see response to Comment FI-69. Substrate upstream from the proposed sluiceway and Dam is predominately sand and would not support steelhead redd construction or incubation. Please refer to the revised SOMP (Appendix J) and Section 4.4 of the Final EIR/EIS. Sluicing would only occur during the rising limb of a storm event and turbidity would be increasing along with the high flows. The reservoir would not be drawn down because there would be no reservoir, only a remnant pool. Water surface elevations would decrease as water ceases to spill over the Dam and begins to flow through the sluiceway.

Comment FI-81

For those steelhead that manage to survive, additional impacts from sluicing will occur and the EIR/EIS is silent on these impacts as well. For example, NMFS is concerned over delays to fish passage when the fish ladder is closed for days at a time (provided migrating adult steelhead are able to reach the ladder) in order to facilitate sluicing events. Sediment pulses below the dam, which according to available information will be lethal to 20 to 60 percent of the steelhead population, will force the remaining migrating steelhead to seek shelter to avoid the lethal levels of suspended sediment carried downstream, which will delay or prevent migration. Additionally, we believe adult migration passage will be adversely affected upstream of the dam during sluicing operations. Adult burst speed was considered in the EIR/EIS, but the distance of impaired passage upstream of the dam was not. The EIR/EIS did not consider whether adult steelhead can swim at full burst for 0.5 miles[4] (they cannot) or if they would even try to swim against water with exceptionally high suspended sediment concentrations. The large sediment plugs released several times a year by sluicing will also create passage barriers downstream in some low gradient sections of the Carmel River.

Response

The terms "sediment cluster plugs or pulses" are inconsistent with terminology associated with sediment transport mechanics. The amount of sediment that would be sluiced at any one time would be very small compared to the total amount of sediment moving in the river during a storm event. Sluicing would only change the timing of sediment moving past the dam, not the amount. Sluicing in and of itself would not generate enough sediment to create conditions that would prevent fish passage and sediment would not accumulate near the entrance to the fish ladder because following storm flows would mobilize the sediment from this section of the river. Please see the revised SOMP (Appendix J) for a discussion of sediment management. Operation of the sluiceway would not close the fish ladder for days at a time but for a matter of hours. The movement of sediment downstream of the dam and the modeled levels of suspended sediment were discussed in the responses to SED-42, FI-78 and FI-79 and apply to this comment as well. Presently, the closest upstream spawning sites are about 2,000 to 2,500 feet upstream of San Clemente Dam on both the Carmel River and Sam Clemente Creek and are well upstream of the effects of sluicing as envisioned in the SOMP.

Please see Appendices M and S. The distribution of high velocities upstream of the Dam modeled during sluicing in the MEI 2006 report were shown in Figures 25 and 26 (Appendix S, Part 1) representing sluicing at 300, and 500 cfs flows for 2, 4 and 8 hours.

Figure 25 (Appendix S, Part 1) (sluicing at 300cfs) shows modeled average channel velocities immediately upstream of the sluiceway at about 7.25 fps falling to between

[4] The upstream distance affected by sluicing

4.75 and 5.25 fps 100 feet upstream of the sluiceway. Over the next 400 feet, the average channel velocities range from 4.75 to 6.25 fps, then drop to between 4.5 and 5.25 fps for the next 300 to 400 feet upstream and then drop to between 4.5 to 2 fps for the next 2,000 feet upstream.

Modeled average channel velocities for a sluice event at 500 cfs show higher velocities at the Dam (up to 8.5 fps, and velocities in the 3 to 6 fps range for the remainder of the channel up to about 2,000 feet upstream). The highest velocities are associated with the moving nick point in the channel as the bed is scoured upstream of the sluiceway.

Swimming speeds for adult steelhead are from Bell (1986) as cited in Bjornn and Reiser (1991) and are shown below.

Cruising: 0 to 4.6 fps

Sustained: 4.6 to 15.7 fps

Burst: 15.7 to 26.5 fps

Cruising speed is defined as a speed the fish can maintain for an extended period of time, Sustained speed can be maintained for a period of several minutes. Burst speeds can be maintained for a few seconds. Adult steelhead cruising and sustained speeds indicate that fish would be able to pass upstream even during sluice gate operation. Burst speeds would be sufficient to escape the high velocities near the sluice gate. Based upon the distribution of modeled average velocities, adult steelhead should have no difficulty in successfully moving upstream even when the sluice gate is open. Velocities would be much less when the sluice gate was closed and the flows are moving over the spillway.

With the new fish ladder and the sediment management options, steelhead conditions will improve over the existing condition.

Comment FI-82

Page 4, first paragraph of Fish Behavior and Movement section: The operations protocol for cutoff of flows to the ladder is set at 20 or more fish passing the ladder during the previous 2 days to protect steelhead. This cutoff protocol is completely inadequate because the number of steelhead used equates to over 6 percent of the recorded adult population passing SCD in recent years.

Response

Please see the revised SOMP (Appendix J) and responses to Comments FI-50, FI-57f and FI-57g. The protocols do not call for cutting off flows to the ladder, only that a gate, that could still pass flows to the ladder, would be closed at the top of the ladder to prevent fish from swimming out into the sluicing event and be subject to fallback. The

protocol was established to avoid impacts to large groups of steelhead that might be migrating upstream.

We have eliminated this standard of 20 fish from the revised SOMP in the Final EIR/EIS. The standard was developed based on an analysis of daily ladder counts at SCD from 1993 to 2004. The fish passage data indicate that when daily steelhead counts reached at least 20 fish, a series of days followed where counts were equal or higher. The objective of this standard was to avoid sluicing when potentially large numbers of adults were in the river downstream of SCD. Please refer to the revised SOMP (Appendix J).

Comment FI-83

Page 4, last paragraph: NMFS does not believe that the plan to induce upstream migration from a resting area would work. Instead, the steelhead may just move to a different location a few feet away.

Response

Thank you for your comment. Comment noted. The movement of steelhead away form the sluice gate is exactly the type of movement we would hope to induce. As the sluice gate is opened, this movement pattern would continue in an upstream direction putting distance between the steelhead and the sluice gate. We would avoid rapidly opening the sluice gate to allow fish to continue to move upstream away from the high velocity water.

Comment FI-84

Page 7, second paragraph: There will be mortality and the survivors will have their migration delayed due to steelhead response to the sediment plume as it passes the length of the river from the dam to the ocean. This avoidance behavior to extreme sediment loads is well documented.

Response

Please refer to the response to Comment FI-78 and FI-79. Suspended sediment would not move in plume that passes the length of the river. The carrying capacity of the river would determine the sediment load downstream of the dam. Sediment that is sluiced and not carried by the river would remain in the plunge pool until flows increase to the point where it can be mobilized.

Comment FI-85

In table 4.4-2, you cannot express fish counted as a percentage of the total run of fish if the total number of fish in the run is unknown. Available information indicates that during some years, fish pass the counter on the ladder on the last day the counter is operated; strongly suggesting the adult migration was not complete. Obviously, "most" of the run has passed in this time period, but using percentages is inaccurate. There are some

years that the river flows to the ocean year round and adults can move upstream at any time, and early and late migrations are known for the few years the counter was in use early or late in the year.

Response

NMFS also consistently uses unqualified percentages to make estimates of the size of remaining listed populations even though the actual historic and current numbers of the runs are unknown or guessed at. Because the information presented in the table is qualified in Section 4.4 of the Final EIR/EIS it is appropriate to express it as percentages. Early and late migrations are known from some years, but even these late movements have time limits. As an example, Shapavolov and Taft (1954) operated a trap year round on Waddell Creek, within a mile of the ocean. Upstream adults were taken from late October to July over the ten-year study but never did this range of movement occur in the same year. When fish moved early, such as in late October, the last migrant was taken in late April. In years when fish were collected in late June or July, the migration didn't start until late December. In all cases the early and late migrating individuals were solitary fish and later running fish were typically females. The point is that what is presented as the migration percentages are well-founded estimates of the core of the run.

It is acknowledged that the fish that move outside of the mid-December to May 31 time frame make up a small percentage of the total but could retain some behavioral traits important to the population in an evolutionary context.

Comment FI-86

Table 4.4-5: Again, percentages cannot be used in this case because only 60 percent of the habitats are considered. We know the lagoon provides rearing habitat and there are some areas of good quality habitat in reach 3 as well. The percentages given in the table are inflated by not including the other 4 reaches that were not analyzed.

Response

Please refer to comment to FI-85. The Table 4.4-5 is referenced to Dettman (1990) and is a basic piece of background information presented here to provide an overview of the spawning habitat distribution in the Carmel River. This table refers to spawning habitat, not rearing habitat, so it does not address the lagoon at all.

Comment FI-87

Sleepy Hollow Steelhead Rearing Facility section: The entire section can be eliminated as it adds nothing to the discussion of the SCD EIR/EIS. The rearing facility was established to raise fish that are displaced when the river downstream dries up every year.

Response

Comments were received during agency review of the Administrative Draft EIR/EIS that specifically requested this section be included in the EIR/EIS. The section needs to be in the document to set the stage for project impacts that affect the rearing facility.

Comment FI-88

Table 4.4-6: Under PP, Reach 4 – 8,532 and 8,522 – are these supposed to be the same? Please explain the difference in numbers for reach 6a between alternatives. Under reach 5, Alt 1, why do the operations have half the effects of CY2 and 3? We recommend describing the difference between CY and operations below the chart.

Response

The discrepancy between the operations take estimates for reach 4 between projects is a typographical error. The correct number is 8,522. Thank you for calling it to our attention.

There is no difference in the numbers for Reach 6a between the alternatives. For Reach 6a, the analysis indicates there would be no effect from construction, but sediment and turbidity would be transported into Reach 6a under the project operations for all the alternatives and the No Project Alternative.

For Reach 5, operations have a much greater effect than construction because sediment and turbidity from the reconstructed channel and the bare floodplain in the former reservoir inundation zone would be carried downstream affecting Reaches 4, 5 and 6.

Comment FI-89

FI-1, Access Route Improvements: NMFS disagrees with the effects determination of "temporary" for this aspect of the project. The EIR/EIS indicates the roads will be permanent, some becoming the primary access routes after the project. Riparian roads are a leading cause of water quality degradation, contributing fine sediments and leading to increased cobble embeddedness. The bridge over Tularcitos is a major impact associated with this project, which is not reflected in the effects determination.

Response

With the exception of Tularcitos Creek, all other roads are existing and runoff from them is an existing condition. The impacts are considered short-term during construction. Construction of the bridge over Tularcitos Creek would be staged to avoid impacts to the creek. Access to both abutments can occur from either end of the bridge. Construction of the bridge would occur outside of the active channel. Approximately 100 feet of channel would be temporarily dewatered during the construction season (CY1) and any fish found in the section would be rescued and relocated. Upstream flow would be directed through a pipe that would run through the construction area. The short

length of channel is affected only temporarily during construction year 1, mitigation is offered and no ongoing impacts are anticipated, therefore it is not considered to be a significant impact.

Comment FI-90

FI-3, Operation of a Trap and Truck Facility: This has been avoided by the June 15-Oct 15 instream work window for PP and Alt 1 – no trap and truck measures will be needed. For Alt 2 and Alt 3, NMFS is still willing to eliminate the trap and truck expense to get the dam removed.

Response

Thank you for your comment. The Trap and Truck measures have been deleted from the Final EIR/EIS (see discussion on Impact Issue FI-3). Fish rescue and relocation measures will still be required for the various dewatering activities (Impact Issues FI-2, FI-4 and FI-5).

Comment FI-91

FI-6, Water Quality Effects on Fish: Include language on fuel storage, spills, BMPs, etc. Also, for some reason, impacts to water quality resulting from the sluice gate have not been analyzed. NMFS expects the impacts to steelhead from sluice gate operations will be lethal the entire 18.5 miles below the dam.

Response

Impacts to water quality from construction activities are addressed in Section 4.3 of the Final EIR/EIS. See Impact Issue WQ-13 for impacts of Sluice Gates. Impacts to water quality from sluicing on fish are provided in the Fisheries Section 4.4.4 under Impact Issue FI-6 for each alternative. Impacts considered include increased turbidity and suspended sediment loads. Please see the response to comments for FI-78. The sediment transport capacity of the river would determine how much of the channel would be affected by sluicing operations. The time slot for sluicing would be short (hours) and would occur on the rising limb of a storm hydrograph. Increased levels of turbidity from sluicing would be expected to occur in the Carmel River down through Reach 5 and possibly into Reach 6 before the levels would be undetectable from the following storm flows. Increased levels of suspended sediment from sluicing would be expected to occur throughout Reach 4 and possibly into Reach 5. Some of the sediment released by the sluicing operation would be locally deposited in the plunge pool area and along the channel downstream. As streamflows increase following the sluicing event, these sediments would be re-mobilized and moved downstream similar to what occurs under a typical storm flow event.

Comment FI-92

FI-7, Fish Ladder Closure: Long-term ladder issues, specifically those causing closure , need to be addressed – sediment inundation, sluicing operations, etc – in the EIR/EIS

as well as in the O and M Plan with acceptable passage plans when the ladder is impassable.

Response

Please refer to the revised SOMP (Appendix J). This plan would be implemented as an adaptive management plan that would be conducted in consultation with NMFS and other appropriate agencies. The ladder would not become impassable; it is designed to facilitate sediment passage, however, a section of the channel upstream of the ladder may become impassable. If sluicing or dredging does not successfully restore fish passage, upstream migrants would be captured from the ladder and transported past the obstruction and released into the river.

Comment FI-93

FI-8, Upstream Fish Passage: Please refer to General Comments on sluice gate operation and then address the inappropriate effects determination. As for passage between the reservoir and upstream habitat during sluicing, would 300-700 cfs, 1-foot deep, and the width of the channel for 0.05 miles be a passage barrier? The river was considered passable by citing steelhead burst speeds in feet per second (fps) and flow rates of about 6 fps 50 feet upstream of the dam. At this time however, 2-4 acre feet of sediment will be flowing down the Carmel at 6 fps. Steelhead don't usually swim into areas of high suspended sediment, but rather try to find cover, hold along the channel bottom, and delay their migration until there is less suspended sediment in the water. It is more likely that they swim downstream away from the sediment laden water rather than upstream through it.

Response

Please refer to the revised SOMP (Appendix J) and Impact Issues FI-8 and FI-9a in Section 4.4.3 of the Final EIR/EIS for an improved explanation of the effects of the sluicing. Steelhead do not hold along the channel bottom during large flow events because that would expose them to saltating bedload and the highest concentration of suspended sediment in the river channel. Fish hold near the sides of the channel or near banks in low velocity water during floods.

Comment FI-94

FI-9, Downstream Sediment Impacts: Please refer to General Comments and then address the inappropriate effects determination. The sluiced sediment will not be "mobilized and redistributed" but will more likely be uniformly-sized material and will move through the river in what is described as a "plug flow." It will be mobilized, but it will move downstream, smothering each area that it moves into until it reaches the ocean. In low gradient channels, this process can take decades even if flows are above normal every year. The impacts will easily range from the dam to the ocean and will exceed lethal limits the entire way downstream. In regards to the number of fish impacted, only the numbers of rearing fish are considered, but migrating adults,

migrating smolts, and rearing juveniles will be subjected to lethal levels of suspended sediments in the lower river. Essentially 100 percent of the anadromous fish in the Carmel River will be affected by this project if it is carried out as described in the Mussetter Report, which notes the need to sluice every 5 to 20 days during the migratory season.

Response

Effects are not anticipated to be observable the entire distance of the Carmel River from the dam to the ocean. Lethal levels of suspended sediment would not occur and are additionally discussed in responses to comments FI-78 and FI-79, above. Please refer to the revised SOMP (Appendix J) and Appendices M and S for a better understanding of sediment transport and to the modeling studies conducted by MEI (MEI 2007b, MEI 2006) to assess the impacts of dam removal with sediment release.

Comment FI-95

FI-13, Stream Sediment Removal: Must remove sediment to access the lower gate in the dam face. Where will the sediment be disposed of, how will you remove it, risk of fuel spills/lubrication leaks, fine sediment against dam, et cetera.

Response

Section 4.4 of the Draft EIR/EIS discusses sediment storage upstream of the Dam Impact Issue FI-13. This discussion is also contained under Impact Issue FI-13 for Alternative 3 in the Final EIR/EIS. Effects on to water quality related to construction activities are discussed in Impact Issues WQ-2 and WQ-14 in Section 4.3 of the Final EIR/EIS.

Comment FI-96

FI-14, Notching Old Carmel River Dam: NMFS understood the original plan to notch the Old Carmel River Dam would require dewatering the area around the dam. Mortality of steelhead in dewatered areas is likely to occur and would be a significant impact under NEPA. The effects determination here is incorrect.

Response

Section 4.4.3 of the Final EIR/EIS discusses the impacts and mitigations related to Impact Issue FI-14 Notching Old Carmel River Dam, Short term loss of rearing habitat, Improvement of fish passage and addresses the dewatering and rescue procedures discussed on page 4-141 of the Draft EIR/EIS. The fish would be rescued and relocated to suitable habitat.

Comment FI-97

Alternative 2, FI-9, Downstream Sediment Transport: This will be beneficial as natural sediment loads would be transported during natural sediment transport flows. Natural sediment transport would be allowed to occur during all flows during all times of the

year, differentiating this alternative and Alternative 3 from the previous two alternatives that would not provide natural sediment transport, but rather pulses of sediment at levels that would be considered catastrophic if they occurred naturally.

Response

Alternatives 2 and 3 would also transport substantial amounts of fine grained sediment to downstream reaches once the dam is removed and there would be substantial amounts of fine sand remaining in the former inundation zone. Since the area could not be revegetated until the Dam is completely removed, bare soil would be exposed and would be susceptible to erosion for the first few seasons. While there would be a more immediate restoration of sediment transport through the former reservoir inundation zone compared to the Proponent's Proposed Project, Alternative 1, or the No Project Alternative (Alternative 4), it may take a few years before sediment reached the Dam site and moved into the channel downstream. Analysis of Alternatives 2 and 3 indicates that there would be short-term sediment impacts downstream of the Dam site with long-term benefits once the area is sufficiently revegetated and sediment transport is restored in the channel.

Comment FI-98

In Alternative 4, sluicing seems to be part of this alternative, but it is not addressed in the same fashion as the Proponent's Preferred Project or Alternative 1. It should be addressed in the same fashion and the effects determination should be the same for both. There are several instances where the effects between the No Action Alternative and the Proponent's Preferred Project are the same in their description, but different under the effects determination. **(Also SED-56)**

Response

In order to maintain consistency with the CEQA and NEPA Guidelines and the September, 2005 Notice of Preparation filed by the Department of Water Resources, the fish ladder and sediment management are no longer considered part of the No Project alternative. The Final EIR/EIS has been changed to clarify this.

July 3, 2006 letter from Robert W. Floerke / Department of Fish and Game

Comment FI-99

[C]DFG sees Dam strengthening as inherently problematic in terms of overall risk to riverine resources. The DEIRIEIS does an adequate job in providing documentation of passage at the Dam for the last several decades, but does not provide enough historical context for what is now a tenuous condition of steelhead within the watershed. While it is true that steelhead observed in an evolving series of ladder counts have shown numbers as high as 1,400 between 1962 and the mid-seventies (and as low as 15 in 1992), the key management context for the population overall is that it is currently below 5 percent of known historic estimates. As such, its numbers are low enough to be at risk

of local extinction. Any actions CDFG takes in this setting, such as voicing its opinion in the public comment process, or developing resource protection measures through the SAA process, must consider these parameters. The [C]DFG position is that making the dam to a permanent fixture in the watershed for the foreseeable future is to exacerbate local extinction risk. While the proposed improvements to the fish ladder, viewed in isolation from the prospects of the Carmel River population, should improve passage success, they cannot compare with the positive effects of replacing the ladder with natural passage. Even the best functioning ladders will impede passage, at rates currently documented between 5 percent and 40 percent for anadromous fish. Fallback and delay, effects on reproductive success due to increased stress, hesitation at entrance pools and kelt mortality are among the known factors associated with ladders that can only reduce overall recruitment to the population.

Response

Comment noted. The purpose and need of the proposed action which the Final EIR/EIS evaluates is to provide dam safety, not to improve fish passage or recover populations of fish. The presence of SCD on the river is an existing condition; it is not an impact of the project.

Comment FI-100

Squarely outside of the baseline is the impact of the new proposed sluicing regimen that will be necessary in perpetuity to periodically move significant tonnages of accumulated sediment from behind the dam into the incised river corridor below it. Due to time and staffing constraints, [C]DFG can not comment extensively on the specific details of its concerns on the Draft Plan prepared to date (Appendix J). We have instead coordinated with the National Marine Fisheries Service (NMFS) in recent months and concur with the analyses presented in their comment letter on this specific issue. The most important and basic aspect of the sluicing regimen is that it will be, along with the ladder, at the very minimum be a chronic stressor on the steelhead population. Furthermore, passage through the reservoir is likely to be poorer (higher water temperature, decreased cover, increased predation) in perpetuity with the sluicing regimen than it was in a deeper reservoir just a few years ago (and certainly inferior to a re-naturalized river reach).

Response

Please refer to the revised SOMP (Appendix J). A great deal of the area upstream of the Dam was barren of vegetation in 1997, the first year the reservoir was operated without the stop logs. Based upon the rapid development of a defined and vegetated channel upstream of the Dam in the Carmel River we expect similar conditions to develop all along the river up to very near the Dam. This would greatly improve passage conditions and would also avoid the temperature, predation and habitat issues that are implied to persist in the reservoir for the long-term.

Comment FI-101

As presented in Appendix J, sluicing operations are untested and lack specificity. They are based on migration records and behavioral observations of an already residual run and do not attempt to model the population recovery that the resource agencies believe should be a primary objective of the project. They do offer an interesting projection based on admittedly the most accessible, rather than effective, data collection methods (e.g. the use of the Robles Del Rio gage 5 miles downstream of the dam rather than the Sleepy Hollow gage). While the plan strives to identify permutations that would minimize the concurrence of sluicing and migration, the complexity of variables appropriately identified in the "Proposed Sluicing Decision Tree" (Figure 3) belies the inherent difficulty in juxtaposing the need to remove sediment from the reservoir and improve fish passage. The draft plan appears to fail to consider in detail predictable outliers to watershed conditions experienced from 1994-2005, such as fire, drought or prolonged heavier flows, which would alter debris loading, sediment particle-size distributions and vegetative encroachment in the reservoir. The adaptive management aspect of the plan appears to be traditional dredging that would occur at the upstream end of the fish ladder "on average every three years." If heavy storms and high flows are prevalent, this dredging would be precluded, making historically productive wet years the most impacted.

The experience of the last two decades with maintenance issues at the fish ladder amply illustrate the difficulties in achieving resource management priorities particularly during storm events. We are confident that CAW will do their best to comply with all aspects of the Sluicing Operations and Maintenance Plan that is still to be developed, but are concerned that the full implications of the plan be fully understood so must be evaluated as an unknown. By design, sluicing will need to happen more or less concurrently with the adult migration of steelhead in the Carmel River. The document correctly identifies the impacts of the sluicing to fisheries and water quality as significant and unavoidable (Table 2.1, Impacts FI-9 and WQ-14).

Response

Please refer to the revised SOMP (Appendix J). The purpose and need of the proposed action which this Final EIR/EIS evaluates is to provide dam safety, not to improve fish passage or recover populations of fish. The presence of SCD and its effects on the river is an existing condition; it is not an impact of the project.

While this may be considered a “residual” run, the information on migration timing and magnitude is very applicable. A restored run would migrate upstream, spawn and outmigrate during the same time frame because the access to the river and tributaries is provided by winter stormflows. The histograms provided in Figures 4.4-5 are similar to the run timing and magnitude to the histograms in Shapvolav and Taft on Waddell Creek from steelhead studies conducted between 1932 and 1942 on what was then a healthy run of steelhead. Waddell Creek is in the Central California Coastal ESU and

migration occurs slightly earlier than the South-Central California Coastal ESU and the Carmel River in general.

Realtime data was obtained from the USGS for use in the sluicing analyses. The Sleepy Hollow gage is maintained by the MPWMD for the purpose of measuring low summer flows and is not rated above flows of about 300 cfs.

The Carmel River is very dynamic in nature and the ongoing evolution of channel development in the inundation zone of San Clemente Reservoir is a testament to the dynamics. The fact that a channel has been formed and vegetated in the last 10 years is a positive factor for the future of the river. We expect that the channel would develop and stabilize in the near future immediately upstream from the Dam, and that this would be a very useful feature supporting fish passage upstream of the fish ladder **(Also SED-57)**.

NOTE: COMMENTS COMMENT FI-102 TO COMMENT FI-110 CORRESPOND TO PUBLIC HEARING TESTIMONY COMMENTS

Comment FI-102

Jonas Minton/Planning and Conservation League Environmental Advocacy Organization

We think that additional attention needs to be placed on the difficulties of sluicing from either the dam strengthening alternative or the notching alternative. How do you sluice at the same time you maintain fish passage? The time that you want to sluice is when the fish want to out-migrate.

Response

Please refer to the revised SOMP (Appendix J) for an explanation of sluicing operations. Sluicing does not present an impairment threat for downstream migrating juveniles. During sluicing access from the ladder would be closed to prevent upstream migrating fish from exiting the ladder and being exposed to potential fallback through the open sluiceway. However, downstream migration can occur either through the ladder, over the Dam or through the sluice way. Sluicing does not impair the ability of fish to move downstream past the Dam. Downstream migrating steelhead would be exposed to short-term, locally higher suspended sediment loads and turbidity in the river downstream of SCD.

Comment FI-103

Hank Smith/Resident of Monterey

Lastly, but most importantly, alternatives other than dam removal will have a negative impact on the fish. And the ladder is not only ineffective, but even the best fish ladders -- and not many people are aware of this, but even the best fish ladders only allow 50 to

80 percent of the fish to migrate upstream. So even if we upgrade this fish ladder, we're still not really doing justice to the fish. Upgrading and ongoing care and maintenance of the fish ladder in these other alternatives will be very significant and will be borne by you and me for decades to come.

Response

Thank you for your comment. Comment Noted.

Comment FI-104

Hank Smith/Resident of Monterey

The notching alternative bothers me because it was not clear how the fish are going to out migrate. You know, these fish are returned back, if they can. They return back to the sea and they do this several times. But the notching doesn't describe how they are going to make that journey. And we already have experienced situations on the existing dams where the water flow is such that these fish trying to make their out migration; that is, to return back to the ocean are destroyed.

Response

The fish would migrate downstream in the same way as they do currently. However, with the notching the distance into the plunge pool would be about 20 feet less than under existing conditions. The new fish ladder would be designed to carry all the flow in the river up to about 55 cfs, and a portion of the flow thereafter. The existing fish ladder can only carry about 10 cfs.

Comment FI-105

Dave Zach's/Resident of Carmel Valley

Regarding the fish, the more care and attention we give to this fish run. I think the better. However, there was a healthy fish run here 50, 60 years ago in spite of the dam. So whether we really need to demolish the dam in order to improve the fish runs, I do not know.

Response

Thank you for your comment. Comment noted.

Comment FI-106

Roy Thomas/Carmel River Steelhead Association:

Never has anybody built a fish ladder to a reservoir full of sediment and not had nothing but trouble trying to keep the fish ladder functioning.

Response

Comment noted. The existing reservoir full of sediment and the existing fish ladder are existing conditions. They are not impacts of the project. The new ladder would be an improvement over the existing conditions.

Comment FI-107

Roy Thomas/Carmel River Steelhead Association

The threatened and possibly soon-to-be-endangered steelhead that live in the Carmel River, because their population has been dropping in the last seven years, they have lived in the Carmel River for tens if not hundreds of thousands of years.

Response

Thank you for your comment. Comment noted.

Comment FI-108

Nikki Need/Resident of Carmel Valley

Removing the sediment from the San Clement side and placing it on the Carmel side still has some issues in my mind. Most importantly, will that habitat which will be lost, the wonderful riparian habitat, habitat for red-legged frog and juvenile steelhead, will that habitat be replaced by upland habitat with the addition of more sediment? So that's the first comment.

Response

The habitat along the existing Carmel River from the Dam up to about 3,800 feet upstream of the Dam would be converted to a mixture of upland and wetland habitat. Sediment from the San Clemente arm would be removed and stored in the part of the Carmel River arm that would be cut off from the river. There are opportunities to create wetland and pond habitats that would support California red-legged frogs in this area but it would no longer be a riparian system along the Carmel River and it would not support steelhead. The river would flow through the San Clemente arm. The habitat existing in the Carmel River upstream of the Dam beyond the 3,800 feet distance would remain in tact.

Comment FI-109

Keith Andover/Resident of Carmel Valley

Right now downstream of the San Clemente Dam there are essentially – well, since the draining of Garzas Creek there are essentially no tributaries that are suitable for juvenile steelhead to oversummer, whereas upstream of the San Clemente Dam between the San Clemente Dam and the next obstruction, which is the Los Padres Dam, there are several very high-quality, you know, higher-elevation tributaries that do provide significant oversummering opportunities for juvenile steelhead. So that there's a real –

you know, getting fish back and forth past this current obstruction, there's a lot of reason to believe it would be of enormous benefit to the steelhead. And as we all know fish ladders, you know, don't do the job.

Response

Comment noted. The reservoir and the fish ladder are existing conditions. They are not impacts of the project, although the new ladder would be an improvement over the existing conditions.

Comment FI-110

Jim Lambert/Carmel River Steelhead Association

I couldn't tell, on the map that you showed up there of the bypass route, will that provide unobstructed routes for steelhead passage without having any small ladders or anything? Is that going to be bulldozed through to some degree? Or will there be tall cliffs and falling? I have no idea what that looks like, because I didn't see a topographical map

Response

The concept is that fish passage would be provided through the San Clemente Creek arm without the use of ladders or other fish passage structures. Please refer to Chapter 3.5 for a description of the Alternative 3, including a topographic map.

June 29, 2006 letter from Duane James/U.S. Environmental Protection Agency

Comment FI-111

All project alternatives may have short-term impacts to California red-legged frog habitat and water quality due to sedimentation or sediment deposition. However, we note that selecting an alternative that incorporates dam removal (such as Alternative 2 or 3) would meet the project purpose and need, restore the natural basin hydrology, and provide long-term benefits to the threatened steelhead population in the Camel River by improving fish passage and the stream gravel replenishment necessary for spawning. The document notes that passage in a free-flowing stream is preferable to a fish ladder (p. 5-22). It also documents a concern that the steelhead population is threatened by-the development of water resources, drought, and watershed, land use, and environmental problems (p. 4-103). However, the analysis in the DEIS does not fully describe the environmental benefits (both in the River and the steelhead population) that may result from removal of the dam.

Response

Benefits of dam removal are presented in Table 2.1 and discussed under Impacts FI-7, FI-9a, FI-9b, , and FI-13 for Alternatives 2 and 3. The project does not alter flows, it only

retains, notches or removes a dam that retains a former reservoir now nearly completely full of sediment.

Comment FI-112

In addition, we note that the decision to stabilize the sediment in place (as proposed in Alternative 3) would reduce habitat impacts to special status species in the area, as disposing of large volumes of sediment at the proposed sediment disposal site could destroy habitat and may also injure or kill special-status wildlife species (p. 4-209). Alternative 3 (Carmel River Reroute and Dam Removal) is expected to take the same amount of time to complete as the Proposed Project (Dam Strengthening), but unlike the Proposed Project, it would not have unmitigatable, significant turbidity impacts to the Camel River from sluicing (p. 2-37 and 5-2).

Recommendations: In order to fully weigh the costs and benefits of each proposed alternative, the FEIS should include a detailed analysis of the projected effects of the removal of the dam on the River and the steelhead population. This information should be used in the determination of the LEDPA.

Response

The impacts and benefits of the alternatives are discussed in presented in Table 2.1 and discussed in Section 4.4.3 of the Final EIR/EIS under Impact Issues FI-7, FI-9a, FI-9b, and FI-13 for all the alternatives and the Proponent's Proposed Project. The differences in long-term impacts to the river are relatively minor, since sediment will begin to pass over the Dam within six to ten years. Coarser sediment would be transported downstream more quickly under Alternatives 2 and 3 compared to the Proponent's Proposed Project and Alternative 1.The impact to the river could be greater in the short-term for the Alternatives compared to the Proponent's Proposed Project since the river has been starved of sediment downstream of SCD for about 80 years. Restoring the full 16.5 AF of average annual sediment transport past the dam site under the removal and notching alternatives could impair the river more in the initial years after dam removal compared to the Proponent's Proposed Project.

Long term benefits to spawning and rearing habitat would occur to primarily in Reach 4 downstream of the Dam. New channels would develop upstream of the Dam but it's not possible to say whether that habitat would be better or worse than under existing channel conditions. However, it is likely that conditions would be better and that there would be more available channel than currently occurs upstream of the Dam since some of the poorer reaches of channel near the Dam would be replaced with better quality channel. Some of the better reaches of channel in the upstream reaches would be replaced with similar quality habitat. Comparison of channel gains and losses is presented in the Final EIR/EIS in Table 4.4-11.

The major benefit for the steelhead population would be the removal of the fish passage barrier at San Clemente Dam. This would provide steelhead movement into the upper

watershed with essentially unimpaired access past the dam site and could increase migration and spawning success of adults passing the dam, or increase the number of fish passing the Dam. The ability to count the number of fish passing San Clemente Dam however would be lost so documenting impacts of the project or the recovery of the population would become difficult.

Carmel River Steelhead Association Comments on San Clemente Environmental Impact Report

Comment FI-113

It is obvious from review of the EIR that a 10 ft. diameter sluice gate operated as described in the operational plan will not protect threatened steelhead from "take" (death of a critical part of the population hindering recovery and leading to further decline toward extinction).

The 10 ft. gate is too small to have the desired sediment management effect and allow safe passage. It has a narrow window of effectiveness. It would not operate well at flows above 600 cfs because of backwater effects. Timing of operation is critical and costs of keeping a gate operator and a fish ladder operator present doesn't seem realistic knowing how dams have been operated in this state. Many times the debris and sediment flows will clog and jam this small sluice gate as well as the fish ladder. The expense and disruption of shutting down and shoveling out the 60 plus bays of the fish ladder multiple times during wet years, has not been evaluated.

The fact that steelhead frequently restart their migration on the rising limb of the hydrograph makes any operation of a sluice gate likely to wash back and probably kill migrating Steelhead resting in the reservoir or pooling below the dam. A "take" (the death of a critical part of the population hindering recovery and leading to further decline toward extinction) of threatened species would be expected.

I have contacted fish passage experts in Alaska, Washington, Oregon and California and could find no one who knew of a fish ladder functioning successfully on a reservoir that is 90 percent full of sediment. Even light sediment will tend to settle in the calm resting areas designed into a fish ladder, disrupting or blocking passage.

Response

The fish ladder is designed to facilitate passage of sediment. The 10-foot sluice gate is located and designed based on an analysis of sediment transport at the fish ladder entrance. Fish fallback has been identified as a potential issue with operation of a sluice gate (please see response to Comment FI-69). Minimization of the effects have been incorporated as part of the mitigation plan.

Comment FI-114

Any new diversion point, or old one for that matter, needs to have a properly sized, durable and functioning fish screen.

Response

As indicated under Impact FI-11, any relocated surface water diversion would have a CDFG and NMFS compliant fish screen installed.

Comment FI-115

It is very important to understand that there are no areas of the Carmel River or its tributaries below San Clemente Dam that have spawning habitat and perennial flow. This means that if San Clemente fish ladder does not function, the offspring of steelhead forced to spawn on the suitable habitat will be dried up and lost. To put it simply a failed retrofit will cause the extinction of steelhead on the Camel River.

Response

Thank you for your comment. Comment noted. The fish ladder is expected to function as designed.

June 28, 2006 letter from Bob Baiocchi/Carmel River Steelhead Association

Comment FI-116

San Clemente Dam has a fish ladder. However, the draft EIR/EIS did not include data and information that the fish ladder allows for steelhead trout species to effectively use the fish ladder and migrate upstream safety at all times when the reservoir is choked with sediment.

Discovery work conducted by the Carmel River Steelhead Association shows that fish ladder on reservoirs that are filled with sediment do not work effectively because the fish ladder becomes choked with sediment and becomes non-operational for fish passage.

The draft EIR/EIS must include data and information that shows the fish ladder was effectively working and allowed all steelhead trout species to migrate safety upstream to spawning and rearing habitat in the upper Carmel River. Consequently, there must be evidence in the draft EIR/EIS that provides proof to the public that the fish ladder provided passage at all times and allowed for safe passage of all federal protected steelhead trout to the upper river when the reservoir is filled with sediment.

Response

Data from the existing fish ladder is presented in Figure 4.4-4 and discussed in the accompany text. No efficiency studies have ever been conducted on the existing ladder. Ladder counts have been made at SCD and in the ladders at LPD, but there is no information on how many fish that approach the ladders and of those how many enter the ladder. There is no information on how many fish that enter the ladders complete their ascent. There is no information on how many fish fallback over the Dam after ascending the ladder. The new ladder would be designed to pass sediment. The presence and effects of the existing dam and fish ladder are part of the baseline

environmental condition. The proposed new fish ladder would be an improvement over existing conditions.

Comment FI-117

Case law provides for monitoring under CEQA. The draft EIR/EIS must include a Steelhead Ladder Monitoring Plan for the fish ladder during the post project period for the life of the project so that the public can be assured the fish ladder is working at all times and that the fish ladder is allowing safe passage for steelhead to migrate upstream above the dam. However, if the most reasonable alternative was selected and the dam was removed, the defective fish ladder would not be necessary.

Response

A monitoring plan would be developed for the selected alternative as part of permitting.

Comment FI-118

It is well known that dams prevent the downstream recruitment of spawning gravels for downstream spawning of resident and anadromous fisheries. In this case the San Clemente Dam is preventing the downstream recruitment of spawning gravel in a significant large portion of the streambed of the Carmel River that has adverse impacts to spawning habitat of federally protected steelhead trout species in the lower Carmel River.

Response

This is an existing condition. It is not an impact of the project. The Dam has been holding back sediment for over 80 years and is nearly full of sediment. For the entire Proponent's Proposed Project, Alternative 1, and the No Project Alternative, sediment would soon begin moving over the Dam as the reservoir is filled **(Also SED-69)**.

Comment FI-119

The draft EIR/EIS must include a Steelhead Trout Gravel Recruitment Plan for the lower Carmel River below San Clemente Dam in the event the removal of the dam is not ordered by any regulatory state and federal agency.

Response

The effect of the existing dam on sediment delivery to the downstream reaches is part of the baseline environmental condition. It is not an impact of the project. The Dam is nearly full of sediment and would soon be passing sediment downstream. For that reason, all alternatives, the Proponent's Proposed Project and the No Project Alternative would result in sediment being transported past the Dam in the very near future. Please refer to response to Comment FI-115 **(Also SED-70).**

Comment FI-120

The San Clemente Dam obstructs the navigable waters of the Carmel River for fish and public boating. Clearly Cal-American has a public duty to protect federally listed steelhead trout in the Carmel River from it's water diversions from the Carmel River Watershed. Consequently it would be reasonable, in the public interest, and in the best interest of the federally protected Steelhead Trout to require Cal-American Water Company to prepare a Carmel River Steelhead Plan that would significantly improve the steelhead resources in the Camel River Watershed to the Pacific Ocean, including the Camel River Lagoon. Said Management Plan must be included in the final EIR/EIS.

Response

The effects of the existing dam on fish and kayaking passage are part of the baseline environmental condition. They are not impacts of the project. The purpose and need of the action which this Final EIR/EIS evaluates is to provide dam safety, not to improve steelhead resources or kayaking.

June 30, 2006 letter from Mindy McIntyre/Planning and Conservation League Foundation

Comment FI-121

The technical design for "sluice gates" required for both the Proponents Proposed Project (PPP) and Alternative 1, is inherently flawed for several reasons. First, relying on the sluice gates as the primary method of sediment management will lead to significant unintended consequences caused by ongoing release of the sediments to prevent future build-up of sediment above the dam structure. The continuous release of sediment will result in impacts to water quality, will continue to cause degradation of habitat downstream of the dam site, and will assure that present trends in scouring just below the dam structure will also continue to occur.

Response

Please refer to the revised SOMP (Appendix J). Sluicing is one method used to manage sediment build-up. A second tool is dredging. If access from the ladder is blocked, fish can be captured in the ladder and moved upstream of the impaired passage. Habitat downstream of the Dam is degraded from lack of sediment transport past the Dam. The sluicing operations would not be continuous but intermittent. Sluicing would move sediment staged to be mobilized from upstream of the Dam to downstream during storm flows **(Also SED-71)**.

Comment FI-122

Both the PPP and Alternative 1 also require a fish ladder to allow fish passage above the dam structure that we believe will also threaten the survival of migrating steelhead unable to navigate safely through the area directly above the sluice gate, causing fish to become caught up in the downstream flow, and back downstream through the sluice gate.

Response

The sluice gate has been positioned to maximize sediment removal from upstream of the ladder and minimize the risk of fish to fallback through the sluice way when it is opened. Access from the ladder into the upstream channel would be prevented prior to and during sluicing events.

Comment FI-123

The dam structure currently impedes the current survival of the steelhead trout. Even with a new fish ladder design, the "sluice gate" design poses a threat to fish passage that will require monitoring and modification, and perhaps lead to mitigation for ongoing impacts to steelhead. It is a stated goal for the steelhead resource to be maintained "as a self-sustaining resource and to restore it as much as possible to its historic level of productivity" (4-103). Only the removal of the dam will ensure that. The DEIR/S also notes that "the steelhead population in the Carmel River is threatened with becoming a remnant run due to the development of water resources, drought, watershed land use, and environmental problems" (4-103). Removing the dam will go a long way to preserving this endangered species. Dam removal and river reroute will restore natural sediment transport levels that can improve important spawning and feeding habitat conditions in the mainstream, and will also assure that migrating species can make their way to important spawning areas above the current dam site.

Response

Comment noted. The goal stated on Page 4-103 of the Draft EIR/EIS is CIF's goal. The purpose and need of the proposed action which the Final EIR/EIS evaluates is to provide dam safety, not to recover steelhead. The presence of SCD and its effects on the river is an existing condition; it is not an impact of the project.

Comment FI-124

The DEIR/S does not adequately cover the possible unintended consequences of dam buttressing; selecting that option will render the entire EIR/EIS inadequate due to lack of adequate analysis. It is very possible that buttressing will impede the upstream course of the steelhead trout even more than the poorly designed fish ladder currently does, despite the new proposed fish ladder design, due to proximity to downstream flow at the location of the sluice gates. This will further endanger the continuing survival of the steelhead trout in the Carmel River.

Response

The new fish ladder design and siting are consistent with CDFG and NMFS current design criteria for fish passage. The sluice gate would be operated only intermittently (hours at a time and only several times a year). The upstream end of the ladder would be closed to prevent steelhead from moving out into the high velocity water in front of the sluice way during sluicing. The sluice gate would be situated at a location and orientation to minimize impacts to migrating steelhead.

Comment FI-125

The sluice gates may also have the unintended consequence of impeding the movement of the trout in the river by creating a strong downward flow at the top that might capture fish in the current and force them back through the sluice gate downstream.

Response

The sluice gate has been positioned to maximize sediment removal from upstream of the ladder and minimize the risk of fish to fallback through the sluice way when it is opened. Access from the ladder into the upstream channel will be prevented prior to and during sluicing events.

GENERAL COMMENTS

WRITTEN COMMENTS RECEIVED

June 4 letter from Don Redgwick

Comment GEN-1

I believe the most important issues are developing a diversion plan for the river during construction, doing the work with as little negative impact on the Carmel Valley Community as possible, mitigating the environmental impacts even handedly, considering the value of the dam as a settlement basin and calculating the cost benefit ratio of the various proposals without succumbing to political pressure from single interest groups.

Response

Thank you for your comment.

May 23 Community Meeting Questions from Victoria Kennedy / Sleepy Hollow Homeowners' Association

Comment GEN-2

What will be the penalty for non-compliance with conditions stated in EIR?

Response

It is not clear what non-compliance situations this comment is intended to reference. Agencies and local government issuing permits would enforce compliance with permit conditions. Construction monitoring would be conducted to assure that permit requirements, resource protection measures, and mitigation measures are followed. The Applicant's contracts would embody permit requirements, and the Applicant will require contractors to comply with the terms of their permits in the contracts.

Comment GEN-3

Who has the authority to control the site? Only CalAm, a private entity?

Response

As discussed above in response to Comment GEN-2, agencies and local governments issuing permits will enforce compliance at the site, as necessary. The Applicant will manage and direct contractor activities at the site.

Comment GEN-4

How are the residents to determine who is the responsible agency, e.g., whether it is Monterey County Zoning Administrator, Monterey Peninsula Water Management District, Monterey County Sheriff's Department, the lead agency Department of Water

Resources Department, U.S. Army Corps of Engineers, for each violation of the mitigation measures?

Response

The Applicant would coordinate with local residents through the on-site construction manager. The on-site construction manager will retain copies of all project permits and will provide residents with a list of contact information for permitting agencies on request.

Comment GEN-5

As this is a privately owned project with the lead CEQA agency's office located in Fresno, who is going to be the local responsible entity to force compliance with mitigation measures or problems with project activities?

Response

As discussed above in responses to comments GEN-2 through GEN-4, an on-site construction manager would retain copies of all permits. Local residents may request contact information for any jurisdictional agency or permit at any time. Agencies and local government issuing permits would enforce compliance with permit conditions.

June 30, 2006 letter from Trish Chapman/California Coastal Conservancy

Comment GEN-6

Learn from experience. The EIR/EIS does not refer to any of the literature on dam removal. If the dam removal literature was reviewed in developing the alternatives, it should be cited. If it was not reviewed, then it should be and the alternatives should be revised based on the experience of earlier work and research.

Response

An extensive review of dam removal literature was provided as part of the previous Recirculated Draft EIR (Duffy 2000). The RDEIR was reviewed and is cited and incorporated by reference as part of this EIR/EIS. The project engineers of Montgomery, Watson and Harza (MWH), are familiar with the practice and approach to dam removal in the industry.

Comment GEN-7

Alternative 2, Water Quality Impact Analysis. Where does this section start? Page 4.93 appears to be in the middle of the discussion, but there is no heading to mark the beginning.

Response

The section subhead for Alternative 3 was missing on this page in the Draft EIR/EIS. This has been corrected in the Final EIR/EIS by adding the subheading "Alternative 3 (Carmel River Reroute and Dam Removal)" on the page before the paragraph that begins "Water quality impacts and mitigation for Issue WQ-1."

Comment GEN-8

Vegetation and Wildlife Impacts. The impact of sediment released by sluicing operations on downstream aquatic habitat and aquatic fauna are not analyzed and should be. This would be an ongoing, permanent impact and could be significant.

Response

The intent of the comment is not clear. It states that this is a "vegetation and wildlife" impact, but then requests information on sluicing impacts to downstream aquatic habitat and aquatic life. The discussion of sediment impacts on downstream aquatic habitat and aquatic life due to sluicing has been expanded in Section 4.4 of the Final EIR/EIS.

Comment GEN-9

Appendix D. The figures referred to in the memo should be included.

Response

The figures are now included in Appendix G of this Final EIR/EIS.

June 20, 2006 letter from Mark Delaplaine/California Coastal Commission

Comment GEN-10

Pagination of Draft EIR/EIS: The pagination of the Draft EIR/EIS makes navigation of the report very difficult. We would appreciate it if the pagination included more than the main section number plus the page number, e.g., 1-x, 2-x, 3-x or 4-x, and included the subsection number as well, e.g., 1.2-x or 2.5-x, etc. In the CD Rom version, it would be helpful if references to other sections, including the table of contents, were hyper linked for easy navigation.

Response

Thank you for your comment. Pagination has been updated in the Final EIR/EIS. In addition, bookmarks for easier navigation are provided in the electronic copies of the Final EIR/EIS, which will be provided to most document recipients.

Comment GEN-11

Errata: The Draft EIR/EIS variously refers to Old Carmel River Dam (OCRD) as 1,500 feet (pg. 2-5), 1,700 feet (pg. 3-30), 1,800 feet (pg. 3-40) and 0.5 miles (pg. 4-102) downstream of SCD.

Response

Thank you for drawing attention to this inconsistency. The correct distance is 1,800 feet. The Final EIR/EIS has been corrected.

June 29, 2006 letter from David A. Berger / Monterey Peninsula Water Management District

Comment GEN-12

For project impacts and components that are common to all alternatives, the Final EIR/EIS (or FEIR/S) should fully describe level of impact and measures to mitigate for impacts. For example, the reconstruction and retrofitting of the bridge at Old Carmel Dam (OCD) is a component of all alternatives, so a full description of impacts and mitigation measures to make OCD passable at all flows should be included in the Final EIR/S.

Response

The EIR/EIS evaluates all impacts regardless of whether they are unique to an alternative, or held in common among more than one alternative. Impacts and mitigation measures, including those associated with the OCRD, are fully described. Improvement to provide fish passage at OCRD under all flows is not a purpose or need of the action that the EIR/EIS evaluates (although fish passage at San Clemente Dam is an objective of the project).

Comment GEN-13

Page 3-8, Para 4: "Approximately four miles upstream", should be corrected. Los Padres Dam is five miles upstream of San Clemente Dam (23.5 -18.5).

Response

Comment noted. Los Padres Dam (LPD) is five miles upstream, as stated and the Final EIR/EIS has been corrected.

Comment GEN-14

Page 3-30, Para 4: Under Old Carmel Dam Fish Ladder Improvements, the last sentence should be modified to read, "The right bank contains an open passageway approximately 4 feet wide by 15 feet high that at one time was equipped with a gate and operated as a sluiceway and control to raise water levels for operation of a diversion. This structure was modified in 1992 and 2000 by removing several stoplogs and the gate structure from the passageway."

Response

Thank you for this correction. This Final EIR/EIS includes this change.

Comment GEN-15

Comment on the following reference: Mussetter Engineering Inc. 2006b – Summary of Hydraulic and Sediment-transport Analysis of Residual Sediment: Options for the San Clemente Dam Removal/Retrofit Project, California.

Response

This appears to be an incomplete sentence in the comment letter.

June 15, 2006 letter from Pam Krone-Davis / RisingLeaf Watershed Art

Comment GEN-16

The community has rallied strongly behind the restoration of the lagoon and I am sure would support restoration projects in this area as well.

Response

Thank you for your comment.

April 5, 2006 letter from Dick Butler / NOAA's NMFS

Comment GEN-17

Figure 5: This caption appears to be for another, unrelated figure.

Response

This figure was in the Sediment Operation and Management Plan in the Draft EIR/EIS, but has been superseded by the revised Sediment Operation and Management Plan for Fish Passage (SOMP, Appendix J) in the Final EIR/EIS.

Comment GEN-18

Also, the [Sluice Gate] O and M Plan fails to address such concerns as changes in dam ownership, staffing, long-term funding, and budget crises. NMFS cannot approve such an intensive and risk prone plan, without considerable changes to the O and M Plan, and then it must be third party implemented, funded up-front, and bonded for at least 100 years to ensure that the steelhead resource will not be lost due to reasonably foreseeable events.

Response

This comment appears to relate to a NMFS approval action on a permit, and would be addressed during permitting. Under those alternatives for which the SOMP (Appendix J) would be implemented (the Proponent's Proposed Project or Alternative 1), there are no current or foreseen changes in dam ownership or budget crises. Funding for operation and maintenance of the dam, fish ladder and sluice gate would be provided through the normal budgetary process of the owner and paid by the revenues of the water system,

as regulated by the CPUC. A bond will not be necessary to maintain the fish ladder. It is not clear what is intended by the comment on "changes in staffing."

Comment GEN-19

Alternative 1: NMFS has many similar concerns between the Proponent's Preferred Project and this alternative. For instance, in FI-8: NMFS believes sluicing will not be beneficial to listed steelhead.

Response

The effects of sluicing under Alternative 1 are discussed in section 4.4 under Impact Issues FI-8 and FI-9b. Upstream Fish Passage for Alternative 1 is discussed in Section 4.4.3 and the corresponding impacts involve demolition of the old fish ladder, construction of a new ladder and implementation of the SOMP (Appendix J) to ensure upstream passage. Operation of the new ladder will improve passage conditions at San Clemente Dam, a benefit to fish passage compared to existing conditions. Although implementation of the SOMP will serve as mitigation for upstream fish passage, some sediment management actions, such as sluicing, could cause fishery impacts. Potential impacts associated with mitigation are addressed in FI-7 and FI-8. Notwithstanding these mitigation-related impacts, implementation of the SOMP will reduce overall impacts to steelhead.

June 30, 2006 comments from National Marine Fisheries Service (NMFS)

Comment GEN-20

Referring to page 3-86, 3.6.2, NMFS notes the last paragraph starting with the second sentence of the section appears to be a repeat from page 3-85, second paragraph.

Response

Comment noted. Thank you for this correction. The redundant paragraph has been deleted.

July 3, 2006 letter from Robert W. Floerke / Department of Fish and Game (CDFG)

Comment GEN-21

Another parameter of aquatic resource management that may be affected by the choice of alternatives is the ongoing process by which CAW complies with Order 95-10 by the State Water Resources Control Board (SWRCB) (subsequently supplanted by Order 2002-02). This Order occurred due to complaints filed by DFG and others which successfully argued that CAW diversion of waters were having an illegal and adverse effect on the public trust resources of the river. To date, DFG has participated in helping aid attain compliance with the Order by negotiating a Memorandum of Understanding (MOU) on an annual basis that regulates the bypass flows past the Dam. In the future it

will be necessary for DFG to bring CAW into a more standard form of compliance through the use of the more thorough SAA process that is consistent with Section 1600 of the DFG Code. The condition of steelhead in the Carmel River will diminish or improve over time, partially in response to the presence or absence of the Dam. If the population continues its general trend of decline, it will force the resource agencies to expend greater efforts and regulatory oversight on the remaining fish and wildlife resources in the Carmel River in regulatory processes such as the ongoing Order 2002-02. The project Operator should anticipate this eventuality and consider it in any long-term cost-benefit analyses they conduct. The increased scrutiny that will need to be paid to the management of steelhead as a result of the retention of the Dam may, over the years, end up placing a greater burden on CAW than the investment that could be made in the short run to effect Alternative 3.

Response

Thank you for this regulatory background and guidance. CAW [Applicant] will continue to work cooperatively with all appropriate permitting agencies during the implementation of this seismic safety project and for as long as they own the Dam.

Comment GEN-22

We have noted that there were some moderate ambiguities and unresolved issues in the description of Alternative 3, but have not addressed them in this letter (e.g. a curious absence of reference to the growing knowledge base pertaining to dam removal in the United States).

Response

An extensive review of dam removal literature was provided as part of the previous RDEIR (Denise Duffy & Associates, Inc. 2000). The RDEIR was reviewed and is cited. The project engineer (MWH) is familiar with the practice and approach to dam removal in the industry.

NOTE: COMMENTS COMMENT GEN-23 TO COMMENT GEN-34 CORRESPOND TO MAY 23, 2006 PUBLIC HEARING TESTIMONY

Comments Received at May 23, 2006 Public Hearing

Comment GEN-23

Charles Franklin/Resident

The concept of extending the term of the project to mitigate its impacts, it's a century of [sediment] accumulation, roughly, and shouldn't we try and mitigate it on that kind of time scale? Does that make any sense economically? I don't know. But I didn't quite get why this four- or five-year time span seemed necessary for the project. So you could do it over a hundred years very differently and probably pick up most of the seismic mitigation in the first five years.

Response

The four to five year time span refers to the estimated time it would take to complete Alternatives 1, 2, or 3 (the Proponent's Proposed Project could be completed in four years). The long-term SOMP is discussed in Appendix J. As described in Section 3.1, a previous EIR on the project (Denise Duffy & Associates, Inc. 2000) evaluated an alternative that would have released sediment over a 60 to 100 year period. This alternative was considered and eliminated due to its long-term effects on fish and water quality, due to its potential effects on flooding, and because the ability to control releases was not demonstrated. Seismic mitigation would occur through modifications to the Dam or dam removal, not through sediment release.

Comment GEN-24

Don Redgwick/Resident of Pacific Grove

The dam can serve many functions if left in place and strengthened. It can be managed to serve as a flood control protection which allow -- which would allow protection of the Carmel River basin if there is an allowance for storage during a storm. In other words, you have to keep the level down. A dam will support wildlife and migrating birds.

Response

SCD was not originally constructed for flood control or water storage, but to provide a point of diversion on the Carmel River and head for gravity feed into the water system. If left in place, it would be operated and maintained to fulfill its original purpose and would not be used to provide flood control or water storage.

Comment GEN-25

Victoria Kennedy/Sleepy Hollow Homeowners Association

If there's a problem with project impacts such as noise, start times, dust, traffic control deficiencies, what will be the remedy besides merely a phone number and a person's name to call?

Response

Construction monitoring would be conducted to assure that permit requirements, resource protection measures, and mitigation measures are followed. If problems such as those listed above occur, the Applicant and permitting agencies will require contractors to comply with these measures. The Applicant will coordinate with local residents through the on-site construction manager. The on-site construction manager will retain copies of all project permits and will provide residents with a list of contact information for permitting agencies on request

Comment GEN-26

Victoria Kennedy/Sleepy Hollow Homeowners Association

What would be the penalty for noncompliance with conditions stated in the EIR?

Response

See response to GEN-2.

Comment GEN-27

Victoria Kennedy/Sleepy Hollow Homeowners Association

Who has the authority to control the site? Only Cal Am, a private entity, or a non-private entity?

Response

See response to GEN-3.

Comment GEN-28

Victoria Kennedy/Sleepy Hollow Homeowners Association

Do the residents have to figure who is responsible – the responsible agency, whether it is a Monterey County zoning administrator or the water management district or the county sheriff's department?

Response

See response to GEN-4

Comment GEN-29

Victoria Kennedy/Sleepy Hollow Homeowners Association

As this is a privately-owned project with CEQA agency's office located in Fresno, who is going to be the local responsible entity to force compliance with mitigation measures or problems with project activities?

Response

See response to GEN-5

Comment GEN-30

Monica Hunter/Planning and Conservation League Foundation AND Carmel River Watershed Conservancy

I do want to bring up an element of this that hasn't been touched on tonight, and it represents the work of the conservancy and that is in establishing a watershed

management plan and implementing a watershed-wide approach to understanding the issues and challenges of protecting water quality, riparian habitat, river channel systems, and also the linkages to the lagoon and to the beach and some of the issues that are occurring there. I also want to mention that Carmel River watershed is a critical coastal watershed. And most of us are aware that within the state we have put tremendous effort and emphasis on a number of our programs, funding included, resources, technical expertise devoted to understanding how we can improve and protect the coastal watersheds. And this concerns impact to near-shore marine environments as well as protecting water quality for the benefit of communities; in this case, this community does rely on the Carmel River for many recreational and other local traditional uses. So I think the watershed context is something that we can't overlook. I think removing the dam structure of stabilizing the sediment, rerouting the river, restoring the flow of the river is something that in the long run the watershed management effort would most benefit from that. I think it would solve many problems and eliminate some of the costly bandaids that we're looking at in terms of trying to overcome the ongoing and permanent impacts as long as that structure remains in place.

Response

Comment noted.

Comment GEN-31

Roy Thomas/Carmel River Steelhead Association

I'd like to remind you of some problems with dealing with the Option 1 and 2. If you entomb a piece of concrete in the Carmel River, the cost isn't just the entombment. You've got a hundred, maybe two hundred years of maintenance on this block of concrete that, in fact, if we're all here, we'll still want to keep the fish and wild life and the recreation going on, on the river. People like to boat on that river and right now the boaters have to carry their boat around this obstruction.

Response

Comment noted. For health and safety reasons, no recreational use is authorized on the reservoir which would remain in the Proponent’s Proposed Project and Alternative 1. The Dam would be removed and sediment removed or stabilized in place in Alternatives 2 and 3.

Comment GEN-32

Nikki Nedeff/Resident of Carmel Valley

This is an incredibly complicated project. Indeed it is. Any of the alternatives have massive impacts, far-ranging impacts from traffic to environment, red-legged frog, economic, et cetera.

Response

Comment noted.

Comment GEN-33

Nikki Nedeff/Resident of Carmel Valley

This is an opportunity to look at this project in a broader context. This is one opportunity – removing San Clemente Dam – one opportunity to rectify a whole series of problematic issues on the Carmel River, including increasing water supply, which ultimately will benefit habitat in ways that removing the dam will not.

Response

Comment noted. Removal of the Dam would not increase water supply.

Comment GEN-4

Jessica Simms/Resident of Carmel Valley

What are the impacts of Alternative 3 on San Clemente Creek?

Response

The impacts of Alternative 3 on San Clemente Creek are discussed throughout Chapter 4 of this Final EIR/EIS.

June 27, 2006 letter from Laurence P. Horan / Law Offices of Horan, Lloyd, Karachale, Dyer, Schwartz, Law & Cook

Comment GEN-35

The use of our access road by trucks and other vehicles for the purposes outlined in the Draft EIS/EIR would create significant unmitigated impacts with respect to: (1) geologic stability; (2) vegetation; (3) different species of birds, including wild pigeons, mourning doves, California quail, and great blue heron; (4) red-legged frog; (5) California steelhead/salmon; (6) our river frontage and the despoliation and elimination of a significant number of acres of sensitive wetlands; (7) impaired air quality; (8) significant traffic safety impacts at the intersection of Cachagua Road and elsewhere on the property; (9) destruction of the pastoral rural quality of life which both the owners and their donee Park District have strived assiduously to maintain; and (10) destruction of a valuable historic resource: one of the first settler cabins in the Carmel Valley, which the owners have restored and which can never be duplicated.

It is almost unthinkable that the voluminous documents comprising the draft EIS/EIR pay virtually no heed whatever to the foregoing impacts, nor does it mention in any significant manner the fact of 960 acres of park land and the historic Murphy's cabin.

Response

Evaluation of the Cachagua Access Route with respect to each of the above-listed impacts can be found throughout Chapter 4 of the EIR/EIS. No alternative would destroy the Stone Cabin or remove the river frontage. This Final EIR/EIS includes recreation and land use sections, which evaluate impacts and mitigation measures for these resources areas. The air quality, noise, traffic and circulation, and aesthetics sections (Sections 4.7, 4.8, 4.9, and 4.11) have been updated with an evaluation of impacts to the users of the Stone Cabin.

June 27, 2006 letter from William H. Leahy/Big Sur Land Trust

Comment GEN-36

The San Clemente Dam has been documented in numerous scientific studies to be detrimental to the ecological viability of the Carmel River and poses a significant safety hazard for the community. The Big Sur Land Trust is supportive of a project that would provide for the long-term restoration of the river and its biological resources including the steelhead trout and California Red-Legged Frog. An opportunity such as that provided by removal of the San Clemente Dam should be viewed in the larger context of watershed restoration so that multiple objectives can be accomplished through expenditure of public and private funds. There is growing recognition of the value that dam removal can bring to restoring ecosystem function within river systems. The Carmel River is an important resource for all Californians and can be an example of creative collaboration for restoring ecosystem function and providing a safer, healthier watershed for current and future residents and visitors to this unique river. The Big Sur Land Trust welcomes the opportunity to be a partner in the restoration of this important watershed.

Response

The effects of the existing dam are part of the baseline environmental condition. They are not impacts of the project. Thank you for your comment regarding long-term restoration opportunities and your offer of partnership.

June 30, 2006 from Clive R. Sanders/Carmel River Watershed Conservancy

Comment GEN-37

We believe there is much study still needed on the whole process of ensuring that the end result is a river that Steelhead will be able to negotiate, work needed to ensure proper mitigation for the Steelhead and Red Legged Frogs during the years that a decommissioning will take place. May we expect an opportunity to review this material when it is assembled from the studies that have gone before?

Response

The Lead Agencies would chose a project alternative based on this Final EIR/EIS. The Notice of Determination (NOD) and Record of Determination (ROD) will provide public disclosure of the selected project. A decision as to whether or not to remove the Dam has not been determined. Public involvement would continue throughout project approval and permitting.

July 3, 2006 letter from Tim Jensen / Monterey Peninsula Regional Park District

Comment GEN-38

GIS ortho-photo quads for use as base-maps for comparison between all projects, which show project locations, specific project component sites, property boundaries, landmarks, geographic features, and include meta data in electronic format. This data is readily available.

Response

Figure 3.2-2 in Section 3.2 of this Final EIR/EIS provides this information (project components, property boundaries, landmarks, geographic features). Although Geographical Information System (GIS) ortho-photo quads were not used to create the map, the figure is adequate for the level of detail required in this EIR/EIS.

June 28, 2006 letter from Jim Crenshaw / California Sportfishing Protection Alliance

Comment GEN-39

Furthermore, we find that the Draft EIR/S fails to fully assess the impacts of the Proponent's Proposed Project (dam thickening), Alternative 1 (dam notching) or Alternative 2 (dam removal and transport of sediment to a nearby canyon), and therefore the Draft EIR/EIS is inadequate for selecting any of the other alternatives.

Response

Impacts of all these alternatives are discussed in this Final EIR/EIS. This comment does not identify which impacts are believed to be not fully assessed.

Carmel River Steelhead Association Comments on San Clemente Environmental Impact Report

Comment GEN-40

The fish ladder on the old Camel River Dam is located on the south end not the north.

Response

The river generally runs south to north. The fish ladder is located on the west side of the Carmel River.

June 28, 2006 letter from Bob Baiocchi/Carmel River Steelhead Association

Comment GEN-41

When a dam owner builds a dam on a public waterway, it should be understood that the dam would be removed from the public waterway when the dam becomes obsolete. In the case of the San Clemente Dam, it was built in 1921 and the reservoir has become filled with sediment. The San Clemente Dam and Reservoir is obsolete. It is unreasonable and not in the public interest for any dam owner or water diverter in California to built a dam and not be responsible for it when the dam's life has ended. The duty and responsibility of the removal of the San Clernente Dam is that of Cal-American Water Company, and not that of the public or public agencies.

Response

SCD is not considered obsolete. The alternatives that would retain the Dam, including the Proponent's Proposed Project, would continue its useful life indefinitely. The reservoir has never served flood control or water storage purposes, and the accumulation of sediment in the reservoir has not impaired the ability of the facility to continue to provide its original function, as a point of diversion for California American Water (CAW).

GEOLOGY

WRITTEN COMMENTS RECEIVED

June 20, 2006 letter from Mark Delaplaine/California Coastal Commission

Comment GEO-1

Comment

Page 4-10 of the Draft EIR/EIS describes mitigation for issue GS-4, Soil Erosion, but includes mitigation only "with implementation of standard erosion control methods and BMPs on the down slope side of all construction zones." [underlining added]. The Draft EIR/EIS should include soil erosion mitigation and BMPs upslope as well as down slope of construction zones.

Response

We agree that implementation of standard erosion control methods and Best Management Practices (BMPs) such as those in the Storm Water Pollution Prevention Plan (SWPPP, Appendix K) would apply to all disturbed areas during construction, including both the upslope and downslope sides of all construction zones. The text in the Final EIR/EIS has been revised accordingly.

June 29, 2006 letter from David A. Berger/Monterey Peninsula Water Management District

Comment GEO-2

Page 3-54, Para 6: "Improvement of the existing road would consist of widening the road to 20 feet (minimum width of 15 feet with turnouts for passing in tight reaches), improving the radius of curvature at sharper curves to allow passage of large trucks, and constructing a drainage ditch along the uphill edge of the road." The existing roadway is very narrow at 10-12 feet in width and built on steep slopes that frequently wash out during the winter. The FEIR/S should fully evaluate the erosion potential along the access road and include mitigation measures to minimize impacts from increased runoff and soil erosion.

Response

This subject is discussed under Impact Issue GS-2: Access Route Landslides/Slope Stability. As stated under the mitigation for Impact Issue GS-2, "Prior to conducting access road improvements, a qualified geotechnical engineer or engineering geologist would survey all road rights-of-way to provide construction design specifications that would avoid any potential for landslides. To ensure slope stability, BMPs developed during design specifications would be implemented in addition to applicable ones identified in the SWPPP (Appendix K)" This would mitigate any impact to a less than significant level.

Comment GEO-3

Page 4-5 Regional Seismicity. The third paragraph cites the Converse Consultants 1982 report as evidence that the Cachagua Fault zone is not active. This discussion should reference a more recent study of the Cachagua Fault that was conducted for MPWMD as part of geotechnical investigations for the New Los Padres Reservoir project. Pertinent discussion is found in the final report titled Geotechnical and Engineering Studies for the New Los Padres Water Supply Project (The Mark Group, March 16, 1995, see page 5-8).

Response

The section has been updated in this Final EIR/EIS to include information from the Geotechnical and Engineering Studies for the New Los Padres Water Supply Project, and other more recent references. The conclusion remains the same as in the Draft EIR/EIS.

Comment GEO-4

Page 4-6 Table 4.1-1: Estimated Peak Acceleration of Specific Faults. The estimated peak horizontal acceleration for the named nearby faults is based on a calculation methodology from 1981 (see footnote 3), which may not adequately reflect revisions for more recent seismic events, including the Loma Prieta (1989) and Northridge (1994) events. These calculations should be revisited to ensure that the selected seismic design criteria are appropriate and consistent with more current methodology.

Response

The estimated peak acceleration and MCE has been described using the 1995 report by WCC and the 1995 Mark Group report for the New Los Padres Water Supply Project. Both of these studies consider the lessons learned by the Northridge and Loma Prieta earthquakes. The project description does not require modification based upon this information. As stated in section 3.2 of the EIR/EIS, in 2004 MWH reviewed and approved the approach in the 1995 WCC report. The Division of Safety Dams (DSOD) approved the design criteria in 1998 and approved contract drawings and specifications for the seismic retrofit of San Clemente Dam (SCD) in 2001. When the owner updates the application to DSOD to construct the project, DSOD will review the previously approved design, or the new final design if submitted, using current criteria. To be approved, the new design would have to meet the design criteria in place at the time the construction.

Comment GEO-5

Page 4-13 Alternative 3 (Carmel River Reroute and Dam Removal). Issue GS 4: Soil Erosion, briefly discusses the risk of erosion along access road improvements, in sediment disposal areas, and from sediment and rock discharges to streams. However, no discussion is given to assess the potential for destabilization of slopes resulting from the erosive forces of the Carmel River over the course of its rerouting through the San

Clemente Creek channel. More specifically, what is the significance of the potential for high-river flows along the San Clemente Creek channel to destabilize the base of the channel slopes and possibly produce rockfalls, landslides or debris flows that could partially or completely block the channel, and result in impoundment of the river behind such a blockage? **(Also HY-9)**

Response

The canyon walls that would be exposed after dam removal and excavation of sediment will not have vegetation, and there will be residual sediment on the walls and channel bed that could not be excavated. The walls may be subject to rockfall or even mass wasting from rainfall or river flow. Some of the bedrock in the area will help stabilize the canyon walls, but to what extent is uncertain. This effect would be anticipated in Issues WR-2a and WR-4a. These issues evaluate impacts due to changes in sediment flux passing the San Clemente Dam site, and changes in sediment composition downstream of the dam site. The evaluation includes consideration of erosion of sediment deposits upstream of the Dam that were not removed during excavation.

June 30, 2006 letter from Trish Chapman/California Coastal Conservancy

Comment GEO-6

Alternative 3, Issues GS-5: Diversion Bypass Blasting. As stated in the EIR under Alternative 3, blasting to create the diversion bypass channel will "irretrievably alter the landscape by removing approximately 145 acre-feet of rock…." (p. 4-14). Irretrievably altering the topography in such a substantial way should be a significant impact.

Response

The rock resource has not been identified as warranting specific protections or preservation. As such, its removal would not constitute a significant impact. Its removal is disclosed in the EIR/EIS, and the loss of the resource is described as irretrievable, but not significant.

June 14, 2006 letter from Lewis Rosenberg

Comment GEO-7

The Draft EIR/EIS presents an uneven emphasis of the various constraints to the proposed project. Specifically, the "Geology and Soils" section is only 13 pages long, whereas other constraints are discussed in more detail, for example, the fisheries section is 61 pages long, and the traffic and circulation section is 53 pages long. No doubt that each of the environmental setting areas is important, but for a proposed project with "seismic retrofit" in the title, there should be more detail on the seismic constraints, even if the information in included in an appendix section.

Response

Under NEPA and CEQA we are required to provide sufficient information for an issue as determined by its potential effect. The level of discussion in the Section 4.1 Geology and Soils section is proportional to the expected effects and appropriately identifies the significance of potential impacts. The section has been updated to reflect more recent information pertinent to the analysis of geology and soils based on other comments.

Comment GEO-8

The State of California Business and Professions Code section 7832 (person practicing or offering to practice geology subject to provisions of Geologist and Geophysicist Act) and section 7872(a) (practice without legal authorization), require that the preparer of the geology section is licensed as a Professional Geologist by the State of California Board for Geologists and Geophysicists. On page 6-2 of the Draft EIR/EIS, Mr. Rick McCartney is listed as the preparer for the geology subject area. The State of California Board for Geologists and Geophysicists website shows a "Richard F. McCartney" license PG 5140. However, it is unknown if this is the same person as the report preparer.

Because the proposed project strongly affects public safety, the geology preparer should be a California-licensed Professional Geologist (preferably also a Certified Engineering Geologist), and should sign the report as required by section 7835 (required preparation of plans by Professional Geologist - signing or stamping with seal).

Response

License PG number 5140 is held by Richard F. McCartney, the preparer of the Geology and Soils section in the Draft EIR/EIS. The section was modified for the Final EIR/EIS by Daniel R. Tormey, Ph.D., PG number 5927. Neither the California Environmental Quality Act (CEQA) nor the National Environmental Protection Act (NEPA) require a Registered Geologist to prepare or stamp the applicable impacts analysis (CEQA Guidelines Section 15149). During the final design phase of the project, geologists, engineers, and geotechnical engineers would develop appropriate design specifications for the project. These design specification documents will be stamped by the appropriate registered professional.

Comment GEO-9

The regional geologic map (Figure 4.1- 1: Geology of the Site Vicinity) is not the current published geologic map. Although the citation on figure 4.1-1 is from the "2000 RDEIR produced by Denise Duffy & Associates," the map is likely from Converse Consultants 1986 report on "New San Clemente Project preliminary design and cost estimate." The most recent published map of the area is the "Geologic map of the Monterey Peninsula and Vicinity" by T.W. Dibblee, Jr. (published in 1999 by the Dibblee Geologic Foundation as their map DF-71). Much of the geology on the Duffy and Dibblee maps

are similar owing to that Dibblee's mapping was the source material. However, figure 4.1-1 should incorporate the 1999 Dibblee map because it is printed in color and easier to read, but most importantly, the map shows the faults differently than the Duffy map. For example, the Dibblee map depicts an east-west striking fault approximately 1/2-mile southwest of the existing reservoir. This fault is not shown on the Duffy map.

Response

The Geologic Map (Figure 4.1-1) of the Monterey Peninsula and Vicinity by T.W. Dibblee, Jr., published in 1999 has been reviewed and incorporated into the Geology and Soils Section 4.1 of the Final EIR/EIS. Incorporation of this more current map does not change the results of the review.

Comment GEO-10

The discussion of regional seismicity (page 4-5) contains obsolete terminology for fault activity as defined by the California Division of Safety of Dams (DSOD). The term "capable" is no longer used by the DSOD to describe faults that show displacement at or near the ground surface within the last 35,000 years. Instead, the DSOD uses the terms "Latest Pleistocene active fault" and "conditionally active fault" to describe faults with movement in the last 35,000 years (W.A. Fraser, 2001, Fault activity guidelines of the California Division of Safety of Dams: California Geological Survey Bulletin 210, p. 31 9-323). The Draft EIR/EIS should evaluate the fault activity of the Cachagua and Tularcitos Faults using current DSOD methodology.

Response

The text in this Final EIR/EIS has been updated to reflect this comment. See Section 4.1.

Comment GEO-11

The discussion of fault activity does not use the most current information. The geotechnical report commissioned for the proposed New Los Padres Dam (The Mark Group, Inc., 1995) contains detailed evaluation of the activity of the Cachagua Fault, which is the closest fault to the San Clemente Dam. The Mark Group report uses geomorphic evidence to show that the Cachagua Fault has not moved within the last 85,000 years. Work by L.I. Rosenberg and J.C. Clark (Quaternary faulting of the greater Monterey area: report to USGS National Earthquake Hazards Reduction Program, 1994) used radiocarbon dating to demonstrate Holocene activity on the Tularcitos Fault. These more recent reports help address the issue of "of great importance from the point of view of dam design is the question of whether nearby faults are active or not" (Draft EIR/EIS, page 4-5).

Response

The text in this Final EIR/EIS has been updated to reflect this comment. See Section 4.1. The results of the review have not changed.

Comment GEO-12

The section on ground shaking (page 4-5) covers the time period from 1800 to 1985, but leaves out the last 21 years. A search of the Northern California Earthquake Data Center database as of June 14, 2006 shows 53 earthquakes of magnitude 4 or greater since 1985 within 60 km of the dam, which are the same parameters in the Draft EIR/EIS. The analysis of earthquake recurrence intervals should be revised to include these more recent data.

Response

The recurrence interval has been updated to reflect more recent reports of seismicity in the area. A Maximum Credible Earthquake (MCE) and ground accelerations have not been changed as a result of this information.

Comment GEO-13

There is no discussion of the effects of earthquakes on San Clemente Dam, such as the 1989 M 7.0 Loma Prieta earthquake. What were the effects of the Loma Prieta earthquake on the San Clemente Dam? The section also does not discuss effects of other large local earthquakes such as the 1926 M6.1 Monterey Bay doublet or the 1984 M4.9 Big Sur earthquake. Does Cal-Am have repair records for the San Clemente Dam that would provide information on the effects of these earthquakes on the dam? If so, these should be reported to help understand how the dam performs during earthquakes.

Response

California American Water (CAW) was contacted on Thursday, July 27 2006 and indicated that there were no repair records available, and no evidence that any repairs were necessary on the Dam as a result of earthquakes since the construction of the Dam in 1921. DSOD conducted an inspection of the Dam after the Loma Prieta earthquake, and their records indicate no reports of damage.

Comment GEO-14

The section on dam site geology (p. 4-5 to 4-6) does not really describe the site geology, other than to relate that "the dam site is underlain by granitic rocks and smaller amounts of older metamorphic rocks now included in the granitic mass." The various geologic reports done by Rogers E. Johnson and Associates for the proposed New San Clemente Dam project provides much useful information about the dam site geology. These should be summarized in a revised dam site geology section.

Response

The text of the section has been revised in this Final EIR/EIS to include more recent and more site-specific descriptions of geology. See Section 4.1.

Comment GEO-15

This section also contains evaluation of the Maximum Credible Earthquake (MCE) and estimated peak acceleration of specific faults. These topics would be better placed in a seismology section. Nevertheless, there are some technical difficulties with the Draft EIR/EIS. The DSOD uses maximum earthquake magnitude, slip rate, fault type, distance to the site, and geologic site conditions to evaluate earthquake hazards (W.A. Fraser and J.K. Howard, 2002, Guidelines for the use of the consequence-hazard matrix and selection of ground motion parameters: California Division of Safety of Dams). Only distance to the site and geologic site conditions are discussed in the Draft EIR/EIS. The other topics should be provided in a revised section.

Response

The estimated peak acceleration and MCE has been described using the 1995 report by Woodward-Clyde Consultants (WCC) and the 1995, The Mark Group report for the New Los Padres Water Supply Project. The project description does not require modification based upon this information. As stated in section 3.2 of this Final EIR/EIS, in 2004, the engineering firm of Montgomery, Watson and Harza, Inc. (MWH) reviewed and approved the approach in the 1995 WCC report. DSOD approved the design criteria in 1998 and approved contract drawings and specifications for the Seismic Retrofit of San Clemente Dam in 2001. When the owner files an application to DSOD to construct the project, DSOD will review the previously approved design or the new final design, if submitted, using current criteria. To be approved, the final design would have to meet current design criteria in place at the time the construction application is submitted.

Comment GEO-16

The information in table 4.1-1 (estimated peak acceleration of faults) is based on vague assumptions and outdated methodology. First, the "estimated Maximum Credible Earthquake magnitude (local)" is unclear because as the report disclaims, "Magnitudes and peak horizontal accelerations are based on assumed fault capability. The capabilities of these faults have not been rigorously investigated." In order for the reader to evaluate if these magnitudes are appropriate for the individual faults, the fault rupture length and fault-length vs. magnitude method needs to be specified for each fault.

Response

The geology section in this Final EIR/EIS has been revised to include more recent evaluations of MCE and peak accelerations by WCC and the Mark Group (both 1995). These reports describe the correlation between fault length and rupture length versus earthquake magnitude.

Comment GEO-17

The cited "estimated peak horizontal acceleration 50th percentile" uses the equations of "Joyner and Boore (1981)." The work of Joyner and Boore (1981) has been superceded by Boore and others (Seismological Research Letters, v. 68, no. 1, 1997) that reflects

post- Loma Prieta and Northridge earthquake ground shaking equations. Using these older equations could result in accelerations that are too low; which is a critical concern for the proposed project. The accelerations should be recalculated using current ground shaking equations and include the site class and site period used in the calculations. In addition, the DSOD recommends using the 84th percentile acceleration in cases of high or extreme consequence (Fraser and Howard, 2002), so it might be necessary to include additional percentile statistics if the proposed project falls into these categories.

Response

The text of the geology section has been modified to include the methods of Idriss (1993) and Geomatrix (1992) for determining ground accelerations. As stated in section 3.2 of this Final EIR/EIS, in 2004, the engineering firm MWH reviewed and approved the approach in the 1995 WCC report. DSOD approved the design criteria in 1998 and approved contract drawings and specifications for the Seismic Retrofit of San Clemente Dam in 2001. When the owner files an application to DSOD to construct the project, DSOD will review the previously approved design or the new final design, if submitted, using current criteria. To be approved, the final design would have to meet current design criteria in place at the time the construction application is submitted.

Comment GEO-18

It is unclear as under what conditions the dam is unstable. Is it the 0.9 "g-force" (cited as footnote 6 in table 4.1-I), or is it the 0.68g peak horizontal acceleration for the Tularcitos Fault (listed in table 4.1-I)? It is unclear as to whether the dam will fail at one of the maximum postulated ground motions, or is it so unstable that it will fail at a lesser ground motion. Provide the ground motion at which the dam is calculated to fail so the reader can better understand the dam stability. Without an accurate assessment of ground motions, it difficult to evaluate if the proposed project meets the purpose of "to meet current standards for withstanding a Maximum Credible Earthquake" as stated in the Draft EIR/EIS, information cover sheet. Otherwise, how do we know that the impact of thickening the dam is "less than significant"?

Response

The MCE on the Tularcitos Fault is magnitude 6.5, with a peak horizontal acceleration at the Dam of 0.70 g. The MCE for the San Andreas Fault is magnitude 8.0, with a peak horizontal acceleration at the Dam of 0.19 g. As such, the MCE and ground acceleration from the Tularcitos Fault sets the design conditions at the Dam. As stated in section 3.2 of this Final EIR/EIS, in 2004, the engineering firm MWH reviewed and approved the approach in the 1995 WCC report. DSOD approved the design criteria in 1998 and approved contract drawings and specifications for the Seismic Retrofit of San Clemente Dam in 2001. When the owner files an application to DSOD to construct the project, DSOD will review the previously approved design or the new final design, if submitted, using current criteria. To be approved, the final design would have to meet current design criteria in place at the time the construction application is submitted.

Comment GEO-19

The section on landslides could have more detailed information. It states that a landslide could be triggered by a seismic event, but cites a 1998 report by Woodward-Clyde Consultants that the abutments were found to be stable. Yet, on page 4-9 of the Draft EIR/EIS, it states that "landslides could be triggered during the construction or operation of the Proponent's Proposed Project by oversteepening hillsides during the improvement of access routes," the discussion of which is not included in the "Environmental Settings" section. Nor is there any discussion of Reservoir Landslides/Slope Stability (Issue GS-3) in the "Environmental Settings" section. It would be useful to include the Woodward-Clyde report and the information used for the reservoir landslides as appendices, or to at least provide some details of the analyses to help the reader to draw their own conclusions from the data.

Response

The landslides portion of the geology section has been updated in this Final EIR/EIS to include more discussion of landslides. See Section 4.1. The supporting technical reports are available from the lead agencies for review by interested parties.

June 14, 2006 letter from Linda Agerbak

Comment GEO-20

EROSION, POLLUTION, FIRE: Serious and ongoing steps must be taken to monitor and minimize run-off and erosion caused by construction activities. Steps must also be taken to minimize the increased risk of forest fire.

Response

Measures to minimize run-off and erosion caused by construction activities are discussed in Section 4.3 Water Quality and in the SWPPP (Appendix K). The BMPs included in the Fire Prevention and Suppression Plan (Appendix Z) include such items as installing spark arrestors on vehicle exhaust pipes, etc. These BMPs would provide fire prevention and suppression measures during construction.

HYDROLOGY

WRITTEN COMMENTS RECEIVED

May 24, 2006 letter from Don Redgwick

Comment HY-1

It can be managed to serve as flood control protection which would help protect the Carmel River Basin.

Response

SCD was not originally constructed for flood control or water storage, but to provide a point of diversion for CAW on the Carmel River and head for gravity feed into the water system. The original capacity of the San Clemente Reservoir was 2,200 acre-feet and the current capacity is 100 AF. Even if the reservoir were dredged and returned to the original capacity, the storage volume would not be sufficient to provide downstream flood control. During a large flood, reservoir storage would rapidly fill on the rising limb of the hydrograph and the peak flow would pass through a full reservoir nearly unaltered, even if the reservoir were completely empty at the start of the flood.

June 30, 2006 letter from Trish Chapman/California Coastal Conservancy

Comment HY-2

Alternative 3 Impact Analysis. The impact analysis for Alternative 3 does not adequately describe or evaluate the hydrology and water resources impacts. A list of additional issues that should be evaluated include: capacity of San Clemente Creek to transport the water, sediment, and woody debris diverted from the Carmel River into the creek. Analysis should evaluate things such as volume and velocity at peak flows, potential for bank or channel scour as a result of changed hydrology, potential for log jams, etc.

Response

The final channel design will be based on detailed hydraulic analysis of the channel slope, cross section, and sediment material for a series of flows, ranging from bankfull to the design flood. Based on pre-dam data for San Clemente Creek, there would be appropriate capacity to convey the combined flow of the creek and Carmel River, transport sediment, and convey large woody debris. Figure 4.2.3 of the Final EIR/EIS shows typical cross section used in the sediment transport modeling of Alternative 3 that would be based on the hydraulic characteristics of the river.

Comment HY-3

Alternative 3 Impact Analysis. The impact analysis for Alternative 3 does not adequately describe or evaluate the hydrology and water resources impacts. A list of additional issues that should be evaluated include: changes to channel bed geometry in San

Clemente Creek – aggrade or degrade the creek bed. If the creek bed degrades, how far upstream would this degradation be expected to migrate?

Response

The restoration of San Clemente Creek would be designed to provide a geomorphically stable channel that will neither aggrade nor degrade. Also see response to Comment HY-2.

Comment HY-4

Alternative 3 Impact Analysis. The impact analysis for Alternative 3 does not adequately describe or evaluate the hydrology and water resources impacts. A list of additional issues that should be evaluated include: changes in groundwater elevation along the abandoned portion of the Carmel River channel.

Response

After the Carmel River flow is bypassed into San Clemente Creek, the water table underlying the bypassed section of the river would decline. This would be a less than significant impact to groundwater resources.

June 29, 2006 letter from David A. Berger/Monterey Peninsula Water Management District

Comment HY-5

Page 2-5, Para 2: Description of Reroute and Dam Removal, the statement, "The San Clemente Creek channel would be reconstructed through its historic inundation zone from the exit of the diversion channel to the damsite…", conflicts with the description provided on page 3-81, where the reconstruction is defined as the same as described in section 3.3 for the notching alternative. The notching alternative references reconstruction only in the uppermost 900-foot long section of the inundation zone. Also note the comments on Page 3-81 concerning routing the combined flows from the mainstem and San Clemente Creek through the historic San Clemente Creek channel.

Response

The last line of Page 3-81 that states that the channel would be the same as described in Section 3.3 is incorrect. The channel will be sized to convey the low and high flows of the combined Carmel River and San Clemente Creek flows and to be geomorphically stable. The final design of the channel will accommodate the combined flow of both streams as described in Section 4.2.

Comment HY-6

Page. 3-56 and 3-57 – a three-stage channel is proposed for the remaining reservoir sediments. The profile of the remaining sediments indicates that two very different channels would need to be constructed – one for a relatively steep channel in a narrow

valley and one for a meandering channel in wide alluvial flat. No performance measures are suggested that would indicate how these channels would be monitored or maintained.

Response

The design of the geomorphically stable channel would identify the channel bed slopes and the cross sectional shapes of the channel sections along the channel length. As required under CEQA, mitigation monitoring measures would be prepared by the Applicant to accompany findings before project approval is made. A mitigation monitoring plan would also be developed in cooperation with the appropriate regulatory agencies during the permitting phase of the project and would incorporate final design information.

Comment HY-7

Page 3-80, Para 1: "The channel profile and section in Figure 3.5-3 show only the general geometry of the channel construction as used in the MEI hydraulic analyses…" The referenced figure shows the profile of the haul road. The FEIR/S should provide full documentation of the proposed channel geometry through the diversion channel and the post-project channel in the post-project San Clemente Creek channel downstream of the diversion channel.

Response

The figure referenced in the comment was inadvertently left out of the document. See MEI's *Summary of Hydraulic and Sediment-transport Analysis of Residual Sediment* (Appendix N) for a generalized bed profile for the restored channel. Note that this profile may change during the design of the channel as explained in Comment HY-6.

Comment HY-8

Page 3-81, Para 5 & 6: "The San Clemente Creek stream channel would be exposed and require reconstruction." The reconstructed channels described in Section 3 are not likely to be suitable for construction through the San Clemente Creek arm of the reservoir. The entire flow from the Carmel River mainstem, plus natural flows in San Clemente Creek must be routed through a reconstructed channel. Further, it is not clear why it would be necessary to excavate in the San Clemente Creek arm down to the pre-1921 level, except at the confluence with the mainstem. It is quite likely that the historic creek configuration near the bottom of the valley would be too narrow and would not be stable enough geomorphically to handle the increased flow. Instead, a wider channel at a higher level would probably be required to pass the combined flow of the creek and mainstem.

Response

The restored channel for Alternative 3 would be designed to convey the combined flow. The available hydraulic capacity of San Clemente Creek was investigated by MEI and it

was determined that the available cross sectional area in San Clemente Creek would be sufficient to convey the combined flow of both streams. The excavation would be carried to an elevation near the historic San Clemente Creek channel invert to minimize the scour of sediment that would remain between the historic bed and the new channel bed. The final cross section, and bed slope of the restored channel would be designed to convey the anticipated sediment load and water.

Comment HY-9

Page 4-13 Alternative 3 (Carmel River Reroute and Dam Removal). Issue GS 4: Soil Erosion, briefly discusses the risk of erosion along access road improvements, in sediment disposal areas, and from sediment and rock discharges to streams. However, no discussion is given to assess the potential for destabilization of slopes resulting from the erosive forces of the Carmel River over the course of its rerouting through the San Clemente Creek channel. More specifically, what is the significance of the potential for high-river flows along the San Clemente Creek channel to destabilize the base of the channel slopes and possibly produce rockfalls, landslides or debris flows that could partially or completely block the channel, and result in impoundment of the river behind such a blockage? **(Also GEO-5)**

Response

See response to Comment GEO-5, above. Under both Alternatives 2 and 3, the historic channel banks of San Clemente Creek or the Carmel River would be exposed following dam removal and excavation of the stored sediment. Under both proposed dam removal alternatives, at the damsite, it would be about 60 feet from the current top of the sediment down to the proposed new channel elevation. In this portion of the project area, the banks of San Clemente Creek and the Carmel River have been under water, and more recently sediment, since the Dam was completed in 1921. Once these hill slopes are exposed following dam removal, there would be a period of time before upland vegetation is reestablished during which either surface erosion (rilling) or mass wasting (landslides) is possible. The existence, frequency, and magnitude of these erosion events are speculative at this time. The length of time it would take for the denuded hill slope above the channel to reestablish vegetation in order to minimize erosion is unknown. The restored channel for both alternatives would be designed to accommodate the anticipated sediment loads in the river and high flows without erosion of the channel bed or banks.

Comment HY-10

Page 4-19, Para 4. While the theoretical peak capacity of the spillway may be 20,300 cfs, the actual capacity is much less, due to debris flow that often blocks ports during high flows (see comment on Page 3-24 and picture above).

Response

Comment noted. Any blockage of the spillway bays would reduce the capacity of the spillway. The statement in the Final EIR/EIS should be considered an upper limit that is independent of factors such as debris blockage.

Comment HY-11

Page 4-20 to 4-23, Table 4.2-2. It appears that the table shows the maximum peak mean daily flow in cfs, while the title of the table seems to indicate that this is a monthly rate. USGS reports flows on a mean daily basis. Please also review text on page 4-19 that discusses monthly flows. Should this be mean daily flows?

Response

Table 4.2-2 refers to the peak average daily flow recorded for each month during the period of record. The text has been corrected in the Final EIR/EIS.

June 30, 2006 letter from Patricia Sanderson Port / U.S. Fish and Wildlife Service

Comment HY-12

Page 4-19, Section 4.2.1 Environmental Setting - Carmel River Hydrology, first full paragraph, last sentence: Instantaneous peak flows of 16,000 cfs on March 10, 1995, and 14,700 cfs on February 3, 1998, - both larger than the 9,000 cfs reported in the document - can be found on the U.S. Geological Survey (USGS) website for the Carmel River at Robles del Rio site at:

http://nwis.waterdata.usgs.gov/nwis/peak?site_no=11143200&agency_cd=USGS&format=html

Response

This paragraph was summarizing the data shown in Table 4.2-2 and references the maximum average daily flow per month, not the instantaneous peak flow recorded at the gage. The text in the Final EIR/EIS has been corrected to clarify.

Comment HY-13

Pages 4-20 and 4-21, Table 4.2-1 Average Monthly Flow: The table provides more significant figures than are found in the original data presented at the USGS website at:

http://nwis.waterdata.usgs.gov/nwis/monthly/?site_no=11143200&agency_cd=USGS

thereby implying greater precision than the data actually have (USGS presents only three significant figures below 1,000 cfs; table 4.2.1 presents as many as five).

Response

The additional significant digits were a result of averaging the average daily data. The table has been corrected in the Final EIR/EIS to reflect the appropriate level of significant digits.

Comment HY-14

Pages 4-22 and 4-23, Table 4.2-2 Peak Monthly Flow for Period of Record: The table title is ambiguous - apparently what is reported is the highest daily mean flow for each month - distinguished from the instantaneous peak flow referenced in our first comment. More information about USGS surface water data in California can be obtained from Donna Schiffer, Chief, Statewide Hydrologic Monitoring and Information Office, USGS Water Science Center at (916) 278-3097 or shiffer@usgs.gov.

Response

The table title has been changed for clarification. Comment noted.

NOTE: COMMENTS HY-15 THROUGH HY-16 CORRESPONDS TO MAY 23, 2006 PUBLIC HEARING TESTIMONY

Comment HY-15

Roy Thomas/Carmel River Steelhead Association:

I want to also remind you that when you start making new rivers, if you remember your own slide up there with acres and acres and acres of wood in the reservoir, if you don't make your new river wide enough, you'll have a new dam and it will be a wooden dam, so you have to pay attention to that.

Response

Comment noted.

Comment HY-16

Jessica Simms/Resident of Carmel Valley:

What are the impacts on San Clemente Creek? And how prone is it to flooding in the winter and how much of the banks will be eroded from that?

Response

The hydraulic analysis of the combined flow of the bypassed Carmel River and San Clemente Creek indicates that there would be sufficient capacity in the San Clemente Creek arm to create a channel that would convey the combined flow. Although a geomorphologically stable channel would be created through the former reservoir impoundment area, there would still be the potential for that the channel would move or reconfigure itself in response to flow or background sediment loading. The extent of

bank erosion during such a dynamic process or the potential for hillslope erosion uphill of the channel is speculative at this time. However, if large-scale erosion were to occur, the additional sediment load from the event would flow to the channel along with the natural background load of the Carmel River and San Clemente Creek. This combined sediment load would be conveyed downstream depending on the sediment transport capacity of the Carmel River.

Carmel River Steelhead Association Comments on San Clemente Environmental Impact Report

Comment HY-17

The hydraulics of putting a river into a creek channel needs analysis, not only channel width and depth needs consideration but the number and sharpness of bends are a concern. The Carmel River carries heavy loads of wood at times. We don't need a log jam dam.

Response

This question addresses design issues for the final channel. In general, the design would consider the magnitude of high and low-flow events in the river/creek, sediment loading, available channel cross-section, and the desired channel slope. These factors would be incorporated into the final design of the channel.

LAND USE

WRITTEN COMMENTS RECEIVED

June 29, 2006 letter from David A. Berger / Monterey Peninsula Water Management District (MPRPD)

Comment LAND-1

Page 3-48, Para 4: "The use of site 4R as sediment disposal site and access easements would need to be negotiated with the District." Are there land use restrictions currently in effect at this site? Does the Park District have plans or policies that would prevent the use of this site?

Response

This comment has been addressed in Section 4.13, Land Use, in this Final EIR/EIS

June 27, 2006 letter from Laurence P. Horan / Law Offices of Horan, Lloyd, Karachale, Dyer, Schwartz, Law & Cook

Comment LAND-2

Any of the alternatives explored in the draft EIS/EIR which would utilize the access road to the property from Cachagua Road to the area of the San Clemente Dam, any rerouting of the Carmel River in that area, or any deposition of any of the silt accumulated behind San Clemente Dam would create a situation in which the use of our remaining property and the historic Murphy stone cabin, the use of the Park District's property for scenic and park purposes, or the maintenance of the terms of the scenic conservation easement imposed by us some 36 years ago would be vitiated. **(Also REC-2)**

Response

The project has been redesigned so that access to the Stone Cabin would not be obstructed. None of the alternatives would reroute the Carmel River in the area near the Stone Cabin. Potential Impacts relating to the users of the Stone Cabin are discussed in Sections 4.13, Land Use, and 4.12, Recreation in the Final EIR/EIS. Impacts to Stone Cabin and its users are also discussed in Sections 4.7 (Air Quality), 4.8 (Noise), 4.9 (Traffic and Circulation) and 4.11 (Visual Resources and Aesthetics).

July 3, 2006 letter from Tim Jensen / Monterey Peninsula Regional Park District

Comment LAND-3

As examples: Both 3.2 Proposed Project and 3.3 Alternative 1 do not have adequate project area descriptions, land ownership, or map depicting land ownership and boundaries.

Response

This comment has been addressed in Section 4.13, Land Use, in this Final EIR/EIS. Also refer to Figure 4.13-1, which shows land ownership in the Project Area.

July 3, 2006 letter from Tim Jensen / Monterey Peninsula Regional Park District

Comment LAND-4

The document states that The Park District has previously expressed "tentative support for sediment disposal at Garland Ranch.. .", provides a citation, but does not list The Park District as an agency consulted in Section 6.0 Lists and References. The Park District requests that the document cited be made available to The Park District for review.

Response

The Monterey Peninsula Regional Park District was contacted by the Core Team to invite consultation on several occasions prior to the release of the Draft EIR/EIS. Because no response was received from the Park District until after the Draft EIR/EIS was released, it is not listed in Section 6.0. There have been a number of discussions with the Park District since the release of the Draft EIR/EIS and information from them is included in relevant sections of the Final EIR/EIS, including Sections 4.12, Recreation, and 4.13, Land Use. Regarding the document cited, it is available for review at the CAW offices in Monterey, California. The Park District will be listed as an agency consulted in Section 6.0, Lists and References, in the Final EIR.

July 3, 2006 letter from Tim Jensen / Monterey Peninsula Regional Park District

Comment LAND-5

An aerial photograph and on-the-ground images of pre-project condition and post-project impact are needed to adequately evaluate this project.

Response

Aerial photography and on-ground imagery pre-project conditions and post-project impacts were not considered necessary to document or evaluate impacts in this area. A land use map is contained in the Final EIR/EIS (see Figure 4.13-1 in the Land Use Section 4.13) depicting land ownership in the project area. Please also refer to Section 4.11 for an assessment of Visual Resources, including photographs of pre-project conditions. Responses to comments VIS-3, above, VIS-4 through VIS-6, below, and VIS-1 and 2, located in Appendix E under Visual Impacts, contain additional visual resources information.

NEPA/CEQA COMPLIANCE

WRITTEN COMMENTS RECEIVED

June 4, 2006 letter from Don Redgwick

Comment NEPA/CEQA-1

CEQA proposals should include a cost benefit analysis. I see no environmental benefit to removing the dam except the questionable conclusion that fish ladders don't work. The environmental issues relating to frogs, birds, lake fish, deer, bears, mountain lions etc. appear to be forgotten. The value of the dam as a source of water and a protection from water pollution caused by watershed erosion is being ignored. Lastly the cost of removing the dam and containing the sedimentary material will be more expensive than buttressing it. A buttress would utilize a portion of the sediment and would partially bury the dam on the down stream side up to a spillway level. This would be a cost benefit greater than off- hauling the material and probably less expensive than the rerouting option. I don't know the magnitude to the rerouting proposal, but it could involve a huge dirt moving cost. If the benefit is removing the dam because fish ladders don't work according to some people, I think the other environmental issues should be considered.

Response

CEQA does not require a cost-benefit analysis in the EIR/EIS. An economic or social change by itself shall not be considered a significant effect on the environment unless they lead to physical changes that cause environmental impacts (CEQA Guidelines 15131 and 15382, Public Resources Code 21068). CEQA does allow consideration of economic and other impacts when approving a project (Public Resources Code 21002). Environmental impacts to wildlife are addressed in Section 4.5 of the EIR/EIS. California red-legged frogs are a listed species under the Endangered Species Act (ESA) and are extensively considered in that section. The project does not provide water storage; see response to Comments WAT-3, 6, 7, 8 and 13 and WAT-10, 11, and 12. Water quality effects are addressed in EIR/EIS Section 4.3. Please refer to Chapter 3.1 and Table 3.1-1 of the Final EIR/EIS for a summary of comparative costs for the alternatives considered. The Final EIR/EIS considers and documents a full range of environmental issues; it is not limited to consideration of fish passage alone.

June 13, 2006 letter from John G. Williams, Ph.D.

Comment NEPA/CEQA-2

The by-pass and removal alternatives will not solve passage problems for steelhead. The by-pass alternative is imaginative and may provide a feasible means of restoring more or less natural passage for steelhead past the San Clemente site. However, the benefits of such passage are limited by the presence of Los Padres Dam, which lies between San Clemente and most of the prime habitat in the upper watershed. Historically, Los Padres Dam has been a much larger problem for steelhead than San

Clemente Dam (Williams 1983), so it is not clear that removing San Clemente Dam will provide much benefit to steelhead. Particularly if public money will be needed for these alternatives, as has been suggested by some, then the benefits to steelhead from improving passage at San Clemente should be compared to the benefits to steelhead from improving passage at Los Padres.

Response

The Proponent's Proposed Project and all of the action alternatives meet the project objective to provide fish passage at San Clemente Dam (SCD). Improving fish passage at Los Padres Dam (LPD) is not within the scope of this Final EIR/EIS.

Comment NEPA/CEQA-3

The Old Carmel Dam improvements should be considered separately. It is not clear why improvements to the Old Carmel are part of this project. If these improvements need to be made, they should be made, whether or not anything else is done.

Response

Improvements to the existing access road to the plunge pool from Old Carmel River Dam (OCRD) and upgrading of the OCRD Bridge (OCRB) are needed for the Proponent's Proposed Project and Alternative 1 (Dam Notching). Therefore, they must be considered in the evaluation of each of these alternatives. Improvement to fish passage at OCRD is included in all of the action alternatives.

June 30, 2006 letter from Trish Chapman/California Coastal Conservancy

Comment NEPA/CEQA-4

The EIR/EIS analyzes two alternatives for dam removal – one which involves complete removal of all of the accumulated sediment from the area and one which would re-route the Carmel River to isolate the accumulated sediment. The EIR/EIS should also evaluate the potential for stabilizing the sediment along the banks of the Carmel River and allowing a new conveyance channel to be cut along the original stream thalweg or some other alignment through the reservoir. The approach being used for sediment stabilization on the Elwha Dam Removal project could serve as a model. **(Also AA-19)**

Response

It is not clear from the comment whether the author is proposing consideration of an alternative that would allow unmanaged sediment transport downstream. Such an alternative was considered in the 2000 RDEIR and was rejected due to potential downstream impacts on public safety which would be caused by the flood hazard associated with channel aggredation and because of the predicted impacts to spawning habitat. The concept of stabilizing sediment in place is an element of Alternatives 1 and 3. Under Alternative 1, a geomorphically stable stream channel would need to be reestablished in the sediment remaining after excavation down to the level of the notch

that would be made in the dam at elevation 509 feet. Under Alternative 3, sediment would be stabilized in place on the Carmel River and a geomorphically stable channel would be established in San Clemente Creek.

Comment NEPA/CEQA-5

Upstream fish passage for adults: No matter how well a fish ladder is designed, there is always a subset of the population that will be blocked and almost all of the population will experience some delay.

Response

The effect of the existing fish ladder on fish passage is part of the baseline environmental condition and would not be an impact of the project. The Proponent's Proposed Project and all of the action alternatives propose fish passage elements that would improve conditions compared to the existing baseline.

Comment NEPA/CEQA-6

Downstream fish passage for juveniles: The proponent's proposed project should improve downstream passage at the dam over current conditions, but passage through the sluice or over the dam in spillway will still have an impact.

Response

This impact is considered in the EIR/EIS as part of Impact Issue FI-12 (Section 4.4). The existing impact to fish passing over the Dam is part of the baseline environmental condition and would not be an impact of the project. Improvements to the fish ladder and spillway under the Proponent's Proposed Project would provide a long-term net benefit to fish passage at the dam compared to existing conditions.

Comment NEPA/CEQA-7

Alternative 1, Issue FI-13: Stream Sediment Removal, Storage, and Associated Restoration. The determination states that the impact is significant, unavoidable, and long-term; however, the impact discussion states that the impact is temporary. These two statements are inconsistent.

Response

The determination for Issue FI-13 has been corrected to identify a short-term impact which is significant and unavoidable (see Section 4.4 and revised Table 2.1 in the Final EIR/EIS).

Comment NEPA/CEQA-8

Section 5.5 Relationship between Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity. One of the project purposes stated in Section 1.4 is to "provide fish passage at the dam." Any option that leaves the

dam in place will have impacts on passage of adults, juveniles and kelts that cannot be fully mitigated. As such, the last paragraph of Section 5.5 is understated and incomplete. See comment on Impact FI-9 Upstream Fish Passage for more details.

Response

Each alternative meets the project objective of providing fish passage at San Clemente Dam. The impacts to fish passage caused by the existing Dam are part of the baseline environmental condition and would not be impacts of the Proponent's Proposed Project or any of the alternatives. In the Final EIR/EIS, the final paragraph of Section 5.5 has been expanded to clarify that all of the action alternatives would improve fish passage as compared to the baseline environmental condition, even under the alternatives where the Dam would be retained, and the fish ladder and SOMP would be implemented to provide passage.

June 20, 2006 letter from Mark Delaplaine/California Coastal Commission

Comment NEPA/CEQA-9

Should the proposed project go forward, the Coastal Commission will require that a consistency certification be submitted to the California Coastal Commission for this federally-permitted project, based on its impacts in the coastal zone.[1] *This regulatory requirement arises under Section 307 of the federal Coastal Zone Management Act.*[2] *The consistency certification should include a finding as to whether the activities are consistent with the California Coastal Management Program and the necessary information to support that conclusion, including an analysis of the project's consistency with Chapter 3 of the Coastal Act. (See CFR Section 930.58 for a full listing of the information required for a complete consistency certification.)*

Response

Thank you for your advice concerning the requirements of the Coastal Commission and the Coastal Zone Management Act. The project is located 18 river miles upstream of the mouth of Carmel River. It would not adversely affect any coastal zone resources. Existing conditions may be affecting coastal zone resources, but these are not impacts of the project. The 2000 RDEIR considered sediment management alternatives that would allow natural transport of accumulated sediment downriver and to the coastal zone. This was found to have unacceptable impacts to fish spawning and to public safety (due to the flooding potential associated with riverbed aggredation). In preparing the EIR/EIS, California American Water (CAW) explored the market potential for the accumulated gravel and sediment, and learned that the cost of removing it would exceed its market value. The associated traffic and safety impacts, and cost of excavating and trucking sediment to beaches for nourishment would be similar to those

[1] Unless the USACE itself assumes responsibility for the project, as described further in this response to comments section.
[2] 16 U.S.C. Section 1456, with implementing regulations at 15CFR Part 930.

identified in the 2000 RDEIR for sediment removal via truck; these impacts were considered unacceptable then and those alternatives were eliminated from consideration in this EIR/EIS.

Comment NEPA/CEQA-10

The Draft EIR/EIS should provide information on the quantity and quality of sediment trapped by SCD, identify environmentally advantageous options for delivering to the beach and littoral zone appropriate sediment, and identify environmentally advantageous options for placing sand on the beach or in the nearshore zone.

Response

Sediment trapping at San Clemente Dam is discussed in the Final EIR/EIS Section 4.2, Hydrology and Water Resources. Effects of the existing dam on sediment delivery to the coastal zone are part of the baseline environmental condition. The project would not adversely affect sediment delivery to the coastal zone and beach nourishment is not within the scope of this project. The purpose and need of the action evaluated by this EIR/EIS does not include improving beaches or the nearshore zone. However, note that under all alternatives all, or a substantial portion of, the annual sediment load naturally generated in the watershed will begin passing downstream of the dam site within six to ten years. In addition, a limited amount of gravel injection to the river is discussed under Impact Issue WR-3a in Section 4.2 of the Final EIR/EIS. Please refer to the response to comment NEPA/CEQA-9 for amplification on previous consideration of the cost and impacts of transport of sediment from behind San Clemente Dam.

Comment NEPA/CEQA-11

Further testing of the sediments in the reservoir is needed to determine the volume of reservoir sediment that could be considered acceptable for beach or nearshore nourishment.

Response

Sediment trapped at San Clemente Dam is discussed in the Final EIR/EIS Section 4.2, Hydrology and Water Resources. Beach nourishment is beyond the scope of this EIR/EIS, the purpose and need of the action evaluated by this EIR/EIS does not include improving beaches or the nearshore zone. However, note that under all alternatives, all or a substantial portion of the annual sediment load naturally generated in the watershed will begin passing downstream of the dam site within six to ten years. In addition, a limited amount of gravel injection to the river is discussed under Impact Issue WR-3a in Section 4.2 of the Final EIR/EIS. Please refer to the response to comment NEPA/CEQA-9 for amplification on previous consideration of the cost and impacts of transport of sediment from behind San Clemente Dam.

Comment NEPA/CEQA-12

The proposed action and Alternative 1, dam thickening and dam notching, include sluicing some of the existing and future sediment past the dam into the river flow in an effort to "maintain the existing surface water supply intake in the reservoir, and to ensure fish passage through the accumulated sediment." These plans will not return a substantial portion of the trapped sand to the beach, and what sand there is in these sluiced waters will almost certainly take many years to get to the beach.

Response

Sluicing is proposed as mitigation for fish passage and is not intended to provide beach nourishment. The purpose and need of the action evaluated by this EIR/EIS does not include improving beaches or the nearshore zone. However, note that under all alternatives, all or a substantial portion of the annual sediment load naturally generated in the watershed will begin passing downstream of the dam site within six to ten years. In addition, a limited amount of gravel injection to the river is discussed under Impact Issue WR-3a in Section 4.2 of the Final EIR/EIS. Please refer to the response to comment NEPA/CEQA-9 for amplification on previous consideration of the cost and impacts of transport of sediment from behind San Clemente Dam.

Comment NEPA/CEQA-13

Alternatives 2 and 3, dam removal and dam re-route and removal, both entail locking up the accumulated sediment permanently using two different disposal methods. In either case, the accumulated sand that would have naturally made its way to the beach would be permanently inaccessible to the beach. Sediments in the waters from upstream of the removed dam would take many years to get to the beach, as well

Response

There are no scenarios, short of dam failure, under which the existing accumulated sediment would naturally make its way to coastal beaches. Under the No Project (No Action) alternative, the existing dam would remain in place, as would the sediment accumulated behind it. The purpose and need of the action evaluated by this EIR/EIS does not include improving beaches or the nearshore zone. However, note that under all alternatives, all or a substantial portion of the annual sediment load naturally generated in the watershed will begin passing downstream of the dam site within six to ten years. In addition, a limited amount of gravel injection to the river is discussed under Impact Issue WR-3a in Section 4.2 of the Final EIR/EIS. Please refer to the response to comment NEPA/CEQA-9 for amplification on previous consideration of the cost and impacts of transport of sediment from behind San Clemente Dam.

Comment NEPA/CEQA-14

Neither the proposed action, nor any of the alternatives, includes a plan for delivering any amount of the sand and gravel currently trapped behind the dam to the beach. The Draft EIR/EIS should include information on changes to downstream morphology from

the proposed plan and alternatives, a plan for allowing delivery of some of the accumulated sand to the beach, in a manner that would best benefit the entire riverine system, and in particular, the portion of the river located in the coastal zone. In addition, the Draft EIR/EIS should propose options for environmentally advantageous placement or use of beach compatible sediments for beach nourishment.

Response

The purpose and need of the action evaluated by this EIR/EIS does not include improving beaches or the nearshore zone. Please refer to the response to comment NEPA/CEQA-9 for amplification on previous consideration of the cost and impacts of transport of sediment from behind San Clemente Dam.

Comment NEPA/CEQA-15

The Draft EIR/EIS shows that any method of slowly releasing the accumulated sediment into the river in an effort to mimic natural processes would greatly decrease water quality, to the point of endangering the steelhead fishery. It would appear that this option has not been fully explored.

Response

The EIR/EIS does not address any method of slowly releasing the accumulated sediment into the river in an effort to mimic natural processes. As described in Section 3.1, a previous EIR (RDEIR, 2000) on the project evaluated an alternative that would have released sediment over a 60 to 100 year period. This alternative was considered and eliminated due to its long-term effects on fish and water quality, due to its potential effects on flooding, and because the ability to control releases was not demonstrated.

Comment NEPA/CEQA-16

Further, the Draft EIR/EIS should include an alternative that shows the feasibility of off-stream water storage, in order to maximize flows during the low-flow periods that are most detrimental to the steelhead, as described by NMFS.[3]

Response

The purpose and need of the action evaluated by this EIR/EIS does not include water storage or improving flows for fish. The impacts to river flows caused by the existing dam are part of the baseline environmental condition and improving those conditions are beyond the scope of this project.

Comment NEPA/CEQA-17

The Commission staff would like to see in the Draft EIR/EIS an alternative that includes and explores the following NMFS recommendations: Probably the greatest single opportunity for substantially mitigating these impacts would be for Cal-Am to: 1)

[3] "Instream Flow Needs for the Carmel River," pg. 29, June 3, 2002, NMFS, Southwest Region.

increase its diversions during seasonal (winter) high flows, 2) adhere to the minimum bypass flows and cumulative diversion rate recommendations, 3) store the diverted winter waters off stream (either Aquifer storage or ponds) for use during periods of low flow, and 4) make concomitant reductions in its unlawful diversions from the Carmel River. With these actions, Cal-Am would greatly reduce its diversions during low flow periods, while offsetting those reductions with additional diversions during the high flows of winter.[4]

Response

The NMFS' recommendations concern improving existing conditions. Existing conditions are part of the environmental baseline for this project. The purpose and need of the action evaluated by this EIR/EIS do not include improving fish flows and alternatives to improve flows are beyond the scope of this project. The impacts to river flows caused by the existing dam are part of the baseline environmental condition and are not impacts of the Proponent's Proposed Project or any of the project alternatives.

June 29, 2006 letter from David A. Berger / Monterey Peninsula Water Management District (MPRPD)

Comment NEPA/CEQA-18

The alders that established a well vegetated canopy around the existing San Clemente Reservoir were killed as a result of the Interim Drawdown Project, beginning 2003. The FEIR/S should include mitigation measures to revegetate the margin of the remaining reservoir area as part of Proposed Project, Notching Project, and Rerouting Alternative.

Response

The interim drawdown does not currently require mitigation to revegetate the riparian zone surrounding the reservoir. The effects of the interim drawdown are part of the baseline environmental condition. They are not impacts of the Proponent's Proposed Project or its alternatives that would require mitigation.

Comment NEPA/CEQA-19

The FEIR/S should fully review the need for moving the diversion point upstream 6,000 feet and should describe potential impacts on habitat at the point of diversion and in the reach(s) affected by diversion. Alternatives to moving the diversion should be fully evaluated. These comments apply to other alternatives, including the No Project **(Also WAT-3)**

Response

The purpose and need of the action that the EIR/EIS evaluates include maintaining a CAW point of diversion on the Carmel River. Therefore, all alternatives that remove the dam require that the point of diversion it provides on the Carmel River be replaced. To

[4] "Instream Flow Needs for the Carmel River," pg. 29, June 3, 2002, NMFS, Southwest Region.

maintain the head provided at the existing point of diversion (the Dam), it would be necessary to relocate the diversion point approximately 6,000 feet upstream. This feature is common to all dam removal alternatives. Evaluation of the effects of relocating the diversion upstream can be found in Sections 4.2 and 4.4 of the Final EIR/EIS. Any change in CAW's point of diversion will require approval of the State Water Resources Control Board, which has an established review process.

Comment NEPA/CEQA-20

Chapter 5, Section 5.3.3, page 5-12, Seaside Basin Injection/Recovery Project: The text incorrectly states in line 9 that: "The environmental effects of this project have not been analyzed; however, analysis conducted for the 2000 RDEIR concluded that the well and pipeline portion of the project would have relatively minor construction impacts [continues]"

Instead, the text should say:

The environmental effects of Phase 1 of the MPWMD Aquifer Storage and Recovery (ASR) Project have been analyzed in a Draft EIR/EA released in March 2006; a Final EIR/EA is anticipated to be certified by the MPWMD Board in August 2006. The Phase 1 project entails a second injection well at the MPWMD's existing Santa Margarita Test Injection well site on the former Fort Ord, using existing CAW facilities, with the exception of a new CAW temporary pipeline that is planned for construction in Fall 2006. Subsequent phases would be the subject of separate future environmental review, and depend on the progress of other regional water supply projects described in this chapter. The DEIR/EA concluded that the well and pipeline portion of the project would have relatively minor construction impacts; operation of the project would have beneficial effects on the Carmel River hydrology and dependent fish and wildlife. [Note: All remaining existing text starting with "however, analysis conducted for the 2000 RDEIR concluded that ." should be deleted].

Response

Thank you for this update. This is not considered to change the outcome of the cumulative effects analysis. The discussion in Chapter 5.3.3 has been modified.

Comment NEPA/CEQA-21

Chapter 5, Section 5.3.3, page 5-13, MPWMD Sand City Desalination Plant. The following text should be added to the end of the existing paragraph:

An administrative draft EIR was prepared by MPWMD and reviewed by its Board in December 2003. At that time, completion of a public Draft EIR was delayed until additional studies on seawater intake and brine discharge technology could be completed. In March 2004, the MPWMD Board determined that it would not pursue the desalination project, pending review of regional desalination projects in Moss Landing

that had been proposed. As of June 2006, MPWMD has updated cost information for the desalination project, but is not actively pursuing the project.

Response

Thank you for this update. This is not considered to change the outcome of the cumulative effects analysis. The discussion in Chapter 5.3.3 has been modified.

June 30, 2006 comments from National Marine Fisheries Service (NMFS)

Comment NEPA/CEQA-22

One of CEQA's main objectives is to require agencies to avoid or reduce the environmental effects by implementing feasible alternatives or mitigation measures. One of the purposes of the ESA is to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved. The Carmel River steelhead run is critical to the recovery of the S-CCC DPS. A proposed project alternative that results in the perpetual adverse modification of designated critical habitat, as well as perpetual take of listed species is inconsistent with CEQA, as well as the ESA and the recovery needs of the S-CCC DPS.

Response

From its context, this comment appears to address the operation of sluice gates as part of the Proponent's Proposed Project and Alternative 1 (Dam Notching). Sluice gate operations are described in the Sediment Operation and Management Plan (Appendix J). An environmental assessment of sluicing operations and management is provided throughout Chapter 4 of the EIR/EIS.

CEQA requires that, for each significant impact, mitigation measures must be identified and discussed, including any significant side effects of implementing a mitigation measure (CEQA Guidelines 15126). Agencies may not approve projects with significant environmental effects if there are feasible alternatives or mitigation measures that can "substantially lessen" or avoid them (Public Resources Code 21002). Where a decision allows significant effects to occur which are not mitigated to a level that is not significant, it must provide a written statement of "overriding considerations", which gives its reasons to support its decision to allow the effects to occur (Public Resources Code 21002, CEQA Guidelines 15093). This statement must be included in the record of project approval and must be mentioned in the Notice of Determination. This EIR/EIS and the CEQA process that is being followed to its certification are consistent with these requirements of CEQA.

Comment NEPA/CEQA-23

NMFS participated in the detailed sediment transport analysis conducted after the August 2000 Draft EIR/EIS was submitted. That Draft EIR/EIS also proposed dam strengthening and sluice gates. NMFS' significant commitment during those sediment

transport studies was primarily to ensure dam removal was given adequate examination. NMFS was also establishing a systematic methodology for future analysis regarding the San Clemente Dam. NMFS expects that level of analysis for the proposed sluicing operations, but the Draft EIR/EIS does not include those results.

The results of a defendable systematic analysis would include suspended sediment concentrations from the dam to the ocean for a full range of hydrologic conditions. Suspended sediment in the water column, as well as habitat alteration, would be addressed. The Draft EIR/EIS has taken an unacceptable short cut in analyzing a project that proposes to adversely effect – in perpetuity – the most essential steelhead run in the S-CCC DPS. **(Also SED-42)**

Response

A detailed analysis of sediment transport is presented in Section 4.2 of the Final EIR/EIS and in Appendix J (revised SOMP), Appendix M (Sediment Transport Modeling), Appendix N (Summary of Hydraulic and Sediment-transport Analysis of Residual Sediment), and Appendix S (Additional Modeling to Evaluate Sediment Sluicing Options and Compare Downstream Sediment Concentrations for EIR/EIS Alternatives) which are referenced in this section. The effects of sediment on fish are analyzed in Section 4.4. The discussion in each of these sections has been expanded in the Final EIR/EIS to provide a more detailed analysis. It is not clear what is meant by the "unacceptable short cut."

Comment NEPA/CEQA-24

Work windows are discussed throughout Section 3.0. For instance, page 3-36, 3.2.7 Construction Schedule and Operations states field work in the reservoir area would start on or about April 15th. NMFS and the California Department of Fish and Game have determined the appropriate work windows for instream work for each Alternative (email from NMFS, dated 22 February 2006). For the Proponent's Proposed Project, the work window is June 15 – October 15. Alternative 1: June 15 – October 15; Alternative 2: June 1 – October 31; and Alternative 3: June 1 – October 31. Please adjust the work windows for all projects accordingly.

Response

Thank you for this guidance. The determination of work windows is expected to be decided in permitting the selected alternative, as directed by NMFS and the California Department of Fish and Game (CDFG).

April 5, 2006 letter from Dick Butler/NOAA's NMFS

Comment NEPA/CEQA-25

There are many instances throughout the draft EIR/EIS where the alternatives are compared to the baseline conditions rather than the No Action Alternative (Alternative 4). In a NEPA document, the analysis must compare the effects of an action versus the

No Action Alternative. The effects determinations are inconsistent or incorrect, which creates the impression that the Proponent's Preferred Project is beneficial.

Response

CEQA requires a comparison of all alternatives to the baseline (CEQA Guidelines Section 15125(a). The National Environmental Protection Act (NEPA) standard for alternatives analysis has been applied in this Final EIR/EIS, as being more stringent than the CEQA standard. NEPA requires that alternatives be compared to one another, and evaluated against environmental baseline conditions. The No Project (No Action) Alternative comprises the current and projected future environmental baseline, in the absence of the proposed project (action). It includes a new fish ladder and modifications and the OCRD. Table 2.1 summarizes the comparison of alternatives with one another. The environmental evaluation of all alternatives is done against an extended baseline (to the year 2025) as described in Chapter 4 (page 4.2). It is consistent and correct to describe environmental effects in relation to the environmental baseline.

July 3, 2006 letter from Robert W. Floerke / Department of Fish and Game

Comment NEPA/CEQA-26

DFG consultation history: Staff from the Central Coast Region of DFG have for many years provided CAW and DWR with input on various aspects of the management of aquatic resources in the Carmel River watershed. A primary concern has always been the viability of the Carmel River population of the steelhead trout, Oncorhynchus mykiss, which is in the South-Central California Coast (SCCC) Evolutionarily Significant Unit, designated by the National Marine Fisheries Services as Threatened. The steelhead is also a State Species of Special Concern. The California red-legged frog is another State Species of Special Concern, and is listed by the U.S. Fish and Wildlife Service as Threatened. DFGLs concerns as a trustee agency for these and other riparian species in the Carmel River watershed have been largely focused on ensuring adequate instream flows and passage conditions in relation to CAW'S water supply operations in Carmel Valley. This has included an ongoing need to ensure compliance with fish passage necessary over the Dam, by adequate maintenance and improvements of the existing fish ladder, as well as ensuring bypass flows and moderating drawdown regimens at the reservoir. We also provided input on earlier versions of the Draft EIR, prior to the inception of Alternative 3, which has evolved as a middle option between full dam removal and strengthening. In previous years DFG participated in "core group" meetings that dealt specifically with the DSOD order, DFG participation ceased due to staffing limitations. In December 2005, DWR requested DFG re-engagement in the process by reviewing the administrative draft of the DEIRIEIS. In response, DFG staff were redirected towards this effort and provided initial input to DWR, much of which will be repeated in this letter. However, DFG was not subsequently allowed to resume its participation in the core group process.

Response

CDFG comments on the Administrative Draft EIR/EIS were received on March 20, 2006, approximately 50 days after the deadline and a few days before the Draft EIR/EIS was scheduled to be sent to the printer. These comments have been incorporated as much as possible within the time available.

The EIR/EIS core team had an established policy of inviting California responsible agencies to meetings concerning issues where the core team felt it needed their expertise or experience. The core team did not receive a formal request from CDFG to participate and was winding up its meeting schedule by the time CDFG personnel began to informally express interest in attending. As a core team member, the Department of Water Resources (DWR) attempted, but was not successful, in scheduling a special meeting with CDFG during the Draft EIR/EIS comment period. CDFG has been involved in discussion on sluicing and its impacts since the Draft EIR/EIS was issued in April 2006.

Comment NEPA/CEQA-27

Project baseline: The current condition of the watershed, with the Dam and fish ladder present, is arguably the existing baseline as defined in CEQA. An improved ladder cannot possibly be viewed as a potentially adverse effect from a biological perspective. The obvious effect of the Dam on downstream channel morphology, by retaining sediment which leads to channel instability, incision and bank erosion, lack of spawnable gravel below the Dam and possible lack of sediment into the Carmel Lagoon, should be considered as part of the CEQA baseline.

Response

It is correct, as stated, that the current condition of the watershed, with SCD and the existing fish ladder in place, represent the CEQA baseline. The improved ladder is considered a beneficial impact under the Proponent's Proposed Project and Alternatives 1, 2, and 3. Sediment passage would occur under the Proponent's Proposed Project and under any of the alternatives, ameliorating historical baseline effects on downstream sediment.

Comment NEPA/CEQA-28

In the SAA process, the sluicing plan would have to be fully developed and mitigated before a SAA could be executed. Until the sluicing impacts are more thoroughly quantified, we cannot provide the range of mitigations that would be sufficient; this will need to be done through the SAA process. In contrast, the impacts of dam removal options are more quantifiable and would require less extensive mitigations. **(Also FI-29, SED-14)**

Response

Thank you for this guidance. It will be considered during project permitting. The Updated SOMP is included as Appendix J and discussed throughout Chapter 4 of this Final EIR/EIS.

Comment NEPA/CEQA-29

The strengthening of the dam within the watershed will require the regulatory agencies to perpetually exert a heightened level of oversight to the dam than what would be necessary if Alternatives 2 or 3 are ultimately selected. All four alternatives will entail impacts to the river during construction or implementation, but the impacts from the sluicing regimen and passage impediment initiated and maintained by the preferred project will continue in perpetuity. Because of this difference in the scope of impacts, DFG will be forced to modulate the impacts for the proposed project over a greater period of time. If there is no ultimate large benefit from the project, we would seek to minimize the temporal impacts to the river corridor and would likely restrict work within the river zone to periods that will most likely be between June 15 and October 15. This may be further restricted by high spring flows or early rains. In contrast, if the net effect of the project is beneficial, i.e. dam removal, it would provide a rationale for an accelerated schedule, with a possibly higher short-term risk to resources that is mitigated by an earlier capture of a significant resource benefit. This could allow completion of a dam removal option in a shorter time frame than the preferred alternative.

Response

Thank you for this guidance. It is not clear what is meant by “DFG will be forced to modulate the impacts for the proposed project over a greater period of time.” The determination of work windows is expected to be decided in permitting the selected alternative, as directed by NMFS and CDFG.

Comment NEPA/CEQA-30

Please be advised this project will result in changes to fish and wildlife resources as described in the California Code of Regulations, Title 14, Section 753.5(d)(l)(A)-(G). An environmental filing fee as required under Fish and Game Code Section 71 14d) should be paid to the Monterey County Clerk on or before filing of the Notice of Determination for this project.

Response

As legally required, since the Lead Agency is a state agency, the fee will be paid at the State Clearinghouse when the Notice of Determination (NOD) is filed.

NOTE: COMMENT NEPA/CEQA 31 WAS RECEIVED AT MAY 23, 2006 PUBLIC HEARING

Comment NEPA/CEQA-31

Roger Williams/Resident of Carmel-by-the-Sea

The issue is dams over the years in California have trapped sediment, which has had a negative impact on beaches. Many of the beaches up and down the state are diminishing. So I think if the bypass route is used, rather than entombing the sediment forever, a slow impact, as the previous speaker was talking about, over a hundred years of releasing some of that trapped sediment every year during the winter state would help reestablish some of the beaches. **(Also SED-62)**

Response

The purpose and need of the action that this Final EIR/EIS evaluates does not include improving beaches or the nearshore zone. Note that under all alternatives, all or a substantial portion of the annual sediment load naturally generated in the watershed will soon begin passing the dam site. In addition, a limited amount of gravel injection to the river could be implemented and is discussed briefly under Impact Issue WR-3a (Section 4.2).

June 29, 2006 letter from Duane James/U.S. Environmental Protection Agency

Comment NEPA/CEQA-32

Based on our review, we have rated the document as Environmental Concerns - Insufficient Information (EC-2) (see enclosed "Summary of Rating Definitions"). We have some concerns with the proposed retrofit plan and request that additional clarifications be made in the FEIS regarding the long-term impacts and benefits associated with the alternatives. EPA recommends that the FEIS include additional information related to the Clean Water Act (CWA) Section 404(b)(l) process and the short and long-term economic and environmental costs and benefits of each alternative. In particular, the FEIS should include an analysis of the projected long-term benefits to the River and the steelhead population from the removal of the dam.

Response

Additional information related to the Clean Water Act (CWA) Section 404(b)(1) process and the Least Environmentally Damaging Practicable Alternative (LEDPA) is included in Table 1-1 and Section 1.5.1 of the Final EIR/EIS. Evaluation of this proposed activity's impacts in the USACE Record of Decision (ROD) will include application of the guidelines promulgated by the Administrator of the U.S. Environmental Protection Agency under Section 404(b)(1) of the CWA (33 U.S.C. Section 1344(b)). Fundamental to CWA guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem unless it can be demonstrated that such discharge will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern. No

discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge that would have less adverse impact on the aquatic ecosystem. An alternative is considered practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purposes.

Analysis of short- and long-term economic and environmental costs and benefits under CWA 404(b)(1) is expected to be completed during the first half of 2008. This analysis will include projected long-term benefits to the river and the steelhead population from the removal of the Dam. In the Final EIR/EIS, benefits of dam removal are presented in Tables 4.4-10 and 4.4-11 and discussed in Chapter 4.4 under Impact Issues FI-8, FI-9a, FI-9b, FI-12, and FI-13 for Alternatives 2 and 3.

Comment NEPA/CEQA-33

All project alternatives will have impacts to Waters of the U.S. and wetlands and will need a Clean Water Act (CWA), Section 404(b)(l) permit. The CWA, Section 404(b)(l) Guidelines (40 CFR 230.10(a)) require the selection of the Least Environmentally Damaging Practicable Alternative (LEDPA). This determination must take into account effects to all resources.

Recommendation: The FEIS should include a summary of the CWA, Section 404(b)(I) permitting process and ensure that the LEDPA will be selected in the Record of Decision (ROD).

Response

The requirement to obtain the Section 404 permit is summarized in Chapter 1 of this Final EIR/EIS, Table 1-1. Response to Comment NEPA/CEQA-32 above explains the timing of the 404 permit (there is no 404(b)(1) permit). The LEDPA will be identified and selected in the ROD.

June 28, 2006 letter from Jim Crenshaw/California Sportfishing Protection Alliance

Comment NEPA/CEQA-34

The Final EIR/EIS should also identify Alternative 3 as the Least Damaging Project Alternative. Alternative 3 removes the barrier to fish passage, maintains red legged frog habitat, and prevents uncontrolled release of accumulated sediment downstream.

Both the Proponent's Proposed Project and the notching alternative would continue to have adverse impacts on fish passage. In addition the sluicing required for both of those alternatives would interfere with use of the fish ladder. Furthermore, both the PPP and the notching alternatives would lead to uncontrolled releases of accumulated sediments in high flow events. Therefore neither of these qualifies as the Least Environmentally Damaging Project Alternative.

Response

The LEDPA cannot be identified in Final EIR/EIS because permitting under CWA 404(b)(1) has not been completed. The CWA 404 permit is expected to be completed during the first half of 2008.

Carmel River Steelhead Association Comments on San Clemente Environmental Impact Report

Comment NEPA/CEQA-35

The impact report determined that all options had the same basic impact. We believe that this is not so and that leaving the dam in place has multiple impacts that would hinder recovery and lead to extinction over time.

Response

This Final EIR/EIS documents differences in impacts among the alternatives. Table 2-1 summarizes the comparative impacts of the Proponent's Proposed Project and analyzed alternatives. The alternatives would allow for dam removal would have benefits that are not realized by the alternatives which leave it in place, but the dam removal alternatives would also pose impacts that the other alternatives do not. The existence of the Dam is not an impact of the project, but a part of the environmental baseline conditions for the EIR/EIS analysis.

June 28, 2006 letter from Bob Baiocchi/Carmel River Steelhead Association

Comment NEPA/CEQA-36

The EIR/EIS is deficient because the document failed to disclose, evaluate, and include the removal of the San Clemente Dam as a reasonable alternative that would be in the public interest and reopen the navigability of the river for fish and boating.

Response

Alternatives 2 and 3 would remove SCD.

Comment NEPA/CEQA-37

CEQA requires mitigation measures that would prevent the dam from obstructing the downstream recruitment of spawning habitat. CEQA does not allow for trade offs.

Response

The existence of the Dam is not an impact of the project, but a part of the environmental baseline conditions for EIR/EIS analysis. CEQA does not require mitigation of existing conditions.

Comment NEPA/CEQA-38

Removal of the San Clemente Dam would prevent the obstruction of the downstream recruitment of spawning gravel for federally protected steelhead trout that would allow steelhead trout to spawn in the lower Camel River. However that reasonable alternative was not disclosed and included in the draft EIR/EIS as an alternative because the draft EIR/EIS placed Cal-American Water Company finances above the protection of the people's public trust steelhead resources. That solution may be applicable with NEPA, but CEQA requires the protection of the steelhead with no tradeoffs. We reference the provisions of the California Environmental Quality Act and its Guidelines.

Response

Alternatives 2 and 3 would remove SCD.

Comment NEPA/CEQA-39

The draft EIR/EIS under CEQA must include a Cumulative Impacts Analysis that discloses, evaluates, and mitigates all of the cumulative effects to federally protected Steelhead Trout and their habitat in the Camel River resulting from the San Clemente Dam and all other diversions by Cal-American Water Company.

The draft EIR/EIS does not include a cumulative impacts analysis of the cumulative effects to federally protected steelhead trout and their habitat in the Camel River Watershed resulting from Cal-American's diversions of the state's waters of the Carmel River Watershed (Surface diversions and underflow diversions).

"A draft EIR must discuss "cumulative impacts" when they are significant. And even when they are not deemed significant, document should explain the basis for that conclusion. (Citizens to Preserve the Ojai v. County of Ventura (2d Dist. 1985) 176 Cal.App.3d 421,432 [222 cal.Rptr. 247].)"

""Cumulative Impacts" are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." "Individual effects may be changes resulting from a single project or a number of separate project." "The cumulative impacts from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonable foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period if time." See CEQA Guidelines. NEPA sometimes equate "cumulative effects" with "synergistic effects." (City of Tenakee Springs v. Clough (9" Cir. 1990) 915 F.2d 1308, 1312; Sierra Club v. Penfold (9th Cir. 1988) 857 F.2d 1307, 1320- 1321; and Natural Resources Defense Council v. Administrator (D.D.C. 1978) 45 1 F.Supp. 1245, 1258.)"

"A legally adequate "cumulative impact analysis" thus is an analysis of a particular project viewed over time and in conjunction with other related past, present, and

reasonably foreseeable probable future projects whose impacts might compound or interrelate with those of the project at hand. Such an analysis "assesses cumulative damage as a whole greater than the sum of its parts." (Environmental Protection Information Center v. Johnson (1st Dist. 1985) 170 Cal.App.3d 604, 625 {216 Cal.Rptr. 502].) "Such an analysis is necessary because '" [t]he full environmental impact of a proposed action cannot be gauged in a vacuum. (Whitman v. Board of Supervisors (2d Dist. 1979) 88 Cal.App.3d 397,408 [IS] Cal. Rptr. 8661, quoting Akers v. Resor (W.D. Tenn. 1978) 443 F.Supp. 1355, 1360.) ' [A]n agency may not..[treat] (sic) a project as an isolated 'single shot' venture in the face of persuasive evidence that it is but one of several substantially similar operations.. .To ignore the prospective cumulative harm under such circumstances could be to risk ecological disaster.'" (Whitman, supra, 8 8 Cal.App.3d at 408 [15] Cal. Rptr. 866], quoting Natural Resources Defense Council v. Callaway (2d Cir. 1975) 524 F.2d 79, 88.)"

"Unless cumulative impacts are analyzed, agencies tend to commit resources to a course of action before understanding its long-term impacts. Thus, a proper cumulative analysis must be prepared "before a project gains irreversible momentum." (City of Antioch v. City Council (1st Dist 1 986) 187 Cal.App.3d 1325, 1333 [232 Cal. Rptr. 507], citing Bozung v. Local Agency Formation Commission (1975) 13 Cal.3d 263,282 [l18 Cal. Rptr. 249].)"

"One court has described as follows the danger of approving projects without first preparing adequate cumulative impact analyses:"

" The purpose of this requirement is obvious: consideration of the effects of a project or projects as if no others existed would encourage the piecemeal approval of several projects that, taken together, could overwhelm infrastructure and viral community services. This would effectively defeat CEQA's mandate to review the actual effects of the projects upon the environment. (Las Virgenes Homeowners Federation, Inc. v. County of Los Angeles (2d Dist. 1986) 177 Cal.App.3d 300, 306 [233 Cal Rptr. 761l].)."

"[I]t is vitally important that an EIR avoid minimizing the cumulative impacts. Rather, it must reflect a conscientious effect to provide public agencies and the general public with adequate and relevant detailed information about them. A cumulative impact analysis, which understates information concerning the severity and significance of cumulative impacts impedes meaningful public discussion and skews the decision maker's perspective concerning the environmental consequences of a project, the necessity for mitigation measures, and the appropriateness of project approval. An inadequate cumulative impact analysis does not demonstrate to an apprehensive citizenry that the governmental consequences of its action. (1 76 Cal.App.3d at 43 1 [222 Cal. Rptr. 2471, quoting San Franciscans for Reasonable Growth v. City and County of San Francisco ("SFRG 1 ") (1st' Dist. 1984) 151 Cal.App.3d 61, 79 [198 Cal Rptr. 634].)"

The Carmel River Steelhead Association requests the Department of Water Resources to follow the law under CEQA and prepare a Cumulative Impact Analysis and include that cumulative impact analysis in the final EIR/EIS.

Response

Section 5.3 of the EIR/EIS contains a cumulative impact analysis prepared in compliance with the requirements of CEQA and NEPA. Cumulative impacts to steelhead trout are discussed in Section 5.3.4.

June 30, 2006 letter from Mindy McIntyre/Planning and Conservation League Foundation

Comment NEPA/CEQA-40

The DEIR/S states, "The need for the San Clemente Dam Seismic Safety Project is to increase dam safety to meet current standards for withstanding a Maximum Credible Earthquake (MCE) and passing the Probable Maximum Flood (PMF) at the dam" 1 -2). This statement indicates that the paramount objective is to protect human safety, which rerouting the river and removal of the dam accomplishes the best.

Response

The Proponent's Proposed Project and all of the alternatives, except Alternative 4 (No Project/No Action), would meet the purpose and need of the project.

Comment NEPA/CEQA-41

However, it is also very important, under CEQA, that the environment not be irrevocably harmed. Rerouting the river and removing the dam is the Least Environmentally Damaging Preferred Alternative (LEDPA). It will go a long way to restoring the watershed that once existed in the Carmel River Valley, as well as protecting the two species currently covered under the Endangered Species Act, the California red-legged frog and steelhead trout.

Response

The LEDPA cannot be identified in Final EIR/EIS because permitting under Clean Water Act Section 404 has not been completed.

NOISE

WRITTEN COMMENTS RECEIVED

June 9, 2006 letter from Victoria Kennedy/Sleepy Hollow Homeowners Association

Comment NOI-1

Notwithstanding my comments about the Project, the Sleepy Hollow Homeowners' Association is very concerned about the comment made during the hearing that San Clemente Road, the road through Sleepy Hollow, would be used for deliveries and access for construction workers. This type of road use would cause severe negative impacts to our residents through dust, noise, and safety concerns for our children and families that utilize the roadway for residential transportation and recreate on and near the roadway. Many of our homes are situated directly adjacent to the roadway and would incur increased levels of the negative health, quality of life, and safety issues stated above. Please note that this is a gated community and the level of use of the roadway is minimal and the residents are accustomed to this lack of traffic. The type of use contemplated is in violation of our agreement with the dam owner, California American Water Company, regarding their use of the road.

Response

Potential roadway effects, and the associated mitigations, are addressed in sections 4.7 (Air Quality), 4.8 (Noise), and 4.9 (Traffic and Circulation) of the Final EIR/EIS.

Comment NOI-2

What are the actual activities or measures to control dust and noise?

Response

There are several planned noise mitigation measures that address the generation and abatement of noise during the construction phase of the Proponent's Proposed Project. Please refer to EIR/EIS Section 4.8.3, Issues NO-2 and NO-4 for a description of noise mitigation measures. Measures to control dust are discussed in Section 4.7 Air Quality.

COMMENTS RECEIVED AT MAY 23, 2006 PUBLIC HEARING

Larry Horan/Upper Carmel Valley landowner

Comment NOI-3

(Comment recorded by the consultant after the close of oral testimony and therefore not in the stenographic record): A group of private landowners originally owned the Stone Cabin and the surrounding 1600 acres of land. They donated 1000 acres of the land to the Park District (possibly including the proposed sediment disposal Site 4R), and continue to own the cabin as a remote recreational refuge. The jeep trail that is proposed to be improved for the alternatives that need access above the dam from Cachagua Road was developed to serve (and still serves) the Stone Cabin. The Stone

Cabin remains in current use by the group. The current use as a serene, remote wilderness getaway is considered to be incompatible with the improvement of the road and its use to transport heavy equipment and materials for Alternatives 1, 2, and 3.

Response

Please refer to Section 4.8.3 Impact Issue NO-5 for an analysis of potential noise impacts associated with use of the Jeep Trail. According analysis of noise impacts, the estimated complex terrain attenuated value is less than the estimated background value at the Stone Cabin and therefore it is unlikely that there would be a significant impact on ambient noise from use of the Jeep Trail or the sediment disposal site at the Stone Cabin during day time hours. Construction activities would occur during daytime working hours. However, given the sparsely populated rural nature of the area, it cannot be determined with certainty that the impact will be less than significant. The impact would be localized in the Project Area but the resultant noise levels, at some times, and at some locations, may be above the normally acceptable range and/or more than 5 dBA above background. These would be considered significant and unavoidable; however these instances would be transient and temporary.

Comment NOI-4

The preferred batch plant site should be a location that does not cause visual, dust, and noise impacts to any Sleepy Hollow subdivision residents and/or be closer to the dam. What were the limitations to locating the batch plant closer to the dam? **(Also AQ-14, VIS-1, TE-29, AA-13 and 14)**

Response

The concrete batch plant is a component of the Proponent's Proposed Project, which includes a number of elements necessary to the project. Please refer to EIR/EIS Section 3.2 for information on the batch plant. The batch plant requires a level area approximately 5 acres (about 218,000 square feet) in size with good road access in order to move in/out the larger pieces of batch plant equipment and aggregate materials. This limits possible sites for the batch plant to generally near Carmel Valley Road, and not up the canyon closer to the Dam due to mountainous terrain and narrow, winding access roads. There is a smaller site closer to the Dam, but it would not be large enough for large trucks to turn around. Thus, it is not technically feasible to locate the batch plant closer to the Dam. Also, the proximity of electric power lines may avoid the use of diesel generators for batch plant operation, thus avoiding emissions of NO_X, CO, ROC, SO_2 , and diesel fine particulate (PM_{10}).

RECREATION

COMMENT RECEIVED AT MAY 23, 2006 PUBLIC HEARING

Comment REC-1

Larry Horan/Upper Carmel Valley landowner

(Comment recorded by the consultant after the close of oral testimony and therefore not in the stenographic record): A group of private landowners originally owned the Stone Cabin and the surrounding 1600 acres of land. They donated 1000 acres of the land to the Park District (possibly including the proposed sediment disposal Site 4R), and continue to own the cabin as a remote recreational refuge. The jeep trail that is proposed to be improved for the alternatives that need access above the dam from Cachagua Road was developed to serve (and still serves) the Stone Cabin. The Stone Cabin remains in current use by the group. The current use as a serene, remote wilderness getaway is considered to be incompatible with the improvement of the road and its use to transport heavy equipment and materials for Alternatives 1, 2, and 3. **(Also NOI-3)**

Response

The project has been redesigned so that access to the Stone Cabin would not be obstructed. None of the alternatives would reroute the Carmel River in the area near the Stone Cabin. Potential impacts relating to the Stone Cabin or its users are discussed in Sections 4.12 (Recreation) and 4.13 (Land Use) of this Final EIR/EIS.

WRITTEN COMMENTS RECEIVED

June 27, 2006 letter from Horan, Lloyd, Karachale, Dyer, Schwart, Law and Cook

Comment REC-2

Any of the alternatives explored in the draft EIS/EIR which would utilize the access road to the property from Cachagua Road to the area of the San Clemente Dam, any rerouting of the Carmel River in that area, or any deposition of any of the silt accumulated behind San Clemente Dam would create a situation in which the use of our remaining property and the historic Murphy stone cabin, the use of the Park District's property for scenic and park purposes, or the maintenance of the terms of the scenic conservation easement imposed by us some 36 years ago would be vitiated. **(Also LAND-2)**

Response

The project has been redesigned so that access to the Stone Cabin would not be obstructed. None of the alternatives would reroute the Carmel River in the area near Stone Cabin. Potential impacts relating to the users of Stone Cabin are discussed in Sections 4.12 (Recreation) and 4.13 (Land Use) in this Final EIR/EIS. Impacts to the

Stone Cabin and its users are also discussed in Sections 4.7 (Air Quality), 4.8 (Noise), 4.9 (Traffic and Circulation) and 4.11 (Visual Resources and Aesthetics).

July 3, 2006 letter from Tim Jensen / Monterey Peninsula Regional Park District (MPRPD)

Comment REC-3

Figure 3.3.4: This map exhibit does not show property boundaries nor does it adequately describe the impact of 1.5M CY of sediment disposal into a public open space park.

Response

This comment has been addressed in Section 4.12, Recreation, in this Final EIR/EIS. Also refer to Figure 4.12-3 in the recreation resources section, which shows a land ownership map of the project area. Section 4.12 also includes a description of recreation impacts associated with sediment disposal on MPRPD-owned land.

Comment REC-4

1. *Pre-project and post-project enhanced photographic imagery depicting what the current and future park boundaries will look like are essential for adequate environmental assessment;*

   (a) *Currently, the park has an extended and publicly accessible riverfront to perennial pools and flowing water. What will any new boundary along the park's riverfront look like and how accessible will the new riverfront be to the public?*

   (b) *What will replace the current riparian vegetation along the park's riverfront boundary if the river course or water levels are changed?*

   (c) *How will public access be affected and/or maintained if river-frontage is changed?* **(Also VIS-7)**

Response

This comment has been addressed in Section 4.12, Recreation, of the Final EIR/EIS. Regarding the visual aspects and vegetation of the riverfront, please also refer to responses to comments VIS-3, above, and VIS-6 and TE-37, below. Neither the Proponent's Proposed Project nor the alternatives would restrict recreational use of, or access to, Park District-owned land. Opportunities for increased recreational use may occur under Alternatives 2 and 3.

Carmel River Steelhead Association Comments on San Clemente Environmental Impact Report

Comment REC-5

The public has a legal right to boat and otherwise recreate on this part of the Carmel River and any attempt to buttress or maintain San Clemente or the old Carmel Dam needs to consider the interference of recreational values on this part of the river.

Response

CAW would not restrict recreational use to MPRPD-owned land **(Also REC-4)**.

SAFETY

WRITTEN COMMENTS RECEIVED

May 24, 2006 letter from Don Redgwick

Comment SA-1

The three most important issues to address are the safety of the dam, a sustainable water supply and the cost of the project. The worst case scenario of environmental degradation would be the "no project alternative followed by an earth quake and dam failure".

Response

Thank you for your comment. Comment noted.

NOTE: COMMENTS SA-2 THROUGH SA-4 CORRESPOND TO MAY 23, 2006 PUBLIC HEARING TESTIMONY

Comment SA-2

Steve Wilpert/Resident of Sleepy Hollow

I still don't get what the purpose of the project is. I see up on the board a very nice presentation, a dam safety project. I'm for dam safety. I'm for people not getting hurt during a hundred-year flow. I'm for people not getting hurt during a maximum credible earthquake. I'm for people not getting hurt when any dam might contribute to damage to peoples' property or people themselves. But I haven't seen anything or heard anything to suggest that the harm that this community is going to experience after a hundred-year storm event and after a maximum credible earthquake is going to be exacerbated by that old dam failing. I just don't get it. I like the people at Camp Stephanie. I don't dislike them. I don't dislike anybody that lives along the Carmel River. But I just – I just don't get it why we're talking about spending so much money for such a little impact relative to the destruction we're going to have around us from such a huge flow of water and such a large earthquake.

Response

It is possible that a MCE or Probable Maximum Flood (PMF) would have much greater effects on human health and safety than would a dam failure associated with such an event. However, it is DWR/DSOD's mandate to protect the public from harm caused by dam failure. CAW is required by law to provide a solution to deal with the currently unsafe dam.

Comment SA-3

Nikki Nedeff/Resident of Carmel Valley

I think that there needs to be attention paid to the maximum credible earthquake, maximum probable flood impacts on the upstream diversion dam that will reroute the flow of the river through the notch in the ridge.

Response

These criteria were considered in developing the current conceptual design. Final design of the diversion dike design will continue to make use of these criteria.

Comment SA-4

Nikki Nedeff/Resident of Carmel Valley

There also needs to be attention paid to how the face of exposed sediment that is exposed when the dam is taken down, the face of the exposed sediment on the Carmel River side is stabilized. Grout or rip-rap or anything structural will then withstand potential earthquakes or potential erosion if the Carmel River reoccupies its original channel. So I'd just encourage you to pursue those questions in your final impact analysis. Thanks.

Response

Thank you for this comment. Current conceptual design has considered these criteria. Please refer to the figures presenting the design in Section 3.5 of this Final EIR/EIS. Final design will continue to make use of these criteria.

June 28, 2006 letter from Jim Crenshaw/California Sportfishing Protection Alliance

Comment SA-5

It has been 26 years since the DWR's Department of Safety of Dams (DSOD) first began to look into the long-term safety of the San Clemente Dam and 16 years since an engineer hired by Cal-Am determined that the dam could fail in both MCE (Maximum Credible Earthquake) and PMF (Probable Maximum Flood) conditions. Meanwhile, human life, especially the Camp Stephanie community directly downriver, remains in danger from dam failure resulting from an earthquake with a magnitude as low as 5.5.

Response

Since 2002, several interim dam safety measures have been implemented at the direction of the Department of Water Resources, Division of Safety of Dams (DWR/DSOD), to reduce the downstream danger. These include an interim drawdown each winter. This is the lowest elevation that could be maintained under existing conditions. They also would include a monitoring and warning system in the event of an emergency. California American Water (CAW) proposed a dam strengthening

alternative which was acceptable to the DSOD in 1993 (see Chapter 1.6 of this Final EIR/EIS for a review of the history of DWR and CAW response to the safety concerns). Concerns raised by the National Marine Fisheries Service (NMFS) and the California Department of Fish and Game (CDFG) over impacts to the federally listed steelhead, numerous studies have been conducted to assess impacts and identify alternatives, including alternatives that would demolish the Dam. This process has taken a number of years and has resulted in a preliminary interest taken by the state of California, through the California Coastal Conservancy, in funding the Carmel River Reroute and Dam Removal (Alternative 3) project under a scenario in which CAW would turn over the project and property surrounding the Dam to a non-profit or governmental entity plus contribute a share of the funding necessary to complete the seismic safety project in compliance with DSOD specifications.

June 30, 2006 letter from Mindy McIntyre/Planning and Conservation League Foundation

Comment SA-6

It has been 26 years since the DWR's Department of Safety of Dams (DSOD) first began to look into the long-term safety of the San Clemente Dam and 16 years since an engineer hired by Cal- Am determined that the dam could fail in both MCE (Maximum Credible Earthquake) and PMF (Probable Maximum Flood) conditions. Meanwhile, human life, especially the Camp Stephanie community directly downriver, remains in danger from dam failure resulting from an earthquake with a magnitude as low as 5.5.

Response

See response to Comment SA-5.

Comment SA-7

Nowhere in the Draft EIR/EIS does it guarantee that the dam will survive a MCE with buttressing; that means the homes downriver are still in danger. If human safety is truly the first and foremost concern, buttressing must be looked at very critically, for it fails to fundamentally resolve the problem of an aging and unsafe dam, instead simply prolonging it.

Response

A buttressed dam has been evaluated under a Maximum Credible Earthquake (MCE), and reviewed by DWR/DSOD. It has been determined that this design will survive a MCE. The buttressing design will continue to be refined and reviewed throughout final design.

Comment SA-8

The river reroute/dam removal option will also permanently remove the seismic risk and threat of a large-scale flood, and will achieve the required solution in a much shorter timeframe than the dam buttressing option.

As discussed above, dam buttressing or notching is likely to result in the issuance of a Jeopardy Opinion concerning the California red-legged Frog or steelhead trout, protected species. This would protract the process indefinitely with potential legal challenges requiring lengthy review. Meanwhile, the [dam] would remain, as it is now, dangerous to Camp Stephanie and other residential areas downstream of the dam. It is also likely that other environmental groups will intervene in order to challenge reconsideration of impacts to wildlife and habitat of the Carmel River Watershed that will result with the Proponents Proposed Project, or Alternatives 1 and 2. Therefore river reroute and dam removal is the most expedient solution that will guarantee the flood and seismic risks are permanently eliminated.

If the Lead Agencies choose the Proponents Preferred Project or Alternative 1 or 2, it is likely that the Lead Agencies will be required to address inadequacy of the analysis of these alternatives in the [DEIR/S,] requiring the need to re-circulate the [DEIR/S] that will lead to further indefinite delays. We urge consideration of the first priority - to assure the safety of those living in the Carmel River Valley; the unsafe San Clernente Dam should be dealt with as soon as possible and therefore Alternative 3 is the technically superior project, with the most expedient outcome.

Response

It is not necessarily correct that Alternative 3 Carmel River reroute and dam removal) would be quicker to construct than a dam buttressing project (Proponent's Proposed Project). Based on equal scheduling assumptions, dam buttressing would in fact have the shortest implementation schedule.

It is uncertain whether dam buttressing or notching would result in a jeopardy opinion or not. The Proponent's Proposed Project would preserve existing habitat for California red-legged frogs (CRLF) above the Dam. However, any decision may be challenged and it is not possible to forecast with confidence what the likely schedule effect of conjectural challenges would be.

SEDIMENT

WRITTEN COMMENTS RECEIVED

May 24, 2006 letter from Don Redgwick

Comment SED-1

The concept that dams harm the environment by capturing sediment is about 99 percent wrong. Down stream sedimentation creates far more problems than it solves. Sedimentary buildup will usually lead to flooding and additional erosion caused by flow blockage. As the Grand Canyon is proof sediment usually ends up in the mouth of the river, bay or ocean.

Response

Thank you for your comment. Sediment transport is a natural river function. When interrupted, it can have multiple adverse physical and biological effects.

June 4, 2006 letter from Don Redgwick

Comment SED-2

The loss of capacity of the dam after the Marble Cone Fire and other years of heavy erosion could be an indicator of future erosion and sediment. Sediment seldom settles on the beaches or other preferred areas as some people seem to believe. Water Pollution Control Boards have been known to fine Contractors, Developers and others large sums of money for less than a truck load of dirt washing into a stream. Fish and Game requires a plan to be submitted and approved showing facilities and a program to control erosion. Flood Control Agencies spend millions of dollars annually in maintenance to control erosion and to stabilize river banks.

Response

Comment noted.

Comment SED-3

If the San Clemente Dam did not exist prior to the Marble Cone fire, what would be the estimated damage to Carmel Valley and Carmel Meadows? Would 2.4 million yards or more be in Carmel Bay if the dam was never built or would some of it have been trucked from homes, streets and parks?

Response

The question involves speculation as to the cause of existing conditions that form the environmental baseline for the evaluation of impacts, but are not themselves impacts of the project. As stated in the EIR/EIS the Dam and reservoir currently traps sediment from the upper watershed. The existing trap efficiency is about 35 percent, but would decline as the reservoir continues to fill.

Comment SED-4

The study should include comments on the containment of the sediment and the damage that 2.4 million yards of sediment would have caused during flood years and the benefits or harm that trees, silt and debris can do when not contained.

Response

This comment appears to refer to the theoretical damage that would have occurred if the sediment currently stored in the reservoir had passed downstream. Natural sediment transport is normally beneficial to stream environments. The storage of this sediment is an existing condition, which forms the environmental baseline for evaluation of impacts. It is not an impact of the project. The potential impacts of sediment passing downstream under each of the alternatives are described in Section 4.2 of the EIR/EIS.

June 21, 2006 letter from Carmel Valley Association/Robert Greenwood

Comment SED-5

The mass of sediment behind the dam, accumulated over many years, may contain toxic materials. When this sediment is moved or disturbed during the project, such toxics could contaminate CAW's municipal water supplies. We recommend a program to drill and sample the sediment pile to evaluate the possibility of such contamination.

Response

Samples from the impounded sediments behind San Clemente Dam (SCD) were collected and analyzed to assess the gradation of the sediment and the quality (ENTRIX 2002). The analysis of the quality found traces of Arsenic (As), Barium (Ba), Chromium (Cr), Copper (Cu), Nickel (Ni), and Zinc (Zn). However, none of the water quality parameters analyzed were found to exceed water quality standards. The results of the pore-water water quality analysis is in this Final EIR/EIS, Appendix X.

June 13, 2006 letter from John G. Williams, Ph.D.

Comment SED-6A

For example, in the notching alternative, in Section 3.3, the DEIR states at p. 3-40 that "Accumulated sediment would be removed down to the level of the notch," or 506 ft. However, at p. 3-56, it states that the new surface "would be at about the same grade as the current sediment surface," but lowered by about 19 feet.

Response

The term "grade" refers to the slope of the sediment surface. The slope of the final excavated sediment surface is proposed to be the same as the slope of the current sediment surface through the reservoir, only 19 feet lower. This new sediment surface would extend upstream from the notch in the Dam to the point where it intersects the natural channel bed. Because the sediment surface at the Dam would be lowered by 19

feet, the existing sediment surface grade would intersect the natural channel at a point that is currently covered with sediment. The sediment would be excavated and the natural channel restored from this point of intersection to the current upstream limit of sediment.

Comment SED-6B

Then, a channel shaped to carry approximately the two-year flow would be constructed, and the whole would be revegetated. However, constructing channels is not so simple (e.g., Kondolf et al. 2001), and the DEIR does not even provide relevant information such as what the existing gradient of the stream actually is. Put differently, there is an extensive channel reconstruction element to this alternative, but unlike the elements of the project that would occur at the dam itself, the channel reconstruction is described only vaguely.

Response

In the Carmel River arm, the existing sediment has an average slope of about 0.0009 ft/ft. In the San Clemente arm, the average sediment slope is about 0.0038 ft/ft. These slopes would be used as the approximate slope of the geomorphically stable channel for Alternative 1, Dam Notching. If this alternative is selected, the final characteristics of a geomorphically stable channel would be developed during the design stage. This EIR/EIS describes the expected impacts of a new channel cut through the stored sediment.

The Proponent's Proposed Project, Dam Strengthening, would not involve construction of a new channel. Alternative 1, Dam Notching would involve reconstruction of about 2,000 feet of new channel in the Carmel River and 1,000 feet in the San Clemente Creek arm. Alternatives 2 and 3 would remove the Dam and would involve complete reconstruction of the natural channel through the reservoir (about 7,000 and 3,000 feet in the Carmel River and San Clemente Creek arms, respectively).

Comment SED-6C

In the discussion of the by-pass option (p. 3-81), the DEIR states that "Removal of the reservoir sediment in the San Clemente Creek arm would expose the pre-1921 alluvial deposits in the river channel and floodplain through the historic reservoir inundation zone. A three-stage channel would be provided through selective contouring along San Clemente Creek. The channel the same as is described in Section 3.3." However, information about the pre-1921 alluvial deposits is not provided, nor does Section 3.3 provide an adequate description of the channel that would be provided.

Response

The location and slope of the pre-dam channel bed is described in the "Evaluation of Sediment Sluicing Options Associated with the San Clemente Dam Fish Ladder" (MEI 2007a), but information about the pre-dam alluvial deposits was not available for

this EIR/EIS. The size and shape of the final channel would be designed after an alternative is selected for permitting. To design a geomorphologically stable channel, engineers would consider the hydrologic and hydraulic conditions, background sediment contributions to the stream, available cross-section, and channel slope. The designers would start with the estimation of the equilibrium slope of a channel through the impoundment. The channel would be designed and sized with a main channel and overbank areas that would convey a range of flows and the anticipated sediment loads without erosion or deposition. The overbank areas would serve as a floodplain for higher flows. Overall, the channel would emulate a natural stream using the upstream channel as an analog system. The assumed cross-sections for a geomorphologically stable channel that were used in the sediment transport modeling are described in Figure 4.2-10 through Figure 4.2-14 of Section 4.2.1 of this Final EIR/EIS.

Comment SED-7

The sediment transport modeling is questionable. Sediment transport modeling was used to assess various alternatives (p. 4-123). In particular, the option of allowing the river to remove sediments in the notching alternative was rejected based on such modeling (p. 3-47). However, previous work by the engineering consultant used for the EIR, Mussetter Engineering, has been sharply criticized by experts from the United States Geological Survey (Andrews et al. 2002, attached; also available at: http://wwwrcamnl.wr.usgs.gov/sws/Trinity/TrinityReview.pdf).

The issue in question was this. In December 2000, after years of study, the Secretary of the Interior issued a Record of Decision (ROD) proposing a new flow regime in the Trinity River, downstream from a Bureau of Reclamation dam. On behalf of the Sacramento Municipal Utility District (SMUD), Mussetter Engineering produced a critique of a proposed flow regime, and SMUD used this critique in support of a proposal for an alternative flow regime that would have less impact on hydropower production. Essentially, Mussetter Engineering argued, based on sediment transport modeling, that the flow regime proposed by the ROD would reduce the habitat value of the Trinity River for salmon by flushing out spawning gravels. In 2002, The Bureau of Reclamation asked the United States Geological Survey (USGS) to review the issue. The USGS review, by E. D. Andrews, K. M. Nolan, and S. M. Wiele, can fairly be described as blistering, and contains statements such as "The model results displayed in the upper panel of Figure 40 are physically unreasonable" (p. 7, last paragraph). At the least, this history raises questions about the reliability of the sediment transport modeling used in the EIR. The modeling should be reviewed by independent experts before it is relied on to reject or assess alternatives.

Response

This comment references a study conducted for the Trinity River that has little relevance to the Carmel River. The current sediment model has been discussed and accepted by the agencies involved with the project.

Comment SED-8A

The gradient of the sediment in the San Clemente Reservoir may not be at equilibrium. There is an implicit assumption in the DEIR that the slope of the sediment in the reservoir is at equilibrium. However, this may well not be the case, and this could have important consequences for the notching alternative.

Response

Discussion in this Final EIR/EIS does not conclude that the stored sediment is currently in equilibrium. Moreover, the Final EIR/EIS text references that the reservoir would continue to fill (a non-equilibrium condition) over time.

Sediment flowing into the reservoir either continues through the reservoir or deposits in the impoundment zone (the current split is about 65 percent flow through and 35 percent storage, for the Baseline Condition). In addition, the river may also remobilize sediment in the impoundment that was deposited during previous storms, and convey the sediment through the reservoir.

The equilibrium slope of the current impoundment or of a proposed channel can be estimated through analysis of the hydraulics of the river flow, the tributary sediment load, and the sediment composition (gradation). Such an analysis would be performed as part of final channel design to assure a geomorphically stable channel.

Comment SED-8B

As noted in the DEIR, downstream coarsening of the sediment over time can be expected. As this occurs, the channel gradient will need to steepen to adjust to the resulting greater bed resistance. It would be useful to compare the existing gradient in the reservoir sediments with the channel gradient in geomorphically similar situations farther downstream, such as downstream from Sleepy Hollow. If the final gradient can be expected to be greater than the existing gradient, then the proposal for the notching alternative as presented in the DEIR would remove more sediment than necessary, at unnecessary financial and environmental cost.

Response

The existing gradient of the stored reservoir sediment reflects the fact that the area is an impoundment. This condition (impoundment) is not present in the river downstream of the Dam and therefore, one would not expect geomorphically similar conditions downstream. The final gradient of the channel through the stored sediment would be a function of the tributary sediment load, hydraulic conditions, bankfull discharge, and available channel cross-section. The combination of these factors would be considered in the design of the channel.

For the past several years, the water surface of the reservoir has been drawn down as an interim measure for seismic safety. This process has changed the slope of the water near the Dam from horizontal (a lake) to a steeper slope. During a recent site visit, it

was observed that the Carmel River has cut a channel through the impounded sediment in response to increased gradient of the water surface. The river formed a channel in response to the hydraulic conditions and found its point of equilibrium.

Comment SED-9

The acceleration of water as it nears the inside notch would create a small area of scour upstream from the dam[1], which would reduce the problem of sedimentation near the fish ladder.

As noted above, the sediment transport modeling should be reviewed, particularly regarding the option of allowing the river to rework sediments in the notching alternative.

Response

Sediment transport modeling has been updated for this Final EIR/EIS. The river currently reworks the sediment each year during the Annual Drawdown for Interim Seismic Safety Measures, required by the Division of Safety Dams (DSOD). The modeling reflects the conditions seen in the reservoir (see Section 4.2.1 of this Final EIR/EIS).

Comment SED-10

The DEIR does not justify removal of as much sediment as is assumed in the notching alternative. For example, it is not clear why sediments could not be left as terraces to one or both sides of the reconstructed channel. Reducing the amount of sediment removed in this alternative would reduce its financial and environmental cost.

Response

This Final EIR/EIS describes the impact that could be caused by the greatest amount of sediment removal for all alternatives. The total volume of sediment to be removed could be reduced during final design. In general, the channel would follow the slope of the existing sediment wedge in the reservoir, contain a bankfull channel, and be geomorphically stable. These design parameters would dictate the amount of sediment to remove. The final channel must have an overbank floodplain and therefore sediment must be removed or the channel would be entrenched.

Comment SED-11

Consider dredging a channel to the fish ladder, rather than flushing: For the alternatives that would leave the dam and require a fish ladder, the EIR should consider using a suction dredge rather than flushing to maintain a channel to the ladder. The slurry could be pumped to a settling pond or dewatering facility on the flat next to the dam, and the dewatered sediment could be removed by truck. Dredging would provide greater control over the operation, and minimize the discharge of sediment into the river.

[1] This scour just upstream from the dam is a typical feature of dams that are filled with sediment.

Response

The "Sediment Operation and Management Plan for Fish Passage" (SOMP) has been revised to clarify the sediment management issues raised in public comments (see Appendix J). The revised plan presents a toolbox of management options to maintain fish passage as sediment flows into and through the reservoir. Dredging with mechanical equipment or a suction dredge is one option identified in the SOMP to maintain passage through the sediment.

June 30, 2006 letter from Trish Chapman / California Coastal Conservancy

Comment SED-12

Carmel River Lagoon. The EIR/EIS should examine the current effects of dam sediment retention on the dynamics of the Carmel River lagoon, and then examine the impacts of sediment releases under the different alternatives.

Response

The current conditions in the lagoon that may result from the presence of the dam are an existing condition and are part of the baseline environmental conditions against which potential project effects are evaluated. Current conditions are not impacts of the project. The potential impacts associated with sediment releases under the different alternatives are evaluated throughout Section 4.2 of the Final EIR/EIS.

Comment SED-13

Issue FI-8 Upstream Fish Passage. The impacts of the Proponent's Proposed Project and Alternative 1 on upstream fish passage are not adequately described in the document. Both alternatives are described as beneficial to upstream fish passage. However, there will be permanent long-term impacts to upstream fish passage under these alternatives. Specifically the potential delay on fish passage may be significantly underestimated. Page 3-35 of the document acknowledges that "significant storm events might cause excessive build up and clogging of the upstream channel that cannot be cleared by sluicing alone." For this reason, the EIR/EIS anticipates the need for dredging the channel every 3 years. Based on this, it seems that passage could be blocked for significantly longer periods of time than are analyzed in the EIR/EIS if dredging is needed to clear the channel. **(Also FI-15)**

Response

The new fish ladder will create a better situation for upstream fish passage than current conditions. The SOMP in the Final EIR/EIS (Appendix J) has been revised to provide a greater focus on sediment management. Under the SOMP, dredging would be conducted in the fall to prepare the site to support fish passage. Large storm events would create backwater effects at the Dam and would generate turbulence immediately upstream of the dam that would maintain passage conditions upstream of the ladder. If an event occurs that renders the site impassible, a plan would be implemented to

remove sediment and debris from the upstream side of the ladder to restore fish passage as quickly as possible. This would be similar to a NMFS permitted activity that occurs on the Lower Yuba River at Daguerre Point Dam to maintain passage for Central Valley Chinook salmon and steelhead.

Comment SED-14

Issue FI-9 Sediment Impacts to Downstream Channels from Sluicing, Dredging of Sediment Transport Downstream. The impacts to steelhead from sediment caused by sluicing operations would be significant and permanent. The mitigation discussion states that "sluicing operations would begin with short duration sluices and impacts would be thoroughly evaluated to determine effects on downstream channels, habitats, and fishes." More information needs to be provided about regarding this intended course of action. What will be done to keep the upstream channel clear if short duration sluices are not sufficient to do so? What level or type of downstream impact would trigger a change in the SOMP, given that the impact is already identified as significant? If downstream impacts are such that different course of action is warranted, what would the alternative approach be to dealing with sediment in the reservoir? **(Also FI-17)**

Response

Impacts to downstream channels from sediment management activities are now addressed in Section 4.4 of the Final EIR/EIS under Impact Issue FI-9a. Additional sediment transport modeling, conducted in response to this, and other comments, indicated that sediment impacts to downstream channels related to sluicing and dredging would actually be long-term, less than significant for the Proponent's Proposed Project and Alternative 1 and short-term significant, long-term beneficial for Alternatives 2 and 3. Sluicing operations are detailed in the revised SOMP (Appendix J) in the Final EIR/EIS. The SOMP would be implemented as an adaptive management plan and would, therefore, allow for changes in the method of sediment removal, sluicing durations, periods, and volumes based on prevailing conditions and current fish data. The SOMP would be implemented in consultation with the National Marine Fisheries Service and the California Department of Fish and Game. Sediment management would be conducted proactively, as a preventative measure, rather than as a response to a problem that has been allowed to develop. Operations would involve the assessment of the need to remove sediment and reestablish a channel prior to each wet season. During the wet season, any reduction in channel capacity would be evaluated to assess the methods available to clear the channel and maintain fish passage. The methods available to maintain channel capacity and to respond to potential downstream impacts are described in the revised SOMP.

Comment SED-15

Appendix J, Sluicing Operations and Maintenance Plan. Based on the information provided in Appendix I, the Sluicing Operations and Maintenance Plan (SOMP) outlined in Appendix J does not seem sufficient to maintain a viable channel from the exit of the

fish ladder to the reaches above the reservoir. The impact discussion for Issue FI-9 states that sluicing operations would occur over a 1 to 4 hour event when flow is over 300cfs and increasing. According to Section 3.3 of Appendix I, the incised channel created by each sluicing event could be filled back-in within a few days. Given the unpredictability of stream flows in the river, sluicing will not provide a sufficient guarantee that there will be an adequate channel for fish passage from the exit of the fish ladder to the reaches above the river. The Proponent's Proposed Project and Alternative 1 must develop a more reliable way to insure fish passage past the ladder. **(Also FI-18)**

Response

The Final EIR/EIS presents an updated SOMP in Appendix J. The comment appears to misunderstand the function of the SOMP. Implementation of the SOMP is necessary to keep the upstream exit of the fish ladder open as sediment naturally flows into the reservoir and deposits. It is not needed to maintain passage in the river upstream of the reservoir. Currently, fish are able to pass through the channel formed by the river and can pass through the sediment upstream of the reservoir.

Comment SED-16

The sluicing operations presented for the Proponent's Proposed Project and the Alternative 1 are untested and lack specificity. In addition, the plan is based on migration records of an already residual run and an idealized world of average hydrology, single storm events and steady state conditions. Real operations, with the vagaries of real-time hydrology, sediment movement, debris and difficulty in access/operation during storm are likely to overwhelm the flexibility of the chosen system. The proponent's project and Alternative 1 need to define an alternate approach that would be used if sluicing operations are not adequate maintain fish passage without significant impacts on fish or downstream reaches. **(Also FI-19)**

Response

The Final EIR/EIS presents an updated SOMP (Appendix J). The revised SOMP fully recognizes the difference between average conditions and real-time hydrology. The adaptive management program can accommodate such differences. The SOMP presents the average conditions and a real-time example. The average conditions provide a method of evaluating the sluicing over a long-term data record and estimate the potential occurrence and duration of sluicing events. The real-time example shows how the process may work with an actual storm. Sluicing during a flood event is one method available. Dredging during low-flow conditions would be a non-flow dependant process to clear the channel.

Comment SED-17

Operations and Maintenance, Proposed Project and Alternative 1. Both the Proponent's Proposed Project and Alternative 1 will require permanent ongoing maintenance of the

fish ladder and the sediment behind the dam (through sluicing or other methods) to mitigate for impacts of leaving the dam in place. How will this maintenance be guaranteed? Will there be a maintenance endowment? **(Also FI-20)**

Response

Funding for operation and maintenance of the sluice gate would be provided through the normal budgetary process of the owner and paid by the revenues of the water system. The agencies permitting the project would be responsible for ensuring compliance with all permit conditions including this ongoing maintenance.

June 20, 2006 letter from Mark Delaplaine/California Coastal Commission

Comment SED-18

Examination of options for riverine morphology and beach and nearshore nourishment can and should be coordinated with these on-going efforts. The Commission staff will need information on the effects of this project on downstream morphology and coastal processes in order to complete our review and determine whether the proposed action, or alternatives, are consistent with Section 30233 (b) and (d) of the California Coastal Act.

Response

Thank you for your advice concerning the requirements of the Coastal Commission and the Coastal Zone Management Act. The project is located 18 river miles upstream of the mouth of Carmel River and does not adversely affect coastal zone resources. Existing conditions may be adversely affecting coastal zone resources, but these are not impacts of the project. Alternatives that provide beach nourishment are not within the scope of this EIR/EIS. The 2000 Recirculated Draft Environmental Impact Report (RDEIR [Denise Duffy & Associates 2000]) considered sediment management alternatives that would allow natural transport of accumulated sediment downriver and to the coastal zone. This was found to have unacceptable impacts to fish spawning and to public safety due to potential flooding associated with riverbed aggredation. In preparing the EIR/EIS, California American Water explored the market potential for the accumulated gravel and sediment, and learned that the cost of removing it would exceed its market value. The associated traffic and safety impacts and cost of excavating and trucking sediment to beaches for nourishment would be similar to those identified in the 2000 RDEIR for sediment removal via truck; these impacts were considered unacceptable and those alternatives were eliminated from consideration in this EIR/EIS.

The reservoir currently has a trapping efficiency of about 35 percent. This means that most of the natural sediment inflow to the reservoir is trapped, and a smaller amount is passed through the reservoir to the river downstream of the Dam. As the remaining volume in the reservoir (about 100 acre-feet) fills, the trapping efficiency would

decrease and more of the natural sediment load would pass downstream. All of the alternatives, including the No Project Alternative, would pass greater sediment loads in the river downstream of the dam relative to existing conditions, either through sluicing or because the alternatives would allow the full natural sediment load to pass the dam site. Sediment modeling indicates that these sediments would distribute along the length of river from the dam to the ocean. Ocean conditions and beach-forming processes were not modeled as part of this EIR/EIS, but it is reasonable to expect a future increase in sediment load to the ocean.

Comment SED-19

Introducing sediment into the river by sluicing, as in the proposed project and alternative 1, could adversely affect steelhead and their habitat by causing abrasion of the fish, decreased dissolved oxygen, disturbance of streambeds and filling of the interstitial spaces between spawning gravel. Where the sluicing operations are described in the Draft EIR/EIS as mitigation for "short-term, significant and unavoidable" effects, it would appear that the mitigation itself could possibly cause long-term changes in the amount and type of sediment transported from the upper watershed to the lower Carmel River, changes in the sediment composition in the river and changes in the amount of sediment stored in the river below SCD. The sluicing operations proposed require further study to determine their efficiency and long-term effects, particularly with regard to the part of the river that is in the coastal zone. **(Also FI-21)**

Response

Sediment would not be unnaturally introduced into the river by sluicing because sediment transport is a normal feature of the watershed and suspended sediment concentrations naturally increase as river flow increases. As noted in the response to comment SED-18, above, all of the alternatives would begin passing sediment downstream within six to ten years, including the No Project Alternative. The sediment load transported past the Dam would be controlled by the remaining space in the reservoir. Under Alternatives 2 and 3, dam removal would lead to downstream transport of the natural sediment load. Under Alternative 1 and the Proponent's Proposed Project, sediment would be passed in the more concentrated period of time associated with sluicing (see the revised SOMP in Appendix J of the Final EIR/EIS). Once the reservoir fills with sediment, a large portion of the natural sediment load would pass downstream even under No Project conditions.

June 6, 2006 letter from John W. Fischer

Comment SED-20

David Zaches raised the question about possible toxins in the sediment proposed for use in the old river channel. The bottom layers of sediment have been there for many years; who knows what was used on the land during the 1920's and 30s? Have core samples been taken to better understand what may be there?

Response

Samples from the impounded sediments behind SCD were collected and analyzed to assess the gradation of the sediment and the quality (ENTRIX 2002). The analysis of the quality found traces of Arsenic (As), Barium (Ba), Chromium (Cr), Copper (Cu), Nickel (Ni), and Zinc (Zn). However, none of the water quality parameters analyzed were found to exceed water quality standards. The results of the pore-water water quality analysis is found in the draft EIR/EIS, Appendix H.

June 29, 2006 letter from David A. Berger/Monterey Peninsula Water Management District

Comment SED-21

Table 2.1, WR-2 through WR-5. This table does not describe ongoing stream degradation (incision into alluvial deposits) downstream of San Clemente Dam due to retention of sediment load within the reservoir. MPWMD notes that the Mussetter studies of sediment transport in the river under various alternatives set an artificial barrier (for modeling purposes) that did not reflect the potential for incision.

Response

Any ongoing degradation of the stream channel is part of baseline environmental conditions against which the alternatives are evaluated. It is not an impact of the project.

Comment SED-22

MPWMD research in the early 1980's showed that the river had incised into floodplain deposits by up to 13 feet along much of the river since the reservoir was built. Recent surveys along the river indicate that this trend has not halted and the rate of degradation is estimated to be about one foot per decade, which has contributed to bank destabilization and undermining of infrastructure across and adjacent to the river. The dam thickening and dam notching alternatives are not likely to significantly slow or reverse this process, as most of the sediment load will be retained upstream of the existing dam location for several decades. The reroute and removal alternatives are likely to slow or halt the degradation process as the sediment load to the lower river would be increased substantially. The differences to downstream bank stability and infrastructure stability from each alternative should be described.

Response

Continuing or reversing ongoing degradation of the downstream channel is not evaluated in the EIR/EIS because it is part of baseline environmental conditions against which the alternatives are evaluated. Existing conditions are not impacts of the project.

Given that there is only 100 acre-feet of storage remaining in the reservoir (mostly in the San Clemente Creek arm) and an annual sediment influx of about 16.5 acre-feet, the reservoir would not continue to trap most of the natural sediment load for several decades. Sediment modeling indicates that the trapping efficiency of the reservoir would

decrease over time. The benefits of Alternatives 2 and 3 to the river are described in Section 4.2. It is not clear what is meant by "infrastructure stability" in this comment.

Comment SED-23

Page 2-2, Paragraph 2: The statement, "Two high-level outlets equipped with sluice gates would be installed to control and limit sediment releases…", appears to conflict with the description of one mid- and one high-level outlet on page 3-26 and does not match the proposed limited operation of sluice gates during the winter period (see also comment on Page 3-18). The FEIR/EIS should fully evaluate how operation of proposed gates would control and limit sediment releases and include an evaluation of the timing of sediment releases based on MPWMD's record of reconstructed unimpaired streamflow at San Clemente Dam.

Response

The design of the Proponent's Proposed Project and Alternative 1 has been revised in the Final EIR/EIS to consolidate all sluicing in a single gate (see Sections 2.1.1, 3.2.4 and 3.3.4). Figures 3.2-5 and 3.2-6 show the revised design.

The timing of sediment releases was evaluated through sediment transport modeling (Appendix S, MEI 2006 and 2007) and the Final EIR/EIS has been updated to incorporate this work (see Section 4.2 and the revised SOMP, Appendix J).

Comment SED-24

Page 2-5, Paragraph 4: Under Description of No Project: Conclusion. "The existing drawdown ports in the dam and the existing fish bypass facility would both likely remain operational until the reservoir fills with sediment." At the beginning of the winter of 2005 to 2006, sediment in the mainstem was within about 20 feet of the easterly port opening. It is likely that use of the ports will be in jeopardy well before the entire reservoir fills with sediment because the bulk of the remaining reservoir storage is on the San Clemente Creek side of the reservoir and is filling much more slowly than the mainstem side. The FEIR/S should evaluate whether the existing ports will be used and how in the No Project setting.

Response

Under Alternative 4 (No Project), if no sediment management action is taken the existing ports would become non-operational as sediment accumulates. As this comment points out, the filling may occur sooner in the Carmel River arm and therefore the ports would be unusable before the entire reservoir is filled. However, as noted in the summary description of Alternative 4 presented in Draft EIR/EIS Section 2.1.5, "minor sediment removal may occur to allow the dam to maintain the existing surface water supply intake serving the upper Carmel Valley Village area." Sluicing or dredging (or both) would be needed to remove the sediment.

Comment SED-25

Page 3-5, Paragraph 1: Under Sediment Management Alternatives, the FEIR/S should fully evaluate the long-term impacts associated with trapping gravel and cobble with each alternative. The FEIR/S should fully evaluate options for stockpiling and releasing gravel and cobble into the river channel below the project area as mitigation for trapping of coarse bedload.

Response

Trapping of gravel and cobble in the reservoir is an existing condition. It is not an impact of the project and does not require mitigation.

As the reservoir fills, the amount of bedload, including sand, gravel, and cobble that passes through the reservoir to the downstream river would increase. Therefore, the amount of coarse bedload historically trapped in the reservoir would decrease and more of this size fraction would become available to the lower river. The option of stockpiling gravel and cobble for release downstream is described in the revised SOMP (Appendix J).

Comment SED-26

Pages 3-25 and 3-26: The text briefly describes operation of dual high-level ports, but the modeling completed by Mussetter Engineering Inc. only examined the impacts and scenario of operating one of the ports. If the proposed sluice gates are shown correctly in Fig. 3.2-6, then the potential impacts from sluicing at each of the proposed levels should be reevaluated and effects such as headcutting in the reservoir sediments and release of fine material to downstream reaches should be identified. The FEIR/S should fully evaluate the timing, duration, and magnitude of sediment releases to the areas downstream of San Clemente Dam and the impacts to aquatic resources resulting from the discharge of sediment.

Response

The design of the Proponent's Proposed Project and Alternative 1 have been revised in the Final EIR/EIS to consolidate all sluicing in a single gate (see Sections 2.1.1, 3.2.4 and 3.3.4). Figures 3.2-5 and 3.2-6 show the revised design.

The Final EIR/EIS has been updated to evaluate the release of sediment to the downstream river as simulated using sediment transport modeling and described in Section 4.2 of the EIR/EIS and the revised SOMP (Appendix J). Sediment management by sluicing or other methods would maintain passage through the channel immediately upstream of the fish ladder. Therefore, a headcut is not expected to form in the channel further upstream of the dam. Sediment would be released to the lower river under all of the alternatives. Under Alternatives 2 and 3, most, or all, of the natural sediment load would pass the dam site to the lower river. Under the Proponent's Proposed Project and Alternative 1, the majority of the natural sediment load would pass through to the lower river and a smaller percent would be retained in the impoundment. The sediment

transport modeling estimated that the current reservoir trap efficiency of 35 percent would decline to 22 percent after the reservoir fills (the 2030 baseline condition).

Comment SED-27

The FEIR/S should fully evaluate how the ports would be operated in conjunction or separately, and the impacts of the operation on sediment mobilization, passage and deposition in the river below the dam should be evaluated and described. While a brief description of sluice gate operations is provided, the proposed schedule has not been combined with the reconstructed record of unimpaired flows to provide a full description of the frequency and duration of operation and how this will affect migration of adults and juvenile fish.

Response

The design of the Proponent's Proposed Project and Alternative 1 has been revised in the Final EIR/EIS to consolidate all sluicing in a single gate (see Sections 2.1.1, 3.2.4 and 3.3.4). Figures 3.2-5 and 3.2-6 show the revised design.

The operation of the sluice gates is an adaptive management process, responding to flows, sediment deposition, and fish passage requirements. While an examination of the unimpaired average daily flow is helpful in identifying the potential opportunities for sluicing, it does not identify the actual sluicing pattern. Please refer to the revised SOMP (Appendix J) for more detail on the frequency and duration of sediment management operations, and to Section 4.4 of the Final EIR/EIS for effects to migrating fish.

Comment SED-28a

Page 3-35, Paragraph 3: Last Sentence, "Dredging upstream of the fish ladder would occur on average every three years, where significant storm events might cause excessive build up and clogging of the upstream channel that cannot be cleared by sluicing alone (using the proposed sluiceway next to the fish ladder exit)." The FEIR/S should provide detailed analysis and review of the studies that led to an average of every three years and clarify the frequency of dredging, which is not clear. Is this one day of dredging every three years, or multiple days every three years?

Response

The Final EIR/EIS presents an updated SOMP (Appendix J) and the evaluation of sediment sluicing options are in Appendix S (MEI 2007a and MEI 2007b). Please refer to this update for information regarding proposed sediment management.

Comment SED-28b

What happens in years when sustained high flows result in rapid refilling of the area between the ladder exit and the sluiceway opening?

Response

As described in the updated Section 4.2 of the Final EIR/EIS, sediment transport modeling indicates that high flow periods would carry sediment through the reservoir or deposit it in the upstream portion of the remnant pool. The low-flow condition would present the greatest opportunity for depositing sediment near the fish ladder, not the high-flow condition. The sediment front would not directly contact the fish ladder, even during high flows. A remnant pool would remain in front of the fish ladder, which would be sufficient for fish to leave the ladder and make their way upstream above the Dam, as discussed in the Final EIR/EIS Sections 4.2 and 4.4.

Comment SED-28C

Does dredging include maintaining the San Clemente Creek channel? The FEIR/S should fully evaluate operation and maintenance of channels leading from both San Clemente Creek and the mainstem to the fishway.

Response

Dredging would be applied to both the Carmel River and San Clemente Creek arms of the reservoir and in the remnant pool upstream of the fish ladder. This Final EIR/EIS (Sections 4.2 and 4.4) and the revised SOMP (Appendix J) describe and evaluate how fish passage will be maintained in both arms.

Comment SED-29A

Page 3-40, Paragraph 1: "Accumulated sediment behind the dam would be removed down to the level of the notch." The portion that is coarse, including coarse sand, gravel, cobble and boulder should be sorted and remain in the reconstructed channel and floodplain for habitat restoration.

Response

Thank you for pointing this out. The restored channel would utilize the available material for creation of a stable channel. Currently, the gradation of the sediment in the reservoir ranges from sand to boulders.

Comment SED-29B

In addition, removal of all material down to the level of the notch may result in an unstable or undesirable channel configuration through the remainder of the deposit. For the FEIR/S, a plan view, cross-sections, and a profile of the remaining reservoir deposits that show a geomorphically stable channel should be provided.

Response

Final design is not provided in the Final EIR/EIS, however, a typical cross section is presented in Figures 4.2-10 and 4.2-11 of the Final EIR/EIS. The final channel cross-section and plan view would be determined in the design of the channel if this

alternative is selected. The removal of stored sediment down to the notch would include excavation and creation of a geomorphically stable channel upstream of the dam. That is, excavation would remove excess sediments and the design channel would be constructed within the excavated area. The finished channel would consist of a bankfull channel with an adjacent floodplain.

Comment SED-30

Page 3-41, Paragraph 1: "Notching San Clemente Dam to approximately elevation 506 in the area of the existing spillway bays…" The lower portion of the dam notch appears to be significantly wider than a channel that would be excavated through the sediment remaining upstream of the dam. The FEIR/S should show the transition (plan view, cross-sections, profile) between channels in the reservoir sediments, modified dam, and channel downstream. Does the configuration of the modified dam encourage the mobilization of sediment from behind the notched dam? **(Also AA-38)**

Response

Final design is not provided in this Final EIR/EIS; however, a typical cross-section is presented in Figures 4.2-10 and 4.2-11 of the Final EIR/EIS. The final channel cross-section and plan view would be determined in the design of the channel. The mobilization of sediment is discussed in Section 4.2 of this Final EIR/EIS. While it is true that the spillway is wider than the upstream channel, the channel would not directly contact the spillway. The channel through the sediment upstream of the Dam would empty into the remnant pool discussed in this Final EIR/EIS. This pool would be in contact with the spillway notch and would provide the transition between the geomorphologically stable channel and the spillway.

Comment SED-31

Page 3-47, Paragraph 1: "Previous sediment transport modeling studies determined that removing or notching the dam and letting the river flush the sediments downstream in an uncontrolled manner would pose unacceptable risks for sediment accumulation and flooding in downstream reaches of the river." MEI (2005) documents the quantity of sediment above elevation 506 and the amount of sediment that would build up in the river channel as a result of notching (120 to 140 AF at the end of the 41-year simulation (Figure 2.3, MEI [2005]). Considering this relatively small quantity of accumulated sediment, the FEIR/S should fully evaluate whether removal and storage of 930 AF of sediment is actually needed to mitigate for the long-term deposition of 120 to 140 AF in the river channel and whether the risk could be reduced to baseline conditions (No Project) by removing and storing significantly less material.

Response

It is unclear what the commentor is asking; however, in order to create a stable structure for seismic and flood safety, it would be necessary to remove 930 AF of sediment.

Comment SED-32

Page 3-56, Paragraph 3: "Dredging upstream of the fish ladder would occur on average every three years, where significant storm events might cause excessive build up and clogging of the upstream channel that cannot be cleared by sluicing alone (using the proposed sluiceway next to the fish ladder exit)." Where are impacts and mitigations from the dredging described? What information was used to determine the frequency of dredging?

Response

Please refer to updated evaluations of sediment management in Sections 4.2 and 4.4 in this Final EIR/EIS, and the updated SOMP (Appendix J). Chapter 3 of the Final EIR/EIS describes the alternatives; please refer to Sections 4.2 (Hydrology and Water Resources), 4.3 (Water Quality), and 4.4 (Fisheries) for the evaluation of impacts and statements of mitigation. In the Draft EIR/EIS, the frequency of dredging was described on page 3-56 as a means of framing the typical need for channel clearing. The Final EIR/EIS explains the actual need for dredging, which would be conducted and monitored proactively as needed (see revised SOMP, Appendix J).

Dredging would cause a short-term impact associated with increased turbidity. However, as described in the revised SOMP (Appendix J), dredging and other actions needed to clear the entrance to the fish ladder would occur before the start of the wet season when fish are typically not migrating through the impoundment. Therefore, this impact would be less than significant (Impact Issue FI-9b).

Comment SED-33

Page 3-80, Paragraph 1: "The channel profile…includes a diversion sill at the channel upstream El. 530 to minimize downstream sediment transport and a slightly steeper slope than the natural geometry." What portion of the gravel, cobble and boulders stored upstream of this location in the mainstem would be mobilized and pass downstream? Would a sill limit future recruitment of beneficial substrate (material coarser than sand) and for how long? How would dynamic equilibrium be established with a sill in place?

Response

The sill described in the alternative refers to a hard point at the upstream end of the constructed bypass at the junction with the Carmel River. Depending on the parent material underlying the hill that would be excavated between the Carmel River and San Clemente Creek for the bypass, a natural sill may be available if there is bedrock

present. Such a hard point would not limit upstream gravel recruitment. However, the stored sediment at this end of the reservoir is about 30 feet deep and could erode without the presence of a hardpoint.

The description referenced in the comment is modified to remove the phrase to minimize downstream sediment transport. The presence of a hard point at the upstream end would help maintain the design channel slope but it is not intended to minimize sediment transport. Sediment stored in the Carmel River channel upstream of this point would be available for transport downstream.

Comment SED-34

The FEIR/S should fully evaluate effects on spawning and rearing habitat in the reach below the diversion sill and the time period before natural recruitment of gravel begins to pass this location.

Response

The impacts to spawning and rearing habitat for each alternative were presented in Table 4.4-10 and discussed in Fisheries Section 4.4 under the Impact Issue FI-9a of the Final EIR/EIS.

Table 4.4-11 has been updated in the Final EIR/EIS to more clearly spell out the differences between the alternatives.

Comment SED-35

If the reroute alternative is the selected project, mitigation measures should include removal and storage of gravel and cobble in the old inundation zone of San Clemente Reservoir to be placed into the diversion channel.

Response

Comment noted. These measures will be considered in final design of the diversion bypass.

Comment SED-36

Page 4-17, fourth paragraph. "The distribution of sediment downstream of the dam as a result of sluice gate operations was not modeled for the Proposed Project or Alternative 1 but MEI stated that downstream impacts under the Proposed Project with the implementation of the sluice gate would be similar to impacts simulated for Alternative 1 (Dam Notching) (MEI pers. comm. March 2006)." Appendix I states "… that quantitative sluicing modeling was performed for the Proposed Project." Please clarify and resolve these statements.

Response

In response to this, and other comments, an additional evaluation of the effects of sluicing, based on sediment transport analyses prepared by MEI (2007a and 2007b), was conducted. Please refer to Sections 4.2 and 4.4 of the Final EIR/EIS, and the revised SOMP (Appendix J), for the additional information.

Comment SED-37

Page 4-25, bottom paragraph. "Sluicing would transport gravels as well as fine sediments downstream. The composition of the sediment loads would be similar under the Proponent's Proposed Project, Alternative 1 and Alternative 3. An increase in the transport of coarse sediment would occur, and would be beneficial for downstream fish and riparian habitats."

Sluicing under the PPP and Alternative 1 is proposed at flows of 300 to 700 cfs and fine material will continue toward, and presumably down, the fish ladder at flows of less than 50 cfs. Under both Alternative 2 and 3, sediment would be transported according to the available stream power, with no restrictions or artificial barriers. How can the composition of sediment loads to the downstream reaches under the PPP, Alternative 1, and Alternative 3 be similar when sluicing operations cease at flows greater than 700 cfs while sediment will continue to be routed through the bypass at flows up to the PMF?

Response

The downstream sediment loading for the Proponent's Proposed Project, Alternative 1, and Alternative 3 are similar because each would allow sediment storage upstream of the dam site. With the Proponent's Proposed Project and Alternative 1, the sediment would be stored upstream of the SCD. With Alternative 3, the sediment would be stored in the floodplain of the restored channel and upstream of the bypass sill. For large flows under the Proponent's Proposed Project and Alternative 1, a portion of the sediment would flow through the reservoir and over the spillway to the lower river. The modeling simulations indicated that the trap efficiency would decline to about 22 percent for the Proponent's Proposed Project and 10 percent for Alternative 1. Under these efficiencies, the majority of the sediment load would flow over the Dam and downstream. Alternative 3 would have a trap efficiency of 14 percent and 11 percent for the wet and dry year hydrology, respectively. These efficiencies are similar to the simulated efficiencies for Alternative 1 (see Table 4.2-4 of this Final EIR/EIS).

Comment SED-38

Although no definitive estimate is given of how long it would take for sediment to prograde to the fish ladder after several sluicing operations have been completed, it is apparent that flows in the 30 to 50 cfs range have the ability to cause sediment deposits to prograde rapidly toward the fish ladder after a sluicing event. These flows occur between 40 percent and 50 percent of the time during the period December 1 to May 31

(Figure 5, Appendix I) or between 72 and 90 days per year, on average. There would appear to be numerous opportunities for sediment to move toward the fish ladder, while the number of days for optimum sluicing conditions is much lower at 13 to 27 (i.e., between 300 and 600 cfs as flow is rising or between 7 percent and 15 percent of the time).

The analysis in Appendix I and the operations proposal in Appendix J does not address the low flow condition (30 to 50 cfs) where sediments rapidly prograde to the fish ladder in as little as five days with no storms on the horizon to maintain the ladder in a sediment-free state.

Response

The issue of low-flow movement of sediment toward the fish ladder is addressed in Section 4.2 of the Final EIR/EIS. The recommended treatment is to maintain the water surface elevation in the remnant pool at the spillway elevation. This would be accomplished by controlling the flow through the fish ladder.

June 15, 2006 letter from Pam Krone-Davis/RisingLeaf Watershed Art

Comment SED-39

We feel that the sediment and the area behind the dam is now being looked upon as a liability, but that it should instead be looked upon as an asset.

Response

Thank you for your comment. The commenter's intent in characterizing the sediment as an asset is not clear.

Comment SED-40

What is the best use of the sediment behind the dam for the long-term ecology and human use? Is the silt best returned to the ocean by a many year process to re-sand the beaches? Is it best to let the silt remain for an ecological purpose, i.e. as a habitat, as a base for growing a meadow or woodlands?

Response

Sections 3.3.4 and 3.4.4 of this Final EIR/EIS explain how sediment would be excavated and disposed of at Site 4R under Alternatives 1 and 2. Section 3.5.4 describes how it would be stabilized in place under Alternative 3. Although there may be many beneficial uses for the sediment, alternatives that provide beach nourishment or explore other uses of the sediment are not within the scope of this EIR/EIS.

June 30, 2006 letter from Dick Butler / National Marine Fisheries Service (NMFS)

Comment SED-41

NMFS believes the use of sluice gates as proposed in the Proponent's Proposed Project and Alternative 1 is a fatal project flaw.

Response

Thank you for your comment. This letter does not explain further how the sluice gates comprise a fatal flaw. Other comments from NMFS bearing on the issue are given below.

June 30, 2006 comments from National Marine Fisheries Service

Comment SED-42

NMFS participated in the detailed sediment transport analysis conducted after the August 2000 Draft EIR/EIS was submitted. That Draft EIR/EIS also proposed dam strengthening and sluice gates. NMFS' significant commitment during those sediment transport studies was primarily to ensure dam removal was given adequate examination. NMFS was also establishing a systematic methodology for future analysis regarding the San Clemente Dam. NMFS expects that level of analysis for the proposed sluicing operations, but the Draft EIR/EIS does not include those results.

The results of a defendable systematic analysis would include suspended sediment concentrations from the dam to the ocean for a full range of hydrologic conditions. Suspended sediment in the water column, as well as habitat alteration, would be addressed. The Draft EIR/EIS has taken an unacceptable short cut in analyzing a project that proposes to adversely effect – in perpetuity – the most essential steelhead run in the S-CCC DPS. **(Also NEPA/CEQA-23)**

Response

In response to this, and other comments, an additional evaluation of the effects of sluicing, based on sediment transport analyses prepared by MEI (2007a and 2007b) was conducted. Please refer to Sections 4.2 and 4.4 of the Final EIR/EIS, the revised SOMP (Appendix J), and Appendices M and S for the additional information.

Comment SED-43A

The Proponent's Proposed Project and Alternative 1 will require the San Clemente Dam to continue to store sediment. Stored sediment in the reservoir will continue to be a steelhead passage impediment above the ladder.

Response

Please refer to Sections 4.2 and 4.4 of the Final EIR/EIS, and the revised SOMP (Appendix J), for updates addressing this comment. The SOMP, which has been

revised in response to this and other comments, is intended to manage the sediment upstream of the fish ladder to provide fish passage.

Comment SED-43B

The flaws within the Sluicing Operations and Maintenance Plan are that actual sediment sluicing operations are likely to vary considerably, depending on the sediment delivery events to the reservoir and sediment deposition patterns in the reservoir. With the continued filling of the reservoir with sediment, NMFS expects there will be a braided channel near the upper end of the reservoir that will further impair steelhead passage.

Response

Please refer to Sections 4.2 and 4.4 of the Final EIR/EIS, and the revised SOMP (Appendix J), for updated information addressing this comment. The upper end of the reservoir has a channel that has naturally formed and is armored with gravel and lined with a riparian corridor. This riparian corridor has now extended further downstream into the reservoir (see Section 4.2.1 of this Final EIR/EIS). A braided channel is not expected to form at the upstream end of the reservoir.

Comment SED-44

The Draft EIR/EIS states sluicing is expected to occur two-to-three times per year based on the number of flow events that occur over the winter and the length of the (steelhead) migration season, while the Sluicing Operations and Maintenance Plan states sluicing would occur over several hours once or twice a year, yet Appendix I states that aggradation would prograde near the fish ladder inlet in 5 to 20 days, depending on stream flow. NMFS infers from Appendix I that sluicing may be required more frequently than one-to-three times per year. Therefore, based on the information in Appendix I, it is unclear how sluicing as described in the Draft EIR/EIS and the Sluicing Operations and Maintenance Plan meets the basic objective of sediment sluicing: control sediment build-up in the river channel in the reservoir immediately above the San Clemente Dam to facilitate adequate steelhead passage opportunities through the fish ladder.

Response

Please refer to Sections 4.2 and 4.4 of the Final EIR/EIS, and the revised SOMP (Appendix J), for updated information addressing this comment. The description of the frequency of sluicing or other sediment management activities has been clarified in the revised SOMP. The SOMP is now an adaptive management plan which would be carried out in consultation with NMFS and other appropriate agencies. The number and frequency of sluicing events needed would be determined based on monitoring and would be conducted proactively whenever possible. Modeled simulations suggest that a single two-hour sluice would keep the remnant pool open for passage through the wet season.

Comment SED-45

The Mediterranean climate of the Carmel River Valley is prone to seasonal, prolonged and severe droughts. Wildfire and flooding are also part of the Carmel River watershed processes. The Carmel River watershed generates and stores sediment during normal or low-flow years and the river depends upon high flows for extremely high transport rates during wet years. Therefore, the Draft EIR/EIS use of average hydrologic conditions when analyzing the downstream effects of sediment sluicing and for the design of the Sluicing Operations and Maintenance Plan is inappropriate. NMFS is concerned how the Sluicing Operations and Maintenance Plan will be implemented in dry and wet years.

Response

Please refer to Sections 4.2 and 4.4 of this Final EIR/EIS, and the revised SOMP (Appendix J), for updated information addressing this comment. All hydrologic year types were used in the sediment transport modeling and the assessment of sluicing operations. In wet or dry years, sluicing would occur in response to fish passage needs based on the criteria established in the revised SOMP.

Comment SED-46

Although the Sluicing Operations and Maintenance Plan includes a Proposed Sluicing Decision Tree, the decision-making processes of how often to sluice and the determination of whether a sluicing event was successful have not been adequately described. For instance, the criteria of whether flows that are increasing are likely to exceed 300 cubic feet per second (cfs) have not been described. The criteria for determining whether "storm precipitation predicted to be significant" have not been described. Also lacking are the real-time methodologies and criteria for measuring and monitoring the incision goal.

Response

Please refer to the revised SOMP (Appendix J), for updated information addressing this comment. Additional information has been provided in the revised SOMP to clarify when and for how long sediment maintenance activities would occur. The criteria for determining when optimal flows are likely to occur are described in the revised SOMP, and would be employed as part of an adaptive management plan which would be carried out in consultation with fisheries agencies.

Comment SED-47

NMFS has determined the Proposed Sluicing Decision Tree in the Sluicing Operations and Maintenance Plan is too simplistic and does not account for all the unforeseen and unpredictable events that can occur each year. Each step in the Decision Tree asks questions that are difficult, if not impossible, to answer accurately. **(Also FI-57)**

Response

Please refer to the revised SOMP (Appendix J), for updated information addressing this comment. The decision tree presents the general progress of an adaptive management plan for sediment management to maintain fish passage upstream of the Dam which would be carried out in consultation with fisheries agencies. Additional text has been added to the revised SOMP to clarify the procedures when following the decision tree diagram.

Comment SED-47a

Is sediment delta passage a problem? How will passage problems be determined? When will it be determined when sluicing is to occur? Making a determination before the winter migration period may be inaccurate due to changing conditions behind the reservoir once high flows begin. Please clarify how channel depth and width within the reservoir will be measured during the high flow season in order to initiate sluicing. Since steelhead tend to migrate on the descending limb of a storm, how feasible and safe is it to place crews out on the reservoir to measure channel dimensions during storm events? **(Also FI-57a)**

Response

Please refer to Sections 4.2 and 4.4 of this Final EIR/EIS, and the revised SOMP (Appendix J), for updated information addressing this comment. The revised SOMP describes the criteria needed to trigger sediment management activities. The SOMP anticipates the need for fish passage every year and therefore proposes methods to assure that the channel is clear before the start of the wet season. Sediment management would not be anticipated to be needed during every storm. Safety is not anticipated to become an issue constraining the ability to implement the SOMP. The trigger mechanism for sediment management is not the flow depth and width as suggested in the comment. If there is a measurable channel cross-section that can convey the winter flows, then fish passage is already present. The need for sediment management would occur near the entrance to the fish ladder.

Comment SED-47b

If sediment delta passage is a problem, but increasing flows are predicted not to exceed 300 cfs, sluicing will not occur. However, passage has already been determined to be impacted. How will fish pass through the blocked sediment delta during their migration before a sluice event has been performed? These delays need to be addressed. **(Also FI-57b)**

Response

Please refer to Sections 4.2 and 4.4 of this Final EIR/EIS, and the revised SOMP (Appendix J), for updated information addressing this comment. The revised SOMP clarifies the other tools available for sediment management if sluicing is not an option

and provides a toolbox of options to control sediment in front of the fish ladder before a problem develops.

Comment SED-47c

Is it peak migration season? Peak migration season is generally between February and March, however, it depends on the hydrologic cycle as to when the majority of fish migrate. **(Also FI-57c)**

Response

Please refer to Sections 4.2 and 4.4 of this Final EIR/EIS, and the revised SOMP (Appendix J), for updated information addressing this comment. Sediment management is not anticipated to be needed in every year or every migration period.

Comment SED-47d

Will a passage problem potentially develop during the next storm event? How will this be determined? It is unknown how large or small the next storm event will be and how much sediment will be carried into the reservoir. **(Also FI-57d)**

Response

Please refer to Sections 4.2 and 4.4 of the Final EIR/EIS, and the revised SOMP (Appendix J), for updated information addressing this comment. Development of a geomorphically stable channel upstream of the dam would include determining sediment transport relationships for the design channel to use as a predictive tool to forecast sediment inflows for different flow events. Also, data collected through the sediment management process would be used to adjust future actions. The sediment management program would be an adaptive management process that would use real-time measurements, historic data, and an understanding of the physical processes to maintain fish passage out of the fish ladder to the upstream reaches of the river. All of these factors would be input into decisions that would be made concerning the channel size to achieve before going into the wet season.

Comment SED-47e

It has already been determined that passage is a problem in the first step. But if a significant storm event is not predicted, sluicing will not occur and blocked passage will continue to delay migration. **(Also FI-57e)**

Response

Storm prediction, especially for large events, is not an uncertain practice in which a sediment-producing event would be missed. However, the plan calls for entering the wet season ready for a range of sediment inflows that may occur. Also, as noted in the response to Comment 47b, other tools are available for sediment management if sluicing is not an option. The revised SOMP (Appendix J) provides a toolbox of options to control sediment in front of the fish ladder before a problem develops.

Comment SED-47f

Have 20 or more fish ascended the ladder in the past 2 days? Per our April 5, 2006, letter, NMFS believes the decision whether 20 or more fish have ascended the ladder is an arbitrary number. Please clarify how this number was determined to be a defining point to sluice or not. **(Also FI-57f)**

Response

We have eliminated this standard from the revised SOMP. The standard was developed based on an analysis of daily ladder counts at SCD from 1993 to 2004. The fish passage data indicate that when daily steelhead counts reached at least 20 fish, a series of days followed where counts were equal or higher. The objective of this standard was to avoid sluicing when potentially large numbers of adults were in the river downstream of SCD. Please refer to the revised SOMP.

Comment SED-47g

If this number of fish has ascended the ladder, sluicing will not occur even though a passage problem potentially will occur during the next storm event. This is a large number of steelhead to be trapped in the sediment delta without being able to move upstream. The impact of delay to these fish needs to be addressed. **(Also FI-57g, SED 47f)**

Response

We have removed this standard from the protocols. Please refer to the revised SOMP. Fish passage would be managed proactively using three tools, sluicing, dredging and trap and truck.

Comment SED-47h

Increasing flows likely to exceed 300 cfs? Future hydrologic conditions are very difficult to predict. Basing management decisions (when sluicing is to occur) on unpredictable occurrences is unacceptable. **(Also FI-57h)**

Response

Flow forecasting is used throughout California to predict reservoir releases, flood stage, and water supplies. Records are available for the Carmel River basin that would be used for flow forecasting including historic rainfall, streamflow, and meteorological conditions. Storms would be tracked using satellite imagery and rainfall, and streamflows would be tracked in real time. The MPWMD has good data on rainfall and streamflow relationships. Real time rainfall would be integrated into the predictions and validated with real-time flow data from gaging sites installed on the Carmel River in the watershed upstream of LPD and downstream of the confluence with Cachagua Creek. These stream gage data would be used to document flow conditions upstream of the SCD and the storm and rainfall data would predict if flows are expected to increase or decrease. These records would be used to build a predictive forecasting tool.

More importantly, the revised SOMP (Appendix J) is a proactive tool that does not require managers to wait until problems occur before responding. The intent of the plan is to start each migration season with fish passage and maintain passage throughout the year.

Sediment deposition would occur throughout the impoundment, and some of the deposition may occur near the entrance to the fish ladder. However, sediment management is structured to allow for sediment movement without resulting in closure of the ladder. As demonstrated at Daguere Dam on the Yuba River, sediment can flow over the dam without closing the fish ladders.

Comment SED-47i

Storm precipitation predicted to be significant? Please refer to comment above. Although predicting storm events is becoming easier, storm intensity is unknown until the storm is actually occurring. **(Also FI-57i)**

Response

Please refer to response to Comment SED-47h.

Comment SED-47j

Is flow still increasing past 300 cfs? How long does it need to keep increasing past 300 cfs? This is unpredictable. **(Also FI-57j)**

Response

It is not necessary to predict how long or how far a storm will increase to initiate implementation of sediment management measures under the revised SOMP. Once flows pass 300 cfs, actions may begin. The comment suggests that sediment management is flow-based; however management actions would be undertaken whenever sediment has built up to the point that it may impede fish passage. Proper dry season management would assure that fish passage is present and that the anticipated wet season sediment deposition can occur without eliminating passage. The 300 to 800 cfs is a suggested range for sluicing, if it is needed. The SOMP does not depend on a set duration past 300 cfs to continue the actions. The modeling assumed 300 cfa for two-hours.

Please refer to response to comment SED-47h regarding the unpredictability of storms.

Comment SED-47k

Continue sluicing until time limit, incision goal, or flow limit is reached. What is the time limit for sluicing? Please clarify how channel depth and width within the reservoir will be measured during the high flow season in order to determine that enough sediment has been sluiced to provide for passage. What is the flow limit? **(Also FI-57k)**

Response

The revised SOMP presents a toolbox of management actions to maintain fish passage at the entrance to the ladder. These tools are not time-dependant but rather depend on sediment inflow and deposition during the wet season and the subsequent need to remove a blockage that may have formed. Assessing the presence of sediment near the fish ladder during the wet season is addressed in the revised SOMP (Appendix J).

Comment SED-47l

If flow is not increasing past 300 cfs, abort, re-open fish ladder. How many aborted sluicing events will occur causing unnecessary delay to fish migration throughout the season due to the inability to predict hydrologic events to induce sluicing? **(Also FI-57l)**

Response

Regarding predictability, see response to Comment SED-47h. The objective of the revised SOMP is to manage sediment in the dry season to avoid aborted sluicing events causing unnecessary delays to fish migration. Please refer to this Final EIR/EIS Section 4.4 for a discussion of delays in migration.

Comment SED-48

Referring to page 2-38, NMFS expects sluicing will have long-term (not short-term) significant and unavoidable effects on suspended sediments and riverine sediment storage. Sluicing may have effects for a short time during the season, but sluicing, and its effects, will occur every year in perpetuity. Thus, NMFS expects long-term effects.

Response

Please refer to Sections 4.2 and 4.4 of this Final EIR/EIS, and the revised SOMP (Appendix J), for updates addressing this comment. Sluicing effects will continue over the long term, but are considered less than significant. At a given moment, the outflow sediment pattern may be different than the inflow pattern because of temporary storage and subsequent sluicing of this material. Modeling of the sluice event showed that the sediment released to the lower river would dissipate rapidly to background conditions (please refer to Section 4.2 of this Final EIR/EIS).

Comment SED-49

Referring to pages 4-34, 4-87, 4-137, 4-139 and page 8 in Appendix I: There is confusion as to the actual amount of sediment released, the duration period of a sluicing event, and the number times annually sluicing would occur. Page 4-34 states sluicing would occur for 2 to 4 hours to release 2 to 4 AF; page 4-87 states as much as 4.5 AF will be released over a 3 to 8 hour period and would occur once or twice a year; page 4-137 states 2 to 3 AF will be released over 1 to 4 hours; page 4-139 states sluicing will occur 2 to 3 times per year; and page 8 of Appendix I states 4.5 AF would be released over 8 hours. Appendix I (page 9) also states sediment would redeposit near the fish

ladder depending on flow, in 5 to 20 days, requiring sluicing to begin again. The Final EIR/EIS should analyze the correct figures and be consistent throughout the document.

Response

Please refer to Sections 4.2 and 4.4 of the Final EIR/EIS, and the revised SOMP (Appendix J), for updates addressing this comment. The revised SOMP clarifies and provides additional information regarding the theoretical number of sluicing events based on historic flow. A two-hour sluice event at 300 cfs would release about 2.4 AF of sediment.

June 28, 2006 letter from Jim Crenshaw / California Sportfishing Protection Alliance

Comment SED-50a

The technical design for "sluice gates" required for both the Proponent's Proposed Project (PPP) and Alternative 1, is inherently flawed for several reasons. First, relying on the sluice gates as the primary method of sediment management will lead to significant unintended consequences caused by ongoing release of the sediments to prevent future build-up of sediment above the dam structure.

Response

It is not clear what the technical design flaw is referenced in the comment. The sluice gate concept was developed by a professional engineer registered in California and sluice gates are present in other reservoirs and canals in California.

Please refer to the revised SOMP (Appendix J), for updates addressing this comment. The SOMP does not rely entirely on sluicing. Sluicing of sediment is one of several methods to control sediment that may collect at the upstream opening of the fish ladder. It is an adaptive management plan that would provide the flexibility of implementing other sediment management techniques if sluicing is not possible due to flow regimes or fish migration. This approach would minimize unintended consequences.

Sediment transport is a natural feature of any watershed and is controlled by the hydraulic characteristics of the river at different flows. The ongoing release of sediments would occur under any of the alternatives, including the No Project alternative, as noted in the response to comment SED-18.

Comment SED-50b

The continuous release of sediment will result in impacts to water quality, will continue to cause degradation of habitat downstream of the dam site, and will assure that present trends in scouring just below the dam structure will also continue to occur.

Response

Please refer to Sections 4.2 and 4.4 of this Final EIR/EIS, and the revised SOMP (Appendix J), for updates addressing this comment. The downstream release of sediment stored near the fish ladder would temporarily increase sediment loads to the lower reaches of the river. This process adds sediment to the river, contrary to the historic depletion of downstream sediment. Modeling indicates that the downstream increase in sediment load would be of short duration and limited aerial extent. The planned release of sediment would not increase scour.

April 5, 2006 letter from Dick Butler / NOAA's NMFS

Comment SED-51

The Mussetter Report indicates sluicing would need to occur every 5 to 20 days in order to achieve sediment continuity, while the O and M Plan indicates sluicing will only occur once or twice a year. On average 16.5 AF of sediment is delivered to the reservoir each year. However, sediment delivery events are, on occasion, the result of significant stochastic events (i.e., as a result of the Marble Cone fire in the head waters of the Carmel River an estimated total of 800 to 1000 AF of sediment was deposited behind San Clemente dam). The buttressing alternative (without sluice gates) model reported an average of 12.2 AF of sediment passing over the dam (when run for 41 years into the future). The remaining sediment (4.3 AF) would continue to build up behind the dam. This is likely why the O and M Plan only plans to sluice 4 AF of sediment each year. However, sluicing can potentially dump 9.5 to 10 AF in 24 hours, which equates to approximately 60 percent of 16.5 AF and 80 percent of the 12.2 AF passing over the dam if buttressed. Therefore, 6.5 AF will accumulate in the reservoir under the O and M Plan and 4.3 AF will accumulate under the buttressing alternative (without sluice gates). Consequently, NMFS believes the estimates in the O and M Plan are incorrectly based on the need to sluice 4.3 AF annually from the reservoir and as a result, they plan to release too little sediment to maintain fish passage to the upper river. Over time, the proposed sluicing will be inadequate to handle incoming sediment loads and there are no contingency plans for stochastic sediment delivery events.

Response

Please refer to Sections 4.2 and 4.4 of the Final EIR/EIS, and the revised SOMP (Appendix J), for updates addressing this comment. Because other techniques are available to remove sediment from the entrance of the fish ladder, the frequency of sluicing may reduce further from the estimates described in the revised SOMP that were based on the historical hydrology.

It is not clear why the commenter believes that too little sediment would be released to maintain fish passage. The SOMP is not based on a need to sluice 4.3 AF of sediment or any other specific amount. The purpose of the SOMP is to maintain fish passage from the fish ladder through the remnant pool to the upstream channel and it provides methods to control sediment proactively. The numerical methods used in developing the

plan suggest that the sediment can be removed and the procedures described in the plan would be adaptive and change according to data collected from previous years. The quantity of sediment to be managed in any year would vary depending on the hydrologic conditions during the previous wet season and the amount of storage in the remnant pool. This amount can vary from 0 AF to 2.4 af (the quantity of sediment released from a 2 hour sluice at 300 cfs). Modeling results indicate that a sluice event could keep the remnant pool open under wet-year and dry-year conditions by controlling the water surface elevation in the pool.

"Stochastic events" may refer to large sediment inflows from soil erosion after a fire or other land disturbance, landslides, or mass wasting. Such an inflow occurred following the Marble Cone fire and resulted in a rapid filling of the reservoir (800 to 1,000 acre-feet of sediment as stated in the comment). This sediment inflow was several times larger than the annual background sediment load. Elevated sediment inflow remained for several years after the fire. Modeling of a dam removal alternative conducted for the RDEIR (2000) assumed that the dam would be removed and the stored sediment would be left in place for the river to convey downstream. This would produce a situation similar to the sediment influx following a large fire or landslide. The results of that modeling indicated that significant impacts (to fish and flooding) would occur if the stored sediment currently in the reservoir were left in place and the river allowed to convey that sediment downstream. If the dam were left in place, San Clemente Dam would retain from 9 percent to 22 percent of the sediment generated from such a stochastic event, reducing the sediment impact to the river.

Comment SED-52

NMFS is concerned that the O and M Plan lacks a comprehensive analysis and provides no assurances for abnormal conditions or even conditions 5 years from now. There are no contingency plans for drought or above average rainfall events or for episodic sediment delivery (i.e., wildfire and resulting sediment delivery which is a fairly predictable occurrence in the chaparral vegetation community in California). All reasonably expected conditions (wet years, dry years) needed to be realistically evaluated in terms of the totality of their potential impacts. The EIR/EIS needs to analyze the effects that will occur between the uppermost point of the reservoir incision channel to the ocean. There is also uncertainty about who will make the decision to sluice, which needs to be clearly vetted. NMFS also expects mechanical problems with the sluice gates at some point in the next 100 years to create conditions that cause the fish ladder to be disconnected from the reservoir thus a contingency plan will need to be developed for this circumstance.

Response

Please refer to response to comment SED-51 for a description of sediment flows from large events such as fire.

The potential for fire or other upper watershed perturbations may occur regardless of the alternative selected and is the same for all alternatives. However, the potential for hillslope failure would probably be greater in the current impoundment area if dam were removed exposing hillslopes that have been under water and sediment for 86 years. Alternatives 1, 2, and 3 would pose greater risks of large sediment releases and impacts to the Carmel River than would the Proponent's Proposed Project.

Please refer to Sections 4.2 and 4.4 of the Final EIR/EIS, and the revised SOMP (Appendix J), for updated information addressing this comment. The revised SOMP describes how the decision to sluice would be made and addresses the decision-making process for responding to mechanical failures of the sluice gates or unforeseen events. The sluice gates may be operated manually under emergency conditions.

Comment SED-53

Page 3, second paragraph, is where 'one or two sluicing events per year for several hours' is proposed, and demonstrates a significant inconsistency between the O and M Plan and the Mussetter Report.

Response

Please refer to the revised SOMP (Appendix J), for updated information addressing this comment. The revised SOMP provides a description of the types of sediment management activities and the frequency of the activities. The MEI report modeled sluicing in general terms for the purposes of determining if sediment can be removed from the reservoir through a gate and how far upstream the effects of sluicing would be felt. It did not determine the final operating conditions for sluicing.

Comment SED-54

Page 7, last paragraph: NMFS is extremely concerned by the language used in this section. To indicate that "(i)t (sic) is not possible to predict the suspended sediment load or turbidity levels from the modeling data" is unwarranted because the figures provided in the Mussetter Report were based on these data. Statements such as this call into question the analyses used, and interpretations of results, here and elsewhere in the EIR/EIS.

Response

Please refer to Sections 4.2 and 4.4 of the Final EIR/EIS, and the revised SOMP (Appendix J), for updated information addressing this comment. The MEI report was used to assess sediment transport under the various project alternatives and includes suspended sediment concentrations (MEI 2007b).

Comment SED-55

Sediment and Turbidity section: This section needs to include an analysis of sediment pulse routing downstream and an analysis of such pulses on fish and habitat. Without

these analyses, NMFS has little confidence in any interpretations provided in the EIR/EIS. For example, the additive effects of sediment pulses were not considered. Pulses of sediment can accumulate in low gradient sections of stream and create adverse cumulative effects beyond the individual releases.

Response

Please refer to Sections 4.2 and 4.4 of the Final EIR/EIS, and the revised SOMP (Appendix J), for updated information addressing this comment. The sediment transport modeling analyzed the movement of sediment in the lower Carmel River for the alternatives.

It is not clear what is meant by "the additive effects" of sediment pulses. The modeling uses a 41-year hydrologic record for the simulations and therefore covers many types of water years (wet, dry, floods, drought). The movement of sediment downstream through a long-term, diverse hydrologic record is addressed in the modeling.

Sediment released through a sluicing event would not be transported as a cohesive unit nor would it travel downstream as a unified "pulse." Instead, sediment released through a sluicing event would disperse rapidly downstream (see Section 4.2 of the Final EIR/EIS for a discussion of modeling results).

The Carmel River would transport sediment based on the transport capacity of the river. If sediment is released through a sluicing event, it would combine with the background sediment load that is flowing over the dam, therefore increasing the total sediment load that must be transported by the river. If the total sediment load exceeds the river's transport capacity at the current flow, the excess would drop out along the river. Or, more likely, it would never leave the plunge pool. If the combined sediment load is less than the transport capacity, the river would pick up sediment through erosion of the bed and banks downstream of the dam (as is currently occurring). These conditions were simulated in the sediment transport modeling described in Section 4.2 of the Final EIR/EIS.

Comment SED-56

In Alternative 4, sluicing seems to be part of this alternative, but it is not addressed in the same fashion as the Proponent's Preferred Project or Alternative 1. It should be addressed in the same fashion and the effects determination should be the same for both. There are several instances where the effects between the No Action Alternative and the Proponent's Preferred Project are the same in their description, but different under the effects determination. **(Also FI-98)**

Response

In the Draft EIR/EIS, sediment management, including sluicing, was considered part of Alternative 4 (No Project), but these actions have been removed from Alternative 4 in the Final EIR/EIS so that the No Project description conforms more closely with the

intent of a No Project (No Action) alternative under NEPA and CEQA and to be consistent with the NOP (see the Final EIR/EIS Section 3.6).

July 3, 2006 letter from Robert Floerke / California Department of Fish and Game

Comment SED-57

As presented in Appendix J, sluicing operations are untested and lack specificity. They are based on migration records and behavioral observations of an already residual run and do not attempt to model the population recovery that the resource agencies believe should be a primary objective of the project. They do offer an interesting projection based on admittedly the most accessible, rather than effective, data collection methods (e.g. the use of the Robles Del Rio gage 5 miles downstream of the dam rather than the Sleepy Hollow gage). While the plan strives to identify permutations that would minimize the concurrence of sluicing and migration, the complexity of variables appropriately identified in the "Proposed Sluicing Decision Tree" (Figure 3) belies the inherent difficulty in juxtaposing the need to remove sediment from the reservoir and improve fish passage. The draft plan appears to fail to consider in detail predictable outliers to watershed conditions experienced from 1994 to 2005, such as fire, drought or prolonged heavier flows, which would alter debris loading, sediment particle-size distributions and vegetative encroachment in the reservoir. The adaptive management aspect of the plan appears to be traditional dredging that would occur at the upstream end of the fish ladder "on average every three years." If heavy storms and high flows are prevalent, this dredging would be precluded, making historically productive wet years the most impacted.

The experience of the last two decades with maintenance issues at the fish ladder amply illustrate the difficulties in achieving resource management priorities particularly during storm events. We are confident that CAW will do their best to comply with all aspects of the Sluicing Operations and Maintenance Plan that is still to be developed, but are concerned that the full implications of the can be fully understood so must be evaluated as an unknown. By design, sluicing will need to happen more or less concurrently with the adult migration of steelhead in the Carmel River. The document correctly identifies the impacts of the sluicing to fisheries and water quality as significant and unavoidable (Table 2.1, Impacts FI-9 and WQ-14). **(Also FI-101)**

Response

The project need is to provide safety and recovery of fish populations is not within the scope of this EIR/EIS. All alternatives affect fish, and each includes mitigation measures necessary to maintain fish passage and mitigate significant impacts.

Please refer to Sections 4.2 and 4.4 of the Final EIR/EIS, and the revised SOMP (Appendix J), for updates addressing other parts of this comment. The process of releasing sediment past a dam either through an orifice or over a spillway is not untested. An orifice release of sediment is commonly used at dams with hydroelectric

facilities to keep the penstocks and turbines free of sediment. Dams such as Daguerre Point Dam on the Yuba River and Sunol Dam on Alameda Creek are filled with sediment and the sediment inflow currently passes over the Dam to the downstream river. Daguerre Dam Point has two active fish ladders and sediment is periodically dredged from the upstream end of the ladders to maintain fish passage. Sluicing of sediment at the Robles Diversion Dam on the Ventura River is proposed as part of the Matilija Dam Removal Project as a means of keeping the diversion dam free of sediment.

Under the SOMP, sediment management would be employed to keep the area at the entrance to the fish ladder free of sediment that may otherwise restrict the movement of fish in or out of the ladder. The revised SOMP would manage sediment primarily before the wet season and therefore sediment management activities should not occur when fish are present.

Please refer to the response to comment SED-51, above, for a description of the response to events such as fire. The revised SOMP describes the toolbox of methods for sediment management during different year types. It also describes the need to establish the fish passage conditions prior to the onset of the wet season, thereby reducing the chance that sediment management activities would coincide with adult migration.

NOTE: COMMENTS SED-58 THROUGH SED-65 CORRESPONDS TO MAY 23, 2006 PUBLIC HEARING TESTIMONY

Comment SED-58

Jonas Minton/Planning and Conservation League Environmental Advocacy Organization

There are a few impacts that we think have not yet been addressed. The first is some of the problems with the dam strengthening and notching that we don't think are fully evaluated, and that includes the potential for sediment scour from the silted-in reservoir in a high-flow event, and that could mobilize; that is to say, carry down a lot of sediment to the downstream areas impacting both fish and residents.

Response

The effect of the Dam on the river is an existing condition; it is not an impact of the project. Transport of sediment downstream during a high flow event is not affected by the project; under the No Project Alternative, these conditions would occur. Over the long term, sediment movement past the Dam under the Proponent's Proposed Project (dam strengthening) and Alternative 1 (Dam Notching) would approach the sediment movement under the two dam removal alternatives. That is, it would approach the level of sediment inflow. The potential for downstream impacts is addressed in impact statements WR-2a, WR-2b, WR-4a, WR-5, and WR-6.

Comment SED-59

Jonas Minton/Planning and Conservation League Environmental Advocacy Organization

We think that additional attention needs to be placed on the difficulties of sluicing from either the dam strengthening alternative or the notching alternative. How do you sluice at the same time you maintain fish passage? The time that you want to sluice is when the fish want to out-migrate. **(Also FI-A)**

Response

Please refer to Sections 4.2 and 4.4 of this Final EIR/EIS, and the revised SOMP (Appendix J), for updates addressing this comment. The revised SOMP describes how sluicing would occur while maintaining fish passage. The goal of sediment management is to maintain fish passage and proposes to accomplish it proactively, rather than waiting until a problem develops before responding.

Comment SED-60

William Look/California Trout

It appeared to me that looking at the river holistically, some attention ought to be made to recharging downstream gravels.

Response

The issue of recharging downstream gravel is addressed in Section 4.2 of this Final EIR/EIS through analysis of the sediment passing the Dam under the alternatives. The total amount of sediment stored in the lower river is summarized as part of this analysis. The effect of the Dam on the river is an existing condition; it is not an impact of the project. Also refer to response to Comments NEPA/CEQA-9 and NEPA/CEQA-10 for more information on replenishing sediment supply to downstream beaches.

Comment SED-61

Charles Franklin/Resident

What are the appropriate compensatory sediment flows. I mean you have been stealing gravel out of my backyard for a hundred years. Over how long a period of time, how much gravel should you be giving me back to kind of put us back to where we were a hundred years ago?

Response

The effect of the Dam on the river is an existing condition; it is not an impact of the project.

Comment SED-62

Roger Williams/Resident of Carmel-by-the-Sea

The issue is dams over the years in California have trapped sediment, which has had a negative impact on beaches. Many of the beaches up and down the state are diminishing. So I think if the bypass route is used, rather than entombing the sediment forever, a slow impact, as the previous speaker was talking about, over a hundred years of releasing some of that trapped sediment every year during the winter state would help reestablish some of the beaches. **(Also NEPA/CEQA-31)**

Response

Thank you for your comment. The effect of the Dam on the river is an existing condition; it is not an impact of the project. Investigating ways to replenish sediment supply to the downstream beaches is beyond the scope of this project. Also refer to response to Comments NEPA/CEQA-9 and NEPA/CEQA-10 for more information on replenishing sediment supply to downstream beaches.

Comment SED-63

Frank Emerson/Volunteer with Carmel River Steelhead Association

I really appreciated Mr. Williams' comment that over time we could recycle that cobble, because gravel injection is one of the mitigations suggested by the fisheries agencies. So there is more and more obviously apparent than that option to me.

Response

Thank you for your comment. The effect of the Dam on the river is an existing condition; it is not an impact of the project. Investigating ways to replenish gravel supply to the downstream reaches is beyond the scope of this project. Also refer to response to Comments NEPA/CEQA-9 and NEPA/CEQA-10 for more information on replenishing sediment supply to downstream beaches.

Comment SED-64

Rex Keyes/Resident of Salinas

My suggestion is gradual release of the sediment behind the dam. You can do that during a trial period, like this next winter. Release some of the sediment during high flow rates, which should deposit evenly downstream all the way to the ocean. And in the last 20 years we've had a lot of heavy rains. You've had a lot of sediment coming down, minor landslides occurring in the Carmel River, and this probably wouldn't be any more harmful than what occurs naturally. At the end of the winter you could measure the impacts and, if it's pretty successful, each year afterwards release more and more sediment until the dam is restored to what its normal operations used to be.

Response

As described in Final EIR/EIS Section 3.1, the RDEIR (Denise Duffy & Associates, Inc. 2000) evaluated an alternative that would have released sediment slowly over a 60 to 100 year period. This alternative was considered and eliminated due to its long-term effects on fish and water quality, due to its potential effects on flooding, and because the ability to control releases was not demonstrated. SCD was not originally constructed for water storage, but to provide a point of diversion on the Carmel River and head for gravity feed into the water system. The Dam continues to serve that original function.

Comment SED-65

Roy Thomas/Carmel River Steelhead Association

I am also well aware, as I'm sure you are too, of the years of starving of the lower river for gravel, and I support the concept of sorting and continually supplying sediment; i.e., sand, gravel and cobble to the river to maintain not only the height of the river and the beaches, but to help prevent bank erosion, which apparently that does, which you don't have down in sizing of the river.

Response

The effect of the Dam on the river is an existing condition; it is not an impact of the project. Investigating ways to replenish sand, gravel and cobble to the lower river is beyond the scope of this project. Also refer to response to Comments NEPA/CEQA-9 and NEPA/CEQA-10 for more information on replenishing sediment supply to downstream beaches.

Carmel River Steelhead Association Comments on San Clemente Environmental Impact Report

Comment SED-66

The EIR mentioned that there might be a temptation to reduce the flow to the fish ladder thereby reducing the need for more frequent sluicing. This would have a negative effect on fish passage. Large sediment sluiced to the plunge pool may pile up and block access to the fish ladder. This possibility was not examined.

Response

Please refer to Sections 4.2 and 4.4 of the Final EIR/EIS, and the revised SOMP (Appendix J), for updates addressing this comment. The flow through the fish ladder would be maintained to facilitate the movement of steelhead through the ladder. The point of sluicing on the rising limb of a hydrograph is to ensure that a buildup of sediment does not persist at the bottom of the plunge pool. No buildup of sediment in the plunge pool sufficient to block the entrance to the fish ladder is predicted to occur. The revised SOMP employs a variety of means to remove sediment and maintain the fish ladder.

Comment SED-67

Sediment removed from San Clemente should be available for sorting and reintroduction into the Carmel River for river habitat, bank stabilization, and beach nourishment. Sediment storage that allows for mitigation of the long-term damage caused by the dam should be considered in all options.

Response

Sections 3.3.4 and 3.4.4 of this Final EIR/EIS explain how sediment would be excavated and disposed of at Site 4R under Alternatives 1 and 2. Section 3.5.4 describes how it would be stabilized in place under Alternative 3. Although there may be many beneficial uses for the sediment, alternatives that provide beach nourishment or explore other uses of the sediment are not within the scope of this EIR/EIS. Also refer to response to Comments NEPA/CEQA-9 and NEPA/CEQA-10 for more information on replenishing sediment supply to downstream beaches.

The effect of the Dam on the river is an existing condition; it is not an impact of the project.

June 28, 2006 letter from Bob Baiocchi/Carmel River Steelhead Association

Comment SED-68

Sluicing sediment downstream in the Carmel River adversely affects water quality, steelhead habitat, macro invertebrate habitat, other aquatic resources, et al. California-American Water Company must comply with state water quality statutes in California like every other citizen and party. The sluicing of sediment from San Clemente Reservoir and Dam into the Camel River must be prohibited at all times by the US Army Corps of Engineers, State Regional Water Quality Control Board, State Water Resources Control Board, Department of Fish and Game, NOAA Fisheries et al. Cal-American Water Company must remove all sediment by mechanical methodologies to protect the federally protected steelhead trout and their habitat, aquatic environment and water quality of the Carmel River below the San Clemente Dam to the Pacific Ocean, including the Carmel River Lagoon.

Response

CAW will at all times comply with pertinent laws and regulations, and with all permit conditions placed on the selected alternative by the resource agencies.

Comment SED-69

It is well known that dams prevent the downstream recruitment of spawning gravels for downstream spawning of resident and anadromous fisheries. In this case the San Clemente Dam is preventing the downstream recruitment of spawning gravel in a significant large portion of the streambed of the Carmel River that has adverse impacts

to spawning habitat of federally protected steelhead trout species in the lower Carmel River. **(Also FI-116)**

Response

The effect of the Dam on the river is an existing condition; it is not an impact of the project.

Comment SED-70

The draft EIR/EIS must include a Steelhead Trout Gravel Recruitment Plan for the lower Carmel River below San Clemente Dam in the event the removal of the dam is not ordered by any regulatory state and federal agency. **(Also FI-117)**

Response

The effect of the existing dam on sediment delivery to the downstream reaches is part of the baseline environmental condition. It is not an impact of the project. SCD nearly full of sediment and will soon be passing sediment downstream. For that reason, all alternatives, including the Proponent's Proposed Project and the No Project Alternative (Alternative 4) would result in sediment being transported past the Dam within the next 6 to 10 years.

June 30, 2006 letter from Mindy McIntyre/Planning and Conservation League Foundation

Comment SED-71

The technical design for "sluice gates" required for both the Proponents Proposed Project (PPP) and Alternative 1, is inherently flawed for several reasons. First, relying on the sluice gates as the primary method of sediment management will lead to significant unintended consequences caused by ongoing release of the sediments to prevent future build-up of sediment above the dam structure. The continuous release of sediment will result in impacts to water quality, will continue to cause degradation of habitat downstream of the dam site, and will assure that present trends in scouring just below the dam structure will also continue to occur. **(Also FI-119)**

Response

Please refer to response to Comment SED-50a and SED-50b.

Comment SED-72

It is very possible, if not likely, that they will be ineffective or fail to reduce the silt buildup behind the dam to an acceptable level.

Response

Comment noted. Sediment is not unnaturally introduced into the river by sluicing; sediment transport is a natural feature of the watershed. The revised SOMP is designed to maintain passage at the fish ladder.

Comment SED-73

Complete sediment removal remains a large problem when considering the dam buttressing and notching alternatives; it is thought by many that the sluice gates will not force larger pieces of sediment downstream, leaving their entire effect on sediment removal to be negligible, failing to restore the necessary variable elements of normal sediment flow including gravels and cobbles essential for wildlife stream habitat restoration.

Response

The effect of SCD on the river is an existing condition; it is not an impact of the project. Currently, San Clemente Reservoir has a 35 percent sediment trap efficiency (35 percent of the incoming sediment load is retained). This is anticipated to decline to 22 percent after the reservoir fills with sediment. Complete sediment removal is not proposed under the Proponent's Proposed Project (dam strengthening, or buttressing) or Alternative 1 (dam notching). Therefore, the reservoir does not now nor would have complete sediment removal. Sediment transport modeling results indicate that at first finer material would dominate the sluiced sediment, but as sluicing continues, the gravels located upstream of the fish ladder would be transported downstream.

TERRESTRIAL

WRITTEN COMMENTS RECEIVED

May 24, 2006 letter from Don Redgwick

Comment TE-1

A dam will support wild life and migrating birds.

Response

Thank you for your comment. Comment noted.

May 24, 2006 letter from Don Redgwick

Comment TE-2

None of the options will protect the habitat of the Red Legged Frog completely, but the habitat can be moved and recreated without harm to the frogs. Enlarging the lake by removing the silt will enhance the fish and bird habitat. **(Also FI-1)**

Response

Thank you for your comment. Comment noted. The concern is that "moving" habitat would mean eliminating existing habitat, which always has the potential to result in impacts to the species present. Over the long-term, all of the action alternatives will maintain or increase the amount of habitat for the CRLF. The effects of the alternatives on the CRLF and birds are discussed more fully in Section 4.5 (Vegetation and Wildlife).

Comment TE-3

The program to protect the Red Legged Frog and the Steelhead should be adequate for its purpose, but should not impact a common sense approach that recognizes the cost, water resource, disruption to neighbors and other environmental issues. **(Also FI-2)**

Response

Thank you for your comment. Comment noted.

June 4, 2006 letter from Don Redgwick

Comment TE-4

If the realignment is permanent doesn't that significantly reduce the dam safety and steelhead issues and allow the dam to remain for the benefit of frog, bird, lake fish, and other wildlife habitat?

Conversely if the Carmel River is rerouted on a permanent basis and the San Clemente Dam is left in place with or without a buttress, would that provide a superior habitat for frogs, birds, lake fish and other wild life? **(Also AA-7 and FI-3)**

Response

If selected, the Carmel River Reroute and Dam Removal (Alternative 3) would be permanent. All of the action alternatives would meet dam safety standards. An analysis of potential impacts (including beneficial ones) to fish and wildlife is provided in sections 4.4 (Fisheries) and 4.5 (Vegetation and Wildlife). A summary of potential impacts is provided in Section 2.3 and in Table 2.1. Please also refer to responses to comments AA-7 and FI-3 which address similar issues.

Comment TE-5

If the dam is removed and the sediment is grouted, will that make a satisfactory habitat for the Red Legged Frog? Will a grout be used to stabilize the sediment? If a grout is utilized for containment will that provide a suitable habitat for frogs and other wildlife? **(Also AA-7)**

Response

Grout will be used to stabilize the exposed face of the sediment, similar to a retaining wall. Native vegetation providing wildlife habitat could establish on the sediment plain behind this face. **(Also TE-7)**

June 6, 2006 letter from John W. Fischer

Comment TE-6

To make red legged frog habitat, will it be similar to wetlands, even with the grouting? What are the chances that, even if the sediment is thoroughly mixed before spreading, toxin levels will not affect any frogs which takes up residence there?

Response

We are not aware of any published research that indicates that set grout would produce toxins that would affect frogs. **(Also TE-5 and TE-7)**

June 13, 2006 letter from John G. Williams, Ph.D.

Comment TE-7

The DEIR does not adequately address the main long-term differences among the alternatives. The reinforcing and notching alternatives will leave a large amount of alluvial riparian habitat upstream from the dam. The removal and by-pass alternatives will not, but will result instead in more canyon habitat and upland habitat. There are real trade-offs between these, but the DEIR does not present the long-term consequences of the alternatives clearly enough to allow an informed choice among them. Presenting such an analysis would require some thought and effort, but it does not seem impossible. Generally, the analysis could be based on evaluations of habitats in the basin that are similar to the expected final results of the alternatives. For example, the channel upstream from the San Clemente Reservoir could be taken as a proxy for the habitat that would be restored by the dam removal alternative. For the reinforcing and

notching alternatives, analysis could be based on existing alluvial habitat in the upper valley, or from a projection of the developmental trajectory of the habitat that now exists in the filled portions of the reservoir.

Response

The cutoff beneath the diversion dike will be placed for maintaining the foundation stability of the dike; however, the diversion dam for the reroute alternative (Alternative 3) is permeable. The intention is to allow seepage that will maintain a high water table in the area downstream of the diversion, so that habitat for riparian species such as the CRLF will persist. We agree that there are tradeoffs between alternatives. Table 2.1 provides a summary of these impacts for comparison. **(Also TE-31, AA-43, and WET-5)**

June 30, 2006 letter from Trish Chapman / California Coastal Conservancy

Comment TE-8

Depending on the findings of the hydrology and water resources impact analysis, additional impacts may need to be analyzed including impacts to riparian habitat along San Clemente Creek as a result of channel bed or bank erosion caused by changes in hydrology.

Response

Sediment would be removed from the channel of San Clemente Creek up to the reroute confluence, which would result in the removal of riparian vegetation in this reach of San Clemente Creek. Impacts to riparian habitat along San Clemente Creek that could result from the construction of Alternative 3 are discussed in Section 4.5.3 of the Final EIR/EIS. See also responses to HY-2 and HY-3.

Comment TE-9

Depending on the findings of the hydrology and water resources impact analysis, additional impacts may need to be analyzed including impacts to the wetland and riparian habitats if the groundwater elevation drops along the reach of the Carmel River that is to be abandoned.

Response

The diversion dike for Alternative 3 has been designed to be permeable. In conjunction with the slope stabilization design described in Section 3.5, this dike design is intended to maintain groundwater elevations in the abandoned reach of the Carmel River.

Comment TE-10

Section 4.5 Vegetation and Wildlife, All impact discussions. The determination of impact significance should include a temporal element as it does in the other impact

discussions. That is, impacts that are temporary, lasting through part or all of the construction period, should be differentiated from those that will extend beyond the construction period.

Response

Impacts that apply to multiple alternatives have the same timeframes. In the Final EIR/EIS, the temporal element for all impact issues, and throughout Chapter 4, would be either short-term or long-term. The temporal element has been identified for each impact issue and each alternative. They are also summarized in Chapter 2, Table 2-1.

Comment TE-11

Issue VE-4: Indirect Effects on Native Vegetation. The fifth paragraph of the mitigation section on page 4-194 addresses revegetation of cut slopes, fill areas, etc. It states that, "If non-natives are included in the seed mix, these would be species known not to be invasive or persistent." Non-natives should not be included in the seed mix under any conditions.

Response

As indicated in Section 4.5.3, native species are preferred for revegetation. However, native materials are not always available in the quantities needed for a project. The availability of seed can be affected by non-project events that result in a high demand for local native seed.

Cut slopes, fill areas, denuded areas, and any other areas where existing vegetation cover would be removed outside the roadway would be revegetated with an appropriate seed mix. This seed mix would be selected with the assistance of a qualified revegetation specialist with demonstrated experience and expertise in revegetation, and would contain native species that are indigenous to the project area. If insufficient native seed is available, non-natives may be included in the seed mix. Such non-native species would be species known not to be invasive or persistent. The seed mix would contain native species known to compete well against invasive non-native species.

June 29, 2006 letter from David A. Berger / Monterey Peninsula Water Management District

Comment TE-12

Page 4-211, first paragraph. "Construction activities could result in loss of 663 acres of oak woodlands protected by the Monterey County Oak Protection Ordinance in the area mapped in 2005." However, Table 4.5-1 states that only 66.4 acres of oak woodlands may be affected by dam removal.

Response

Thank you for drawing our attention to this discrepancy. The 663 acres expressed in the Draft EIR/EIS was incorrect. However, in response to comments on the Draft EIR/EIS,

we also revised the footprint of the sediment disposal site, reducing the actual amount of oak woodlands potentially impacted under Alternative 2 (Dam Removal) to 26.3 acres as shown in Table 4.5-1 in this Final EIR/EIS.

Comment TE-13

Page 4-211, fourth paragraph. "The acreage of vegetation cover type that would be lost as a result of Alternative 2 implementation is provided in Table 4.5-1. The total acreage of vegetation that would be lost in the area mapped in 2005 is 131 acres." However, Table 4.5-1 shows that the total vegetation that may be affected is 140.4 acres. Are these numbers supposed to match?

Response

In the Draft EIR/EIS, the affected acreages shown in Table 4.5-1 included open water, which gave an incorrect impression of the number of potentially affected acres. In the Final EIR/EIS, the acres discussed in the text, as well as the acreage depicted in Table 4.5-1 do not include open water. Some of the numbers of potentially affected acres have also been recalculated based upon the need to revise the footprint of the sediment disposal site in response to another comment. The total number of acres of vegetation that would potentially be affected under Alternative 2 would be 61.4 acres (excluding open water) as referenced in Section 4.5-3.

Comment TE-14

What guidelines and/or conditions are proposed to ensure replacement of riparian vegetation and other mitigation associated with the construction of the Tularcitos Access Road?

Response

As discussed in Section 4.5.3, the riparian forest would be revegetated at a 3:1 ratio for trees removed, including the cottonwood-sycamore riparian forest below SCD at the plunge pool staging area and access road, as well as any riparian species disturbed at the site of the right abutment wall, and any loss of riparian vegetation at the Tularcitos Access Route site.

Comment TE-15

If the re-route alternative is selected, demolished dam debris should be covered with native material to give the area a more natural look and provide a medium for vegetation to establish.

Response

As described in Section 3.5 (Alternative 3), demolished dam debris retained at the Project site would be incorporated into the sediment disposal site. Topsoil that had been separately stock-piled would be spread over the surface, and the site would be revegetated with native plants and trees obtained from the site vicinity.

June 15, 2006 letter from Pam Krone-Davis/RisingLeaf Watershed Art

Comment TE-16

What is the best use of the area behind the dam? Could it become a flood plain? Could it become a meadow? Could it become a marshy area and habitat for birds, frogs, etc? What is the best use of this area both from an ecological point of view and from a human use point of view?

Response

There are likely to be ecological trade-offs with each alternative. For example, see response to Comments TE-5, TE-7, TE-9, TE-31, TE-32, and TE-33.

Comment TE-17

How could trees and vegetation be planted and used to stabilize the sediment? What natural plants and trees could stabilize the sediment and at the same time provide the best habitat for red-legged frogs or for migrating and local birds?

Response

Vegetation alone would not be adequate to stabilize the sediment for Alternative 3. For additional information regarding vegetation, see responses to Comment TE-7 and TE-15. Issue GS-4 (Soil Erosion) in Section 4.1.3 discusses the Best Management Practices that would be implemented to stabilize the sediment.

June 30, 2006 letter from Patricia Sanderson Port/U.S. Fish and Wildlife Service

Comment TE-18

Page 4-173, Paragraph 4: The DEIR/EIS indicates that habitat loss is not a threat to California red-legged frog populations in central California. We respectfully disagree with this assertion. The recovery plan for the subspecies (Service 2002) refers to habitat loss and alteration as primary factors that have negatively affected the subspecies throughout its range.

Response

This comment has been addressed by citing the USFWS recovery plan for this species in Section 4.5.1 of this Final EIR/EIS.

Comment TE-19

Page 4-174, Paragraph 1: The discussion of interactions between California red-legged frogs and bullfrogs (Rana catesbeiana) presented in the DEIR/EIS is not accurate in the context of the proposed project area. The Barry (1999) reference cited in the DEIR/EIS relates to Butte County, which is at least 200 miles from the project area and is not along the California coast.

Response

We are aware of sites at which California red-legged frogs and bullfrogs appear to co-occur in seemingly stable numbers in several areas of San Mateo, Marin, Contra Costa, and Sonoma Counties. While those sites are not near Monterey County, many of them share similar climatic and hydrologic regimes. Both species occur along the Carmel River, and evidence presented by Jennings and Hayes (1985) strongly suggests that they have coexisted for more than 100 years. At sites in Marin and San Mateo counties, bullfrogs were observed to decline to near-extirpation when aquatic and riparian habitat was allowed to revert from agricultural use to a near wild condition, and red-legged frogs became the dominant frog species. Ecological theory holds that exotic species are never as well adapted to undisturbed habitat as are natives. A corollary is that exotics do best in disturbed habitat, such as San Clemente Reservoir and the river downstream of the dam. In our experience, if habitat is sufficiently disturbed, native species may depart regardless of interactions with exotics.

Section 4.5.1 of the Final EIR/EIS has been revised to address this comment.

Comment TE-20

The Department is unaware of any locations in or near Monterey County where "California red-legged frogs and bullfrogs co-occur in stable relative numbers," as stated in the DEIR/EIS (Page 4-174, paragraph 1).

Response

Refer to response to comment TE-19. Section 4.5.1 of this Final EIR/EIS has been revised to address this comment.

Comment TE-21

California red-legged frogs and bullfrogs have never been documented to co-occur in stable relative numbers in the Carmel River watershed, and proliferation of bullfrog populations along the central California coast (e.g., Monterey County) are a substantial threat to the persistence of the California red-legged frog in this area.

Response

Refer to response to comment TE-19. Section 4.5.1 of the Final EIR/EIS has been revised to address this comment.

Comment TE-22

California red-legged frogs have been found on many occasions in the stomachs of bullfrogs that were collected in the project area.

Response

Page 4.5.1of the Final EIR/EIS has been revised to address this comment.

Comment TE-23

*The DEIR/EIS states "Surveys during the annual San Clemente Reservoir drawdowns found California red-legged frogs and bullfrogs co-occurring throughout San Clemente Reservoir" (*Section 4.5.1*).*

Response

Refer to response to comment TE-19.

Comment TE-24

According to survey data submitted to the Service, the number of bullfrogs detected in San Clemente Reservoir, over the referenced time period, has increased dramatically, while the number of California red-legged frogs detected by surveyors has substantially declined. These trends indicate that bullfrogs are gradually out-competing and displacing California red-legged frogs from San Clemente Reservoir.

Response

Text in Section 4.5.1 of the Final EIR/EIS has been revised to reflect this comment.

Survey data collected from 2003 to 2006 indicate that for both species, numbers fluctuate and shift among locations, possibly as a result of management activities. Bullfrogs consistently outnumber California red-legged frogs at the reservoir pool where specific habitat conditions favor that species. California red-legged frogs are doing well upstream and downstream; and bullfrogs are less numerous than native species downstream.

Comment TE-25

Page 4-174, Paragraph 4: The DEIR/EIS states "pond habitat within the Carmel River arm occurs up to the upstream end of the reservoir sediment bed, but spawning pools outside of the river channel are absent further upstream" (page 4-174, paragraph 4). However, systematic annual California red-legged frog surveys conducted between 2002 and 2006 have consistently documented California red-legged frog reproduction in side-channel and off-channel pools up to 1.5 miles upstream of San Clemente Reservoir.

Response

Thank you for the clarification. The cited text has been revised in the Final EIR/EIS.

Comment TE-26

Pages 4-174 and 4-175: The DEIR/EIS uses 1997 survey data to support the conclusion of absence of California red-legged frogs from several reaches of the Carmel River in the project area (e.g., page 4-174, paragraph 3; page 4-174, paragraph 5; page 4-175, paragraph 1).

Response

Text in the Final EIR/EIS has been added to include the most recent survey information available.

Comment TE-27

The 1997 survey data is outdated; please include updated information in the final EIR/EIS. For example, the DEIR/EIS states that no California red-legged frogs were found in lower Tularcitos Creek during surveys in 1997 (Page 4-175, paragraph 1). However, an adult California red-legged frog was observed in Tularcitos Creek downstream of San Clemente Drive in 2000.

Response

Refer to comment response TE-26. Text in Section 4.5.1 of the Final EIR/EIS has been revised.

Comment TE-28

Page 4-188: In its evaluation of effects of each alternative on wildlife species, the DEIR/EIS does not identify effects of the proposed project (i.e., dam thickening) on movement and dispersal of California red-legged frogs from upstream and downstream of the project area.

Please include the following information in the FEIR/EIS.

Dispersal of individual California red-legged frogs plays an important role in metapopulation dynamics and therefore, the persistence of populations. While California red-legged frogs can pass many obstacles, and do not require a particular type of habitat for dispersal, a potential dispersal route connecting aquatic habitat sites must be free of barriers (i.e., a physical or biological features that prevents frogs from dispersing beyond the feature) and of sufficient width.

California red-legged frogs spend considerable time resting and feeding in riparian and wetland vegetation when it is present. Most of the time, when they are not in the water or making overland excursions, individual California red-legged frogs can be found within two or three hops of the water, resting secretively and feeding on land underneath a canopy provided by herbaceous plants and a variety of moisture-loving softwoods such as willows.

Therefore, it is reasonable to conclude that moisture and cover provided by the riparian plant community provide suitable foraging habitat and may facilitate dispersal.

Designating or creating movement corridors for California red-legged frogs is problematic. However, when an obvious corridor exists between two occupied sites, California red-legged frogs are likely to use the route (Bulger et. al 2003). An example of

such an obvious corridor is the riparian zone along the Carmel River upstream and downstream of the San Clemente Dam.

For a species such as the California red-legged frog to disperse beyond the San Clemente Dam (i.e., upstream or downstream), an individual must ascend or descend extremely steep slopes on either river bank adjacent to either dam abutment. Even in the unlikely event that an individual California red-legged frog is able to negotiate this slope, its exposure to predation is greatly increased during this movement.

Although dispersal of individual California red-legged frogs in the project area has not been rigorously studied, it is reasonable to conclude that a structure such as the San Clemente Dam poses a substantial barrier to dispersal. If the dam is stabilized and reinforced in place as described in the proposed project in the DEIR/EIS, it is very likely that the dam will perpetually remain an obstacle to dispersing California red-legged frogs.

Response

San Clemente Dam was built within a steep, confined reach of the river valley. Although dispersal of individual California red-legged frogs in the project area has not been rigorously studied, San Clemente Dam may pose a barrier to dispersal. Revised text in Section 4.5.1 has been included in the Final EIR/EIS. We agree that alternatives that include dam removal may provide a beneficial impact to California red-legged frog dispersement beyond San Clemente Dam.

Comment TE-29

Page 4-197: In its analysis of effects of constructing and operating the concrete batch plant, the DEIR/EIS does not recognize any potential impacts to the CRLF. However, California red-legged frogs are known to occur in the Carmel River immediately adjacent to the proposed site for the concrete batch plant.

California red-legged frogs could be directly and indirectly impacted by construction and use of a concrete batch plant in this location. Constructing the concrete plant could result in destruction of upland habitat for the California red-legged frog, and any inadvertent spill of materials could lead to contamination of the Carmel River downstream of the project area

By choosing a different location of the concrete batch plant, or selecting an alternative that does not necessitate use of a concrete batch plant, the likelihood of these adverse effects on the California red-legged frog and its habitat could be reduced or eliminated

Response

Text in Section 4.5.1 of the Final EIR/EIS has been revised to address the comment.

Only one of the analyzed project alternatives requires the use of a concrete batch plant, the other four (including the No Project Alternative) do not. The batch plant itself is only a component of the Proponent's Proposed Project, which includes a number of additional elements necessary to the project. Please refer to this Final EIR/EIS Section 4.7.3, Issue AQ-4 for information on the batch plant. The batch plant requires a level area approximately 5 acres (about 218,000 square feet) in size with good road access in order to move in/out the larger pieces of batch plant equipment and aggregate materials. This limits possible sites for the batch plant to generally near Carmel Valley Road, and not up the canyon closer to the Dam due to mountainous terrain and narrow, winding access roads. There is a smaller site closer to the Dam, but it would not be large enough for large trucks to turn around. Thus, it is not technically feasible to locate the batch plant closer to the Dam. Also, the proximity of electric power lines may avoid the use of diesel generators for batch plant operation, thus avoiding emissions of NOX, CO, ROC, SO2, and diesel fine particulate (PM10). Please also see the responses to comments AQ-14, AA-13, AA-14, NOI-4, and VIS-1 located in Appendix E.

Comment TE-30

Pages 4-197 through 4-199: In its analysis of effects of creating the new Tularcitos Access Road, the DEIR/EIS does not recognize any potential impacts to the California red-legged frog. However, California red-legged frogs are known to occur in Tularcitos Creek and the Carmel River in the vicinity of the proposed new road alignment.

California red-legged frogs could be directly and indirectly impacted by construction, use, and existence of this new, permanent access road. Constructing this new access road would result in destruction of aquatic and upland habitat, alteration of Tularcitos Creek and Carmel River floodplains, and increased sedimentation of Tularcitos Creek and Carmel River downstream of the project area.

Tularcitos Creek is already known to be a primary contributor of sediment to the Carmel River. Construction in the riparian corridor and floodplain of Tularcitos Creek would likely increase its contribution of sediment to the Carmel River. This increased sediment load could, in turn, further degrade habitat for the California red-legged frog downstream of the project area. By using the existing paved access road (San Clemente Drive), which is owned by Cal-Am, the likelihood of these adverse effects on the California red-legged frog and its habitat could be reduced or eliminated.

Response

The most recent survey information available for California red-legged frog has been added to the Final EIR/EIS. Effects on special-status wildlife and their habitat would be mitigated through preconstruction surveys, rescue and relocation operations, predator control, and the development of other measures through consultation with regulatory agencies based on the survey results. In the Final EIR/EIS, additional text has been added to the mitigation section of Impact Issue WI-6: Tularcitos Access Road Improvements that addresses this comment.

The EIR/EIS explains the potential for the Tularcitos access road to have impacts on terrestrial resources. It will be used only for the Proponent's Proposed Project, while Alternatives 1, 2, and 3 will use existing access below the dam (following San Clemente Drive). This choice was made in part due to the greater potential impacts on terrestrial biology of the Tularcitos route. (In the Draft EIR/EIS, the discussion in Section 3.1.1, Access Alternatives, incorrectly indicates that Tularcitos will be used for Alternative 1; the discussion is revised as above).

See Section 4.5.3 Impact Issue WI-6: Tularcitos Access Road Improvements for a discussion of potential effects to special-status species, including California red-legged frog. This section begins with "Construction of the new Tularcitos access route could affect Monterey dusky-footed wood rat, coast horned lizard, pallid bat, California red-legged frog, …" and goes on to say "Damage to aquatic habitat could result from erosion and other sediment and rubble discharge into the Carmel River and possibly Tularcitos Creek." Mitigation measures in the SWPPP (Appendix K) and Protection Measures for Special Status Species (Appendix V) address erosion protection and this concern for California red-legged frog and other aquatic species.

Comment TE-31

Page 4-199: The DEIR/EIS concludes that maintaining the San Clemente Reservoir pool at an elevation of 525 feet would be beneficial to the California red-legged frog. However, as noted previously, biologists have documented a steep decline in the number of California red-legged frogs and a sharp increase in the population of bullfrogs while the reservoir has been maintained at this elevation since 2003.

As long as San Clemente Reservoir provides breeding habitat for bullfrogs, increased numbers of bullfrogs at this site and dispersal of the juvenile bullfrogs produced here pose a considerable threat to California red-legged frogs.

Emigration of bullfrogs from San Clemente Reservoir to aquatic habitat surrounding the reservoir is likely resulting in large numbers of bullfrogs encroaching on aquatic habitats that formerly supported a larger proportion of California red-legged frogs.

The thousands of bullfrogs reproducing at, and dispersing from, San Clemente Reservoir likely out-compete, displace, and predate California red-legged frogs within and near the project area. Therefore, if the reservoir would be allowed to remain in place, substantial efforts to eradicate bullfrogs from the project area will be necessary to minimize these adverse impacts to the California red-legged frog population in the area.

Without permanently ponded water, bullfrog reproduction is severely impaired. Therefore, elimination of the reservoir (e.g., through the dam removal alternative or the dam removal and river reroute alternative) would remove breeding habitat for bullfrogs. In addition, returning the reach of the Carmel River in the project area to a free-flowing state would allow the river to seasonally create off-channel breeding habitat for

California red-legged frogs in this area while reducing the likelihood of re-establishment of bullfrog reproduction.

Response

Comment noted. In the Final EIR/EIS, additional text regarding a monitoring program and a bullfrog eradication program has been added to Section 4.5.3, mitigation for Impact Issue WI-7: Reservoir Drawdown or Elimination without Sediment Removal. Additional information is also located in the Protection Measures for Special Status Species (Appendix V).

Data have only been available since 2003, and therefore it is too soon to say whether there has been a steep decline or increase in the respective species numbers. The data indicate that in each year since 2003 there have been larger numbers of bullfrogs than California red-legged frogs in the reservoir. Evidence developed since 2003 supports the premise that California red-legged frogs have found refuge in, and naturally recruited to, upstream habitats, and that simultaneously management has reduced the number of bullfrogs in that setting, further bolstering California red-legged frogs there.

Under existing, baseline conditions, habitat for both bullfrog and California red-legged frog is present in the reservoir, and interactions between the two species likely occur. We acknowledge that an increase in ponded frog habitat within the reservoir may benefit the bullfrog population, which has the potential to negatively impact the California red-legged frog population, but insufficient data are available to determine long-term trends or causal factors. We also acknowledge that the potential for returning the Carmel River to a free-flowing state would benefit California red-legged frog to a greater extent than bullfrog, particularly if the change results in reduced population of crayfish. Consultation with the USFWS under the Endangered Species Act (ESA) will be required during permitting to develop a detailed monitoring program. Also see responses to comments TE-19, TE-20, TE-21, TE-22, TE-23, and TE-24, above.

Comment TE-32

The Department supports the Corps' commitment to designing future monitoring and enhancement efforts to minimize impacts of the San Clemente Dam Seismic Safety Project on the California red-legged frog. We recommend that control and monitoring of non-native predators (e.g., bullfrogs, crayfish (Pacifasticus leniusculus), and centrarchid fishes) be emphasized in the final EIR/EIS, in order to minimize adverse impacts of the project on California red-legged frogs and other aquatic species.

Response

Thank you for your comment. Future monitoring and enhancement efforts will be addressed with the USFWS during the ESA permitting process.

July 3, 2006 letter from Robert W. Floerke / Department of Fish and Game

Comment TE-33

Herptile habitat within the San Clemente Reservoir will be impacted by any of the four alternatives, and adverse effects on habitat and populations will be expected for California red-legged frogs, western pond turtles and Coast Range newts (all are California State Species of Special Concern). The mitigation regimen proposed for these impacts (Table 2.1) would be acceptable for SAA purposes if dam removal is implemented. It needs to be noted that, if retained, the reservoir habitat represents a management challenge relative to these species, since it will need to exist in a state of perpetual disturbance due to the requirements of sluicing, dredging and bullfrog control. Although there will be a short-term series of population reductions and habitat impacts during dam removal operations, DFG considers these to be sufficiently mitigated by the long-term benefit of riverine restoration with dam removal. Alternatively (in the case of dam retention), loss of known acreages of breeding habitat for California red-legged frogs will need to be mitigated in-kind above and beyond the avoidance and translocation plans currently proposed, as conditions to be determined in the SAA process.

Response

Thank you for your comment. Please refer to response to Comment TE-31. Consultation will be conducted with the CDFG during permitting and while a monitoring program is developed.

NOTE: COMMENTS TE-34 CORRESPONDS TO MAY 23, 2006 PUBLIC HEARING TESTIMONY

July 3, 2006 letter from Tim Jensen / Monterey Peninsula Regional Park District

Comment Received at May 23, 2006 Public Hearing

Comment TE-34

Nikki Nedeff/Resident of Carmel Valley

Removing the sediment from the San Clement side and placing it on the Carmel side still has some issues in my mind. Most importantly, will that habitat which will be lost, the wonderful riparian habitat, habitat for red-legged frog and juvenile steelhead, will that habitat be replaced by upland habitat with the addition of more sediment?

Response

The design of the diversion dam for the re-route alternative (Alternative 3) is permeable. The intention is to allow seepage that will maintain a high water table in the area downstream of the diversion, so that habitat for riparian species such as the CRLF will persist. **(Also AA-43, FI-108, TE-9, TE-31, TE-32, TE-33, and WET-5)**

Comment TE-35

The document provides a cursory description of Site 4R preparation but is inadequate for proper review as there are no details as to how vegetation "clearing and grubbing ill take place, and how and where the "stripping and stockpiling of organic soils" will occur. **(Also AA-72)**

Response

Clearing and grubbing means clearing and rooting of trees, bushes, shrubs, etc. via common mechanical equipment removal methods (e.g., chainsaws, excavators, and bulldozers). Stripping of organic soils is also achieved via bulldozers and excavators. Stockpiling will occur on the sediment disposal construction site, where the organic soils stockpile footprint will occupy a small area adjacent to construction and sediment placement operations.

Comment TE-36

The document states that the site will be "winterized" at the end of each construction season but fails to adequately describe the impacts of introducing non-native stabilizing material into the park and any mitigation measures to remove the weeds proposed for introduction. Non-native vegetation is also proposed for introduction to the site for the final topsoil re-placement. **(Also TE-11 and AA-74)**

Response

No introduction of non-native plants is proposed in the discussion of "winterizing" or in the final topsoil replacement in Chapter 3. Cut slopes, fill areas, denuded areas, and any other areas where existing vegetation cover would be removed outside the roadway would be revegetated with an appropriate seed mix. This seed mix would be selected with the assistance of a qualified revegetation specialist with demonstrated experience and expertise in revegetation, and would contain native species that are indigenous to the project area. However, native materials are not always available in the quantities needed for a project. The availability of seed can be affected by non-project events that result in a high demand for local native seed. If insufficient native seed is available, non-natives may be included in the seed mix. Such non-native species would be species known not to be invasive or persistent.

Carmel River Steelhead Association Comments on San Clemente Environmental Impact Report

Comment TE-37

The frogs that inhabit the San Clemente flood plain have taken advantage of a man made situation. One can build new depressions in the stored sediment and line them with Hypolon, thus maintaining some of this flood plain frog habitat.

Response

Thank you for your comment. Comment noted.

TRAFFIC

WRITTEN COMMENTS RECEIVED

June 9, 2006 letter from Victoria Kennedy/Sleepy Hollow Homeowners Association

Comment TR-1

Notwithstanding my comments about the Project, the Sleepy Hollow Homeowners' Association is very concerned about the comment made during the hearing that San Clemente Road, the road through Sleepy Hollow, would be used for deliveries and access for construction workers. This type of road use would cause severe negative impacts to our residents through dust, noise, and safety concerns for our children and families that utilize the roadway for residential transportation and recreate on and near the roadway. Many of our homes are situated directly adjacent to the roadway and would incur increased levels of the negative health, quality of life, and safety issues stated above. Please note that this is a gated community and the level of use of the roadway is minimal and the residents are accustomed to this lack of traffic. The type of use contemplated is in violation of our agreement with the dam owner, California American Water Company, regarding their use of the road.

Response

Thank you for your comment. Comment noted. See Section 4.7 Air Quality for a discussion of dust, Section 4.8 for a discussion of noise and Section 4.9 (TC-3) for a discussion of road safety.

Under the Proponent's Proposed Project, San Clemente Drive would not be used for access after the new Tularcitos Access Route is built (construction would take about eight months). The new Tularcitos Access Route would be utilized to access the Dam during the rest of the construction period and for ongoing operations after completion of the construction. For project Alternative 1 (Dam Notching), Alternative 2 (Dam Removal), and Alternative 3 (Dam Removal and Carmel Valley River Re-Route) primary access to the project would be provided via Cachagua Road. Access via San Clemente Drive would be used by construction workers, and occasionally for supplies or equipment (about 5 percent of project trips for such uses). These alternatives would use San Clemente Drive for initial mobilization of equipment needed below the Sam at the beginning of the project and demobilization of this equipment at the end of the project. It would also be used to provide access below the Dam for construction workers, and occasionally during the project for trucks carrying supplies or equipment. This access route was selected over the Tularcitos Access Route to avoid potential impacts on terrestrial biology. More than 75 percent of the traffic associated with these alternatives is associated with work above the Dam (e.g., construction of the reroute, sediment removal, and dam removal). Periods of mobilization and demobilization using the San Clemente Drive Access Route are expected to occur over a period of several weeks

and involve 15 to 30 trips with heavy equipment during that period. CAW is unaware of any agreement with the Sleepy Hollow Homeowners Association regarding use of the road.

Comment TR-2

All the alternatives presented to date would likely require an extraordinary number of vehicles to use San Clemente Road for deliveries and construction worker access. It would also likely require construction vehicles such as concrete trucks to use the roadway and an existing bridge that is not constructed for this frequency or type of use over an extended period of time. The road will very likely prematurely fail and require complete reconstruction during the time frame of construction of the dam work.

Response

Please see response to Comment TR-1 for a discussion of the use of San Clemente Drive for the project and project alternatives. If San Clemente Drive is used for project access, trucks using San Clemente Drive would be required to comply with the weight limitations of the bridge structure on San Clemente Drive. The single-lane bridge has been rated for 20-ton single unit truck loads and 30-ton ready-mix concrete truck loads and would not require modifications for construction operations associated with project Alternatives 1, 2, and 3. In addition, if any damage to the San Clemente Drive pavement occurred, which is not anticipated, it would be repaired after completion of the project.

Comment TR-3

The use of this road for construction purposes of any kind is totally unacceptable to the Sleepy Hollow residents. Any project alternative must require that all vehicle traffic be prohibited from using Sleepy Hollow roads. Our association is requesting that any proposed dam project would use either the Cachagua Access Route for all construction traffic, or include the construction of the Tularcitos Road access proposed (or equivalent alternate access) in the Draft EIR/EIS for the dam's seismic safety project, to be used for all deliveries and construction worker access.

Response

Thank you for your comment. Comment noted. Please see response to Comment TR-1 for a discussion of the use of the road through Sleepy Hollow. Efforts have been made to minimize use of San Clemente Drive though Sleepy Hollow and most traffic would use either the new Tularcitos Road (for the Proponent's Proposed Project) or the Cachagua Access Route (for the other action alternatives).

May 23 Community Meeting Questions from Victoria Kennedy / Sleepy Hollow Homeowners Association

Comment TR-4

Will any traffic due to this project use any road within the Sleepy Hollow Homeowners' Association boundary?

Response

Please see response to Comment TR-1 for a discussion of the use of San Clemente Drive for the Proponent's Proposed Project and the project alternatives.

Comment TR-5

Is the Tularcitos Route, the vehicle route that all project vehicles will use?

Response

For the Proponent's Proposed Project, all vehicles would use the Tularcitos Access Route for project access after the new Tularcitos Access Route is built (which would take about eight months). Please see response to Comment TR-1 for an explanation of the use of San Clemente Drive for the Proponent's Proposed Project and the project alternatives.

Comment TR-6

If there is a problem with project impacts such as noise, start times, dust, traffic control deficiencies, what will be the remedy, besides merely a phone number and person's name to call? **(Also AQ-2)**

Response

The project Applicant would be required to implement the mitigation measures included in this environmental document. The Applicant would be responsible for ensuring that the mitigation measures are implemented. Agencies and local government issuing permits would enforce compliance with permit conditions. Construction monitoring would be conducted to assure that permit requirements, resource protection measures, and mitigation measures are followed. The owner's contracts would embody pertinent requirements, and the applicant would require contractors to comply with the terms of their contracts. TC-1 for each alternative includes a Traffic Coordination and Communication Plan developed in coordination with the County of Monterey Planning and Building Department, including an on-site field office for a resident Traffic/Transportation Coordinator.

Comment TR-7

Who will determine after the project is completed, what and how much repair to Carmel Valley Road or any other public or private roads will occur due to the project's activities?

Response

Repairs to public roads would be coordinated with Monterey County Public Works staff. Repairs to private roads would be coordinated with the owners of the road. Prior to commencing work, a visual assessment of existing pavements would be performed, including a video log of the pavements to document existing, pre-project conditions. Following completion of the project, a visual assessment and a comparison to pre-

project pavement conditions would be performed to determine where pavement repairs are necessary.

Comment TR-8

Will Monterey County simply accept the traffic impact fee imposed upon the project (equivalent vehicle trips) as satisfying the road repair mitigation measure?

Response

No, the mitigation for the project requires that the project Applicant repair any roadway damage to pre-project conditions immediately after construction is complete.

Comment TR-9

The EIR/EIS states that there will be flagmen. The document does not state how, when, or where the flagmen will be used. Please provide information as to how, when, and where flagmen ill be used. Any place on public roads?

Response

Under the Proponent's Proposed Project, flagging personnel would be posted to direct traffic at the Carmel Valley Road/Tularcitos Access Road intersection during periods when double-trailer trucks are used. Should one of the project alternatives be implemented, flagmen would be used on Carmel Valley Road at Cachagua Road and San Clemente Drive anytime double-trailer trucks are entering and exiting the project. Flagmen would also be used on the dam access roads during periods of heavy truck operations on-site.

June 20, 2006 letter from Mark Delaplaine/California Coastal Commission

Comment TR-10

The proposed construction and improvement of roads for the project and for the alternatives does not include road design that results in the least storm run-off for the life of the road. We would like to see a plan for road design that incorporates those elements that will most effectively allow for the least run-off, and the least concentrated run-off. Access road improvements are assumed to be in service for the life of the dam or the sediment storage areas, and the mitigation should include plans for the same time period, not just for construction.

Response

Once an alternative is selected, detailed road design would be included in final project design. When the final design plans for the on-site roadways are prepared, the roads would be designed to minimize the storm run-off for the life of the road. Erosion control strategies and mitigation are discussed in the Final EIR/EIS in Water Quality, Section 4.3-3, and in the SWPPP (Appendix K).

June 20, 2006 letter from Jean Getchell / Monterey Bay Unified Air Pollution Control District

Comment TR-11

Project-Generated Traffic. There is no information concerning the number and type of vehicles to be used in the project, or the daily traffic schedule.

Response

Project traffic generation estimates and estimates for the project alternatives are provided in Tables 4.9-4, 4.9-5, 4.9-6, 4.9-8, and 4.9-9. Traffic generated by the project would vary during the project. Please see Chapter 3 of this final EIR/EIS for a description of the construction activities associated with the project and each of the project alternatives.

June 14, 2006 letter from Linda Agerbak

Comment TR-12

For ALL alternatives, I am concerned about the 3 or 4 year increase in traffic on Carmel Valley Road and in Carmel Valley Village, with attendant danger of accidents, plus wear and tear to roads and pavements. Money must be budgeted to restore the roads once the project is completed. And before construction begins, a traffic light must be installed at the dangerous intersection of Laureles Grade and Carmel Valley Road, assuming that traffic will increase there.

Response

Thank you for your comment. Mitigation is included that requires the project Applicant to repair any pavement damage to Carmel Valley Road east of Carmel Valley Village attributable to the project. Recent analysis of the Carmel Valley Road/Laureles Grade intersection indicates that it operates at an overall Level of Service (LOS). Operation during the AM and PM peak hours with LOS E operations on the southbound Laureles Grade approach (*Draft Revised Environmental Impact Report for the September Ranch Subdivision Project*, Michael Brandman Associates 2004). The Proponent's Proposed Project would add traffic to the intersection, but the level of service would not change with construction of the project. Intersection volumes currently meet the Caltrans peak hour traffic signal warrant; therefore, a signal would not be required to manage the increase in traffic volume at that intersection. The project Applicant would contribute fair share fees through the payment of Carmel Valley Master Plan Traffic Impact Fees for the signalization of the Carmel Valley Road/Laureles Grade intersection, as discussed in Section 4.9.3.

COMMENTS RECEIVED AT MAY 23, 2006 PUBLIC HEARING

Victoria Kennedy/Sleepy Hollow Homeowners Association

Comment TR-13

The first is regarding all the alternatives. Why can't you use the Tularcitos route for all of them?

Response

The Tularcitos Access Route is proposed as part of the Proponent's Proposed Project, because this alternative requires all construction access to be made below the Dam. The Tularcitos Access Route was developed to avoid major traffic impacts to the Sleepy Hollow community. All of the other project alternatives have primary access above the Dam, via Cachagua Road. For these alternatives, only construction worker access and limited deliveries are required below the Dam. These would not have the same scale of impact to San Clemente Drive as the full construction access that would be required for the Proponent's Proposed Project. Therefore, the Tularcitos Access Route is not proposed to accommodate this relatively small impact.

Comment TR-14

You have mentioned tonight that there's going to be deliveries and construction workers using the Sleepy Hollow access, and I would like to know how many construction workers a day we're talking about, and how many deliveries approximately? And why can't you use the Tularcitos route for these and not Sleepy Hollow?

Response

Thank you for your comment. Section 4.9 of this Final EIR/EIS provides a description of the construction crews that would be used during the project. Tables 4.9-4, 4.9-5, 4.9-6, 4.9-8, and 4.9-9 provide estimates of the number of vehicle trips that would be generated by the project and the project alternatives. Please see response to Comment TR-13 regarding the choice of Tularcitos Road and response to Comment TR-1 regarding the choice of access routes under the various alternatives.

Comment TR-15

Who will determine after the project is completed what and how much repair to Carmel Valley Road or any other public or private roads will occur due to the project's activities?

Response

Refer to comment response TR-7.

Comment TR-16

Will Monterey County simply accept this traffic impact fee imposed upon the project, the equivalent vehicle trips as satisfying the road repair mitigation measure?

Response

Refer to comment response TR-8.

Comment TR-17

And the EIR/EIS states that there will be flagmen. The document does not state how, when or where the flagmen will be used. Can you please provide information as to how, when and where the flagmen will be used -- any place on the public roads?

Response

Refer to comment response TR-12.

VISUAL IMPACTS

WRITTEN COMMENTS RECEIVED

May 23 Community Meeting Questions from Victoria Kennedy/Sleepy Hollow Homeowners Association

Comment VIS-1

The preferred batch plant site should be a location that does not cause visual, dust, and noise impacts to any Sleepy Hollow subdivision residents and/or be closer to the dam. What were the limitations to locating the batch plant closer to the dam? **(Also AA-13, AA-14, and NOI-4)**

Response

The concrete batch plant is a component of the Proponent's Proposed Project, which includes a number of elements necessary to the project. Please refer to Section 3.2 in this Final EIR/EIS for information on the batch plant. The batch plant requires a level area approximately 5 acres (about 218,000 square feet) in size with good road access in order to move in/out the larger pieces of batch plant equipment and aggregate materials. This limits possible sites for the batch plant to near Carmel Valley Road, and not up the canyon closer to the Dam due to mountainous terrain and narrow, winding access roads. There is a smaller site closer to the Dam, but it would not be large enough for large trucks to turn around. Thus, it is not technically feasible to locate the batch plant closer to the Dam. Also, the proximity of electric power lines may avoid the use of diesel generators for batch plant operation, thus avoiding emissions of NO_X, CO, ROC, SO_2 , and diesel fine particulate (PM_{10}).

Comment VIS-2

Page 2-29, does not state any visual impacts to Sleepy Hollow but the batch plant will be seen by at least the homeowners of two residences in this subdivision. Why isn't the batch plant visual impact addressed in Table 2-1?

Response

This comment has been addressed in rewriting the evaluation of impacts and mitigation in Section 4.11, Aesthetics, and is summarized in Table 2-1 as VIS-3. Site visits indicated that the batch plant would not visible from the subdivision streets. While it is possible that the some of the homeowners in the subdivision could see the batch plant from their residences, the batch plant would be a temporary structure and would be removed within one year of its construction. The distance of the batch plant from the Sleepy Hollow Subdivision is approximately 2,500 feet. This distance, coupled with obstructions from vegetation, would lessen the batch plant visual impacts to Sleepy Hollow residents. However, it is uncertain that the impacts would be reduced to a less than significant level. Visual impacts would be short-term and construction-related. No

long-term visual effects would occur as a result of the batch plant to Sleepy Hollow homeowners.

July 3, 2006 letter from Tim Jensen / Monterey Peninsula Regional Park District (MPRPD)

Comment VIS-3

Viewshed: The Draft: EIR/EIS states "None of the alternatives will have a significant impact on the environment." However, there is no evidence in the document to make such a finding. And there is no information in the document for public review and comment. The entire treatment of public viewshed and aesthetics is inadequate.

The Proposed Project and Alternatives 1, 2, and 3 include property owned by The Park District that will be environmentally altered but there is no adequate description of the visual impact or any visual exhibits of pre-project and enhanced post-project images of the impact sites. Necessary images to adequately assess pre-project and post-project viewshed/visual impacts from within the open space park by park visitors include, but are not necessarily limited to: River front views; Standing water locations and conditions; Road-cuts and corridors; Sediment disposal site; River front access.

Response

This comment has been addressed in rewriting the evaluation of impacts and mitigation in the Final EIR/EIS, Section 4.11, Aesthetics (see especially Impact Issue VQ-5), and in rewriting Section 5.3.3, Cumulative Impacts. In addition, the Land Ownership Map (see Figure 4.13-1 in Section 4.13, Land Use and Figure 4.12-3 in Section 4.12, Recreation) depicts the locations of property in the project area that is either owned by the Park District or conveyed under easement to the Park District. Potential visual impacts to future park users are likely to be less than significant or beneficial. The Proponent's Proposed Project will not affect the visual landscape in the vicinity of the lands managed by the Park District, including the access roads. The roads would be improved as part of Alternatives 1, 2, and 3, but would still be dirt roads. Therefore, there would be no visual impact as a result of the road improvements. Alternatives 1, 2, and 3 would restore part or all of the Carmel River/San Clemente Creek in these reaches to a free-flowing stream, which would have a beneficial aesthetic effect. In other sections of the Carmel River and San Clemente Creek, and under the Proponent's Proposed Project, there would be no change. With the removal of the sediment, the long-term visual effects to the riverfront would therefore be either less than significant or beneficial for future park users.

During construction, private landowners of the Stone Cabin would have views of the sediment disposal site adjacent to the Jeep Trail and the sediment conveyor overcrossing, which would be above the Jeep Trail. A relatively small segment of the sediment disposal site would be visible to the landowners traveling on the Jeep Trail for a short duration of travel time. The sediment conveyor overcrossing, together with the sediment pile, would substantially degrade the existing visual character or quality of the

site and its surroundings during construction. This would be a short-term impact. Under CEQA, this would be a significant and unavoidable impact. After construction, the sediment disposal site would be vegetated, causing it to blend with the surroundings, and the sediment conveyor overcrossing would be removed.

Comment VIS-4

The document presumes to leave the road improvements behind but does not describe any environmental impacts associated with doing so, which would be aesthetic and visual and significant compared to what is there now. Given that the property is an open space park, the cursory information provided is inadequate for effective environmental review.

Response

Park users were not included in the impact assessment because the Park District-owned land in the project area is currently not open to the public. This comment has been addressed by revising Section 5.3.3, Cumulative Impacts, in the Final EIR/EIS. Please also refer to the response to comment VIS-3 for the visual impact assessment to private landowners in the project area.

Comment VIS-5

Wetlands: All the proposed projects include environmental impacts to existing wetlands. The Park District is concerned about potential short and long-term impacts to existing wetlands from the perspective of public access and viewshed. The document does not adequately address the impact of changing wetland conditions on public perception, view, and access and therefore the document cannot be adequately reviewed for environmental impacts associated with changed public aesthetics and viewshed. Textual descriptions of pre and post project conditions are needed for adequate review and comment on the aesthetic perspective to changing wetland conditions.

Response

Regarding effects on wetlands, please refer to responses to comments TE-7, TE-9 and TE-34 located in Appendix E. This issue has been addressed in Section 4.6, Wetlands, and in the revised Section 5.3.3, Cumulative Impacts, in the Final EIR/EIS. This response addresses wetlands within public access and viewshed, only. Under the Proponent's Proposed Project, wetlands in these areas would not be affected. Under Alternative 1, sediment excavation would remove some wetlands areas, which would reestablish over time. Under Alternative 2, all wetlands would be removed. The reroute alternative design (Alternative 3) is intended to allow sufficient groundwater seepage to maintain a high water table and consequently preserve habitat for wetland-dependent species such as the California red-legged frog. Therefore there would be no long-term visual effects due to effects of the design on wetlands under Alternative 3.

Comment VIS-6

Pre-project and post-project enhanced photographic imagery depicting what the current and future park boundaries will look like are essential for adequate environmental assessment. Currently, the park has an extended and publicly accessible riverfront to perennial pools and flowing water. What will any new boundary along the park's riverfront look like and how accessible will the new riverfront be to the public? What will replace the current riparian vegetation along the park's riverfront boundary if the river course or water levels are changed? How will public access be affected and/or maintained if river-frontage is changed? **(Also REC-4, TE-37)**

Response

This comment has been addressed in rewriting the evaluation of impacts and mitigation in this Final EIR/EIS, Section 4.11, Aesthetics, and in revised Section 5.3.3, Cumulative Impacts **(Also VIS-3)**.

WATER QUALITY

WRITTEN COMMENTS RECEIVED

June 20, 2006 letter from Mark Delaplaine/California Coastal Commission

Comment WQ-1

Regarding issue WQ-16, Sediment Disposal, on page 4-94, mitigation includes annual monitoring of the sediment pile by CAW at the end of the rainy season in order to observe erosion problems. The sediment piles should be monitored occasionally throughout the rainy season so that erosion problems can be mitigated before maximum impact.

Response

As discussed in the Storm Water Pollution Prevention Plan (SWPPP, Appendix K) temporary sediment barriers would be installed around all sediment stock piles and disposal areas. Temporary sediment barriers would be designed to reduce the velocity of water flow and intercept suspended sediment conveyed by sheet flow, while allowing runoff to continue down gradient. Such installations would be used to limit sediment transport out of the construction area. Additional monitoring during the rainy season would provide opportunities for adaptive management in the event that conditions at the sediment disposal area pose an imminent stormwater runoff problem. Provisions for additional monitoring during the rainy season are included in the SWPPP.

June 29, 2006 letter from David A. Berger/Monterey Peninsula Water Management District

Comment WQ-2

Page 2-38, Para 3: Summary statement under Water Quality. "Sluicing under the PPP and Alternative 1 would lead to significant increases in turbidity in Carmel River below the dam and would not be mitigable." This statement should be modified to describe which flow components increase turbidity (suspended and bedload sediment?). It's unclear from the qualifier used ("mitigable") what impacts cannot be mitigated. This determination is necessary to realistically evaluate potential impacts to rearing and spawning habitat in the river downstream of San Clemente Dam.

Response

The summary in Chapter 2 identifies that there are increases in turbidity associated with the Proponent's Proposed Project and Alternative 1 and concludes that these increases would be significant and unavoidable. Please refer to the revised Hydrology Section 4.2 for a description of flow conditions under which sluicing would occur. Please refer to the discussion under Impact Issue WQ-13 (Section 4.3.3 of the Final EIR/EIS) and under

Impact Issues WR-2, WR-3, and WR-6 and WR-9 (Section 4.2.3 of the Final EIR/EIS) for further detail on impacts and mitigation related to sluicing.

No best management practices have been identified that could eliminate the turbidity resultant from sluicing. Thus, the impact is considered unavoidable.

Comment WQ-3

Page 3-21, 2nd bullet under Para 3: No standards are provided for turbidity levels that may be too high to release. The FEIR/S should provide standards and a specific, detailed description of how the project construction and operations schedule would be modified to mitigate for increased turbidities. Has the possibility of filtering turbid water through the Carmel Valley filter plant and then injecting clear water into the river been considered?

Response

Appropriate turbidity standards will be discussed during permitting with the Regional Water Quality Control Board, NOAA Fisheries, and CDFG and will clarify the water quality standard to which the project will be managed. Turbidity will be monitored daily, and discharges from zones where control is possible (e.g., settling basins) will be stopped until criteria are met. Measures to minimize and mitigate turbidity resultant from project actions (e.g., return of bypassed flows) are included in the SWPPP (Appendix K). These measures would be expected to minimize turbidity effects from all sources except sluicing (Issue WQ-13) and the reservoir drawdown (Issue WQ-9) to less than significant. The prospect of filtering turbid water through the Carmel Valley Filter Plant (CVFP) was not considered. The CVFP uses pressure filters, which rely on the water intake being located above the plant at the reservoir. The turbidity inputs would likely occur downstream of the dam, so there would be no route to convey the higher turbidity water into the plant through the existing filter plant intake. Even if a large pumping station and new intake were constructed to deliver high turbidity river water to the pressure filters, the turbidity loading on the filters would greatly exceed the design capacity of the plant. However, a mobile filter plant may be used to treat water prior to release back into the river.

Comment WQ-4

Page 3-23, Para 2: A turbidity standard needs to be presented that will protect downstream areas from impacts. Because construction is proposed during low flow periods, the effect of turbid water being released to downstream areas can persist for several miles downstream from a release point.

Response

Refer to comment response WQ-3.

June 22, 2006 letter from David Zaches

Comment WQ-5

There are hundreds of thousands of cubic yards of sediments behind the dam which have been in place, unmoved for 30, 50 and even 85 years. Toxics could be concentrated. If the alternatives to either notch the dam or demolish and remove it are chosen, sediments will be moved with shovels and bulldozers and will be greatly disturbed and dislocated. Any potential toxics could escape into the Carmel River channel and affect the Cal Am water supply as well as riverbed and ponds, wetlands and the Lagoon which the river creates.

The greatest disturbance would occur if the dam is removed. The plan is to re-channel the River into the San Clemente Creek channel. The portion of this channel which is also behind the dam is filled with sediments similar to those in the adjacent Carmel River channel behind the dam. They potentially could contain similar toxics and if they do, the toxics could also wash down the Carmel River channel, harming the watershed down the channel.

I'd like to request that core samples of the sediments of the River and Creek channels behind the dam be made to ascertain whether there are toxics, of what type and quantity, and what risk they might pose to the Carmel River channel downstream and the drinking water supply, under each possible alternative for dam safety retrofit or removal.

Response

Samples from the impounded sediments behind San Clemente Dam (SCD) were collected and analyzed to assess the gradation of the sediment and the quality (ENTRIX 2002). The analysis of the quality found traces of Arsenic (As), Barium (Ba), Chromium (Cr), Copper (Cu), Nickel (Ni), and Zinc (Zn). However, none of the water quality parameters analyzed were found to exceed water quality standards. The results of the pore-water water quality analysis are found in this Final EIR/EIS, Appendix Q.

June 30, 2006 comments from National Marine Fisheries Service (NMFS)

Comment WQ-6

Referring to page 2-39, NMFS recommends adding "long-term" while describing significant unavoidable impacts to water quality and fish. **(Also FI-65)**

Response

Downstream impacts from sluicing would be temporary due to the fine sediment that would be transported initially. Over time, the sediments would become coarser and would be beneficial over the long-term.

Comment WQ-7

Referring to page 4-88 (Issue WQ-15: Operations/Post-Project Conditions), NMFS agrees summer water quality conditions in the reservoir would be better than during drawdowns. However, water quality conditions in the reservoir due to long-term winter sluicing operations needs to be included and analyzed. Issue WQ-13 addresses water quality below the reservoir from sluicing, but not conditions in the reservoir.

Response

In approximately six to ten years only a remnant pool would remain behind San Clemente Dam under the Proponent's Proposed Project or Alternative 1. Under both options the reservoir would be filled with sediment. Instead, there would be a river channel very similar to what exists between about 2,500 to 5,000 feet upstream of the SCD today. Sediment sluicing is more fully discussed in the revised Sections 4.2 and 4.3 and the SOMP (Appendix J), in the Final EIR/EIS, and would affect about 500 feet of channel in close proximity to the Dam. Potential water quality impacts would include increased suspended sediment and turbidity extending from the upstream extent of the influence of sluicing and progressively increasing toward the Dam. Such impacts would only be short-term and would only occur during sluicing events. These water quality impacts would cease once sluicing stops and water quality would return to background conditions. Sluicing would only occur during the rising limb of a hydrograph and at flows between 300 and 800 cfs. Therefore, background conditions would typically consist of some level of turbidity and suspended sediment.

Comment WQ-8

Referring to page 4-93, in the paragraph before Issue WQ-2: is this supposed to be Alternative 3? Also on Pg 4-94 under Issue WQ-14, it states "…the extent of potential impacts would be greater under Alternative 2." Is this also supposed to state Alternative 3?

Response

Yes. It appears that a formatting error collapsed the subheading for Alternative 3 within the first italicized paragraph on page 4-93. The discussion of impacts under Alternative 3 begins with the second paragraph of italicized text on page 4-93. The error has been corrected in the Final EIR/EIS report.

COMMENT RECEIVED AT MAY 23, 2006 PUBLIC HEARING

Comment WQ-9

Dave Zaches/Resident of Carmel Valley

The other thing is the toxics, the pollutants, the chemicals which have been inserted into the Carmel River area behind the dam, below the dam. We're all drinking that water. And I haven't heard anyone really address to my satisfaction, and I can't understand

what's in the report frankly. It's very, very complex, and I don't know whether one part per million is okay or one part per billion is okay. But I hope a lot of attention will be given to that in the rerouting of the river way or the, you know, so-called encapsulation or trapping of the sediments and the toxics and pollutants. When that river gets to flowing, it rolls big boulders down the stream. It's a very powerful force. So I hope that whichever alternative comes up, it will consider that.

Response

Thank you for your comment. Comment noted. It is not clear whether a particular pollutant of concern is intended in this comment. Refer to response to Comment WQ-5 regarding toxics that may be released from the sediment stored above the Dam.

WATER RESOURCES

WRITTEN COMMENTS RECEIVED

June 29, 2006 letter from David A. Berger / Monterey Peninsula Water Management District

Comment WAT-1

Page 3-12, Para 1: "The reservoir and Carmel Valley [Filter Plant] CVFP are also the primary water source for unincorporated Carmel Valley Village during the winter. Currently, the reservoir serves as a point of diversion to serve the Peninsula…" The FEIR/S text should be corrected to reflect operations as regulated by NOAA Fisheries and the State Water Resources Control Board. These agencies have limited the diversions at San Clemente Dam to zero and allow only limited diversions from the river from Russell Well field during low-flow season.

Response

Diversions at San Clemente Dam (SCD) are not limited to zero, as this commenter acknowledges in Comment WAT-4 below. Section 3.2.3 has been updated in the Final EIR/EIS to respond to this comment.

Comment WAT-2

Page 3-15, Para 4: Under Carmel Valley [Filter Plant], the description for FEIR/S should be revised to reflect comment 3-12, Para 1 above.

Response

Section 3.2.3 has been updated in this Final EIR/EIS to respond to the referenced comment (WAT-1). However the bearing of this requested revision on the EIR/EIS description of the Carmel Valley Filter Plant (CVFP) is not clear.

Comment WAT-3

Page 3-44, Para 1: "the point of diversion would need to be replaced at a 525-foot elevation in the immediate vicinity of San Clemente Reservoir to avoid extensive improvements to the existing filter plant." Currently, Cal-Am is able to divert 1.4 cfs to the CV Filter Plant through the Russell Well field, without any improvements and the loss of pressure from San Clemente Dam. The FEIR/S should fully review the need for moving the diversion point upstream 6,000 feet and should describe potential impacts on habitat at the point of diversion and in the reach(s) affected by diversion. Alternatives to moving the diversion should be fully evaluated. These comments apply to other alternatives, including the No Project. **(Also NEPA/CEQA-19)**

Response

A purpose and objective of the project is to "maintain a California American Water (CAW) point of diversion on the Carmel River to support existing water supply facilities, water rights and services" (see Section 1.4 of the Final EIR/EIS). All alternatives that include dam notching or removal would require replacement of the point of diversion to gravity feed the system that is currently provided by SCD. The Russell Well fields are at an elevation lower than the base of SCD and therefore cannot provide gravity feed to the CVFP. Pumping from the Russell Well field would entail additional impacts as compared to the existing gravity feed system. To maintain the head provided at the existing point of diversion (the Dam), it would be necessary to relocate the diversion point approximately 6,000 feet upstream. This feature is common to all dam removal alternatives. Evaluation of the effects of relocating the diversion upstream can be found in Sections 4.2 and 4.4 of the EIR/EIS.

Note that, as described in Sections 2.2 and 3.1.2 of this Final EIR/EIS, alternatives to replace the CAW water diversion point at San Clemente Reservoir were also evaluated.

Comment WAT-4

Page 3-44, Para 2: "The screened intake would need to be constructed and maintained approximately 6,000 to 6,500 feet upstream of the dam." The FEIR/S should describe Cal-Am's current right to divert flow at San Clemente Dam and whether Cal-Am needs to apply to the State Water Resources Control Board for a modification to move its point of diversion. Currently, Cal-Am is limited to direct diversion of 1,100 AF at San Clemente Dam. This is equivalent to a continuous direct diversion rate of ~3.1 cfs over a typical 180-day, six-month long dry season. If more than 1,100 AF is proposed for diversion at San Clemente Dam, Cal-Am would also need to modify its water right to increase the quantity of water diverted. This comment applies to all of the alternatives, except the No Project.

Response

Section 3.2.3 has been updated in the Final EIR/EIS to respond to this comment. Operations in terms of the timing and amounts of flow diverted and water supplied from CAW facilities would not change as a result of implementing any of these alternatives.

Alternatives 1, 2, and 3 would require moving the CAW point of diversion at San Clemente Dam. The California State Water Resources Control Board (SWRCB) issues permits for surface water diversions. If the point of diversion were to be moved, CAW would file an application, and all the required supporting information, with the SWRCB.

Comment WAT-5

Pages 3-72, Para 4: statements regarding moving the diversion point at San Clemente Dam and maintaining a maximum diversion rate of 16 cfs from a new diversion point upstream of rerouted dam should have the same review, evaluation and potential

actions by the SWRCB, as notching alternative. The FEIR/S should address similar issues as per comments on page 3-44, Para 1 & 2.

Response

Evaluation of the effects of relocating the diversion upstream is in Sections 4.2 and 4.4 of this Final EIR/EIS. The SWRCB issues permits to divert surface water. If the selected alternative requires a new point of diversion, CAW (the Applicant) would file an application (and all required supporting information) with the SWRCB.

May 24, 2006 letter from Don Redgwick

Comment WAT-6

Water storage can offset the use of energy used to produce water by reverse osmosis (the cost of energy has become an important political issue).

Response

SCD was not originally constructed for water storage, but to provide a point of diversion on the Carmel River and head for gravity feed into the water system. It is not a water storage project. The purpose and need of the action which the EIR/EIS evaluates is to provide safety, not to alter or improve the water system. Therefore, the EIR/EIS does not consider alternatives for water supply or water storage. Where an alternative affects the operation of the water system, it includes those elements necessary to maintain the essential functions of the water system.

Comment WAT-7

The use of rubber dams in the Carmel River could be a means of diverting water to underground storage. Rubber dams are filled with water to weigh them down. If the water level behind them is allowed to get to high, they can float or slide downstream. Rubber dams are specialized tools that are only good for specific conditions.

Response

SCD was not originally constructed for water storage, but to provide a point of diversion on the Carmel River and head for gravity feed into the water system. It is not a water storage project. The purpose and need of the action which the EIR/EIS evaluates is to provide safety, not to alter or improve the water system. Therefore, the EIR/EIS does not consider alternatives for water supply or water storage. Where an alternative affects the operation of the water system, it includes those elements necessary to maintain the essential functions of the water system.

May 25, 2006 letter from Anthony G. Davi, Sr.

Comment WAT-8

I am writing to you regarding the proposal relating to the San Clemente Dam in Carmel Valley, California. As you know, the Monterey Peninsula and surrounding areas has

inadequate water storage facilities, that the State of California has mandated this problem be resolved and that California American Water Company reduce its pumping from the Carmel River, which is and has been our primary source of water for hundreds of years. The San Clemente Dams original water capacity was 2,000 acre-feet and now is only 100 acre-feet. The Dam's retrofitting and refilling to 2,000 acre-feet would go a very long way to solving the excess pumping and our water dilemma. Our problem, as I understand it, is not the availability of water it is the ability to store excess water, which now flows to the sea. Although the cost may be high, the need is even higher. The Monterey Water Management District was formed several decades ago for the purpose of developing a solution to the water problem. They have spent hundreds of millions of dollars on programs, studies, and water conservation policies; however, they have been unsuccessful in developing a serious storage source. Environmentalists have successfully blocked every plan for long-term storage that has been proposed. While I support protecting the environment, I also believe that the needs of the public should be equally protected. The Monterey Peninsula Water District probably has one of the highest water rates in the country and I understand substantial increases will be forthcoming. The San Clemente Dam is an opportunity to create a major water storage facility. This is an existing facility the community has accepted and to retrofit the dam, I believe, should be given very serious consideration.

While rerouting the river for the fish and preserving the frogs habitat is important, it is equally important and the responsibility of the State of California to provide leadership to help resolve this storage problem. Remember it was the State of California that mandated the reduction in pumping from the Carmel River that resulted in a water problem for the community being served.

For example, currently there are numerous owners of lots of record in the district that are unable to obtain water for their properties. So lot owners continue to pay property taxes without the use of their property. Also changes of use in the commercial properties that result in increased water use are prohibited. Commercial property owners experience longer vacancy periods and businesses have limited expansion opportunities.

Response

SCD was not originally constructed for water storage, but to provide a point of diversion on the Carmel River and head for gravity feed into the water system. It is not a water storage project. The purpose and need of the action which the EIR/EIS evaluates is to provide safety, not to alter or improve the water system. Therefore, the EIR/EIS does not consider alternatives for water supply or water storage. Where an alternative affects the operation of the water system, it includes those elements necessary to maintain the essential functions of the water system.

NOTE: COMMENTS WAT-9 THROUGH WAT-12 CORRESPOND TO MAY 23, 2006 PUBLIC HEARING TESTIMONY

Comment WAT-9

Roy Kaminski

It seems to me that the dam serves a purpose with head and it also serves a purpose of having water available in case we have a major fire catastrophe. So I should think that having water in a location, maybe only 50 or 100 acre feet, would be of some service.

Response

Thank you for your comment. SCD was not originally constructed for water storage, but to provide a point of diversion on the Carmel River and head for gravity feed into the water system. It is not a water storage project. The purpose and need of the action which this Final EIR/EIS evaluates is to provide safety, not to alter or improve the water system. Therefore, the EIR/EIS does not consider alternatives for water supply or water storage. Where an alternative affects the operation of the water system, it includes those elements necessary to maintain the essential functions of the water system.

Comment WAT-10

Roy Kaminski

That [dam removal and restoring a free-flowing river] probably would eliminate the need for a desal plant in Moss Landing. If we had the river running 24 hours a day, 7 days a week, 365 days a year, I think that might solve our water problem.

Response

SCD was not originally constructed for water storage, but to provide a point of diversion on the Carmel River and head for gravity feed into the water system. It is not a water storage project. The purpose and need of the action which the EIR/EIS evaluates is to provide safety, not to alter or improve the water system. Therefore, the EIR/EIS does not consider alternatives for water supply or water storage. Where an alternative affects the operation of the water system, it includes those elements necessary to maintain the essential functions of the water system.

Comment WAT-11

Dave Zaches/Resident of Carmel Valley

If the river is rerouted, why don't we have some sort of water storage there, even a small one, for wildlife, fish, etc.?

Response

SCD was not originally constructed for water storage, but to provide a point of diversion on the Carmel River and head for gravity feed into the water system. It is not a water

storage project. The purpose and need of the action which the EIR/EIS evaluates is to provide safety, not to alter or improve the water system. Therefore, the EIR/EIS does not consider alternatives for water supply or water storage. Where an alternative affects the operation of the water system, it includes those elements necessary to maintain the essential functions of the water system.

Comment WAT-12

Rex Keyes/Resident of Salinas

I don't think we had a dam built in California in the last 50 years and having this increased water supply to the Monterey Peninsula would be a great value.

Response

SCD was not originally constructed for water storage, but to provide a point of diversion on the Carmel River and head for gravity feed into the water system. It is not a water storage project. The purpose and need of the action evaluated in this Final EIR/EIS is to provide safety, not to alter or improve the water system. Therefore, the EIR/EIS does not consider alternatives for water supply or water storage. Where an alternative affects the operation of the water system, it includes those elements necessary to maintain the essential functions of the water system.

June 27, 2006 letter from Steven A. Hillyard

Comment WAT-13

The EIR/EIS considers five alternatives including two that interest me. First, it considers removing silt in preparation for removing the dam. Second, it considers strengthening the dam. Since both are feasible, this means that the dam continues to be a technically viable water storage facility with a current status of being burdened by extensive deferred maintenance. Because the EIS/EIR fails to consider this alternative, it is deficient.

Y*our agencies can take notice of the fact that the Monterey Peninsula has a very urgent water storage need. Further, you can assume that additional water storage or desalinization facilities will be built to meet this need. The current debate over the desalination plants planned for Moss Landing is credible evidence of the validity of these assumptions.*

There are very significant environmental impacts associated with the alternatives to using San Clemente Dam for meeting at least a portion of the Peninsula's water needs. Those associated with the desalination project, including operational impacts such as the discharge of green house gasses associated with powering the process, are the most glaring.

Because San Clemente Dam is a viable storage facility, the alternative "uses" that call for it to be taken out of service are burdened with the external environmental impacts

associated with replacing its storage capacity. To make an informed decision in the permitting process, decision makers should be informed of these impacts. To facilitate that, the EIS/EIR should consider the rehabilitation alternative. **(Also AA-64)**

Response

SCD was not originally constructed for water storage, but to provide a point of diversion on the Carmel River and head for gravity feed into the water system. It is not a water storage project. The purpose and need of the action which the EIR/EIS evaluates is to provide safety, not to alter or improve the water system. Therefore, the EIR/EIS does not consider alternatives for water supply or water storage. Where an alternative affects the operation of the water system, it includes those elements necessary to maintain the essential functions of the water system.

June 28, 2006 letter from Bob Baiocchi/Carmel River Steelhead Association

Comment WAT-14

The water right permit(s) that allows Cal-American to store and divert water from San Clemente Dam and Reservoir must be cancelled or amended by the State Water Resources Control Board because San Clemente Dam is not being operated as it has in the past because of the failure of the dam to store the state's water. The California State Water Resources Control Board is the authority in water rights matters and not the Department of Water Resources, the Army Corp of Engineers, or Cal-American Water Company. This water rights matter must be disclosed, discussed, and mitigated in the final EIR/EIS.

Response

SCD was not originally constructed for water storage, but to provide a point of diversion on the Carmel River and head for gravity feed into the water system. It is not a water storage project. It continues to operate in compliance with water rights issued by SWRCB. If the selected alternative requires relocation of the point of diversion, CAW (the Applicant) would file an application (and all required supporting information) with the SWRCB.

WETLANDS

WRITTEN COMMENTS RECEIVED

June 30, 2006 letter from Trish Chapman/California Coastal Conservancy

Comment WET-1

Issue WET-1: Permanent Loss of Wetlands and Other Waters of the U.S. The mitigation for this impact states that lost acreage would be replaced through either or both of two options: 1) restoration of other wetlands at a 3:1 ratio; and/or 2) conservation of existing wetlands at a 1:1 ratio. If only option 2 is used, it would result in a net loss of wetlands which would not be sufficient mitigation to make the impact less than significant. The mitigation should be structured so there is no net loss of wetland acreage. It is unlikely that created or restored wetlands will function at as high a level as the existing wetlands that will be permanently lost. Therefore, conservation of existing wetlands may be suitable as a way to augment wetlands loss that is also mitigated through creation or restoration of wetlands in order to make up for the functional loss. But it is not sufficient as mitigation on its own.

Response

Please see the Botanical Management Plan (Appendix U) in the Final EIR/EIS which includes provisions for restoration, mitigation, and monitoring of wetlands and Other Waters of the U.S. that would potentially be affected by the Proponent's Proposed Project and the other action alternatives. Lost acreage would be replaced through either conservation or restoration. Riparian and fringe palustrine emergent wetlands similar in function to the streamside habitat of the lost acreage would be created or restored at a 3:1 ratio. Any necessary grading, and the placement of cuttings or seedlings in the appropriate habitat, would take place under the supervision of a qualified botanist. Seedlings would be from Carmel Valley area populations. Replacement plantings would be monitored for at least five years. Seedlings would be replanted as necessary to ensure long-term survival. Restoration sites would be monitored for five years. Final performance criteria and mitigation ratios would be developed by DFG and the USACOE during the permitting process. The DFG and USACOE will have regulatory authority over the measures in the Botanical Plan, but at minimum, the plan includes cover criteria for native vegetation (ranging from 50 to 75 percent) and survival criteria for planted woody vegetation. Restoration may be conducted in appropriate areas along the Carmel River on land that is owned by the Project Proponent or on appropriate streams elsewhere in the watershed. Restoration sites would be conserved in perpetuity. See the Botanical Resources Management Plan (Appendix U) for details of the mitigation and monitoring planned for all botanical resources including wetlands.

Comment WET-2

Alternatives 1 and 3, Issue WET-1: Permanent Loss of Wetlands and Other Waters of the U.S. It is not clear how loss of Other Waters of the U.S. would be mitigated.

Response

See response to Comment WET-1. Mitigation options for Other Waters of the U.S. include stream channel improvements or funding of channel improvement projects.

June 29, 2006 letter from David A. Berger / Monterey Peninsula Water Management District (MPRPD)

Comment WET-3

Page 2-36, Table 2.4: The tabulation of acreages under Other Waters of the U.S. appears to underestimate the extent of waters affected by alternatives. For example, under Alternative 2 the total area of waters listed for the Carmel River, San Clemente Creek, and Reservoir Pool is 10.9 acres, including 6.8 acres for the reservoir pool, leaving 4.1 acres for the Carmel River and San Clemente Creek. The length of stream affected by existing San Clemente Reservoir is ~7,250 feet in the mainstem and ~ 2,500 feet in San Clemente Creek. Based on the combined lengths, the average stream width of Other Waters is purportedly ~18 feet, yet this seems well under actual measurements of stream widths in the affected waters. For example, measurements of average stream width at two sites in the inundation zone show that stream width varies from 18 to 34 feet, and these measurements were made during the lowest flow periods in 2004 and 2005. The source of possible error(s) is beyond the scope of this review, but the FEIR/S should reevaluate methods, standards and analysis used to develop areas of both Other Waters and Jurisdictional types and validate estimates with measurements in the field.

Response

The acreages were determined using standard mapping methods, including evaluation of the location of Ordinary High Water Mark (OHWM) indicators such as driftlines. These indicators were carefully evaluated, because the winter of 2004/2005 was a high-flow year, and driftlines, sediment deposits, and other such indicators could have been present in areas outside the OHWM. Some upstream survey work was conducted in early 2006 when flows were high.

Observations in 2005 and 2006 indicated that there are changes from earlier conditions, both those that prevailed before the water level was lowered and those that prevailed after wetland delineations were conducted in 1994 and 1997 following the reduction in water level. For example, some areas previously flooded by the reservoir are no longer flooded and what were side channels now show no evidence of inundation by the river. The impact analysis is based on conditions which includes the reduction in the maximum and minimum water elevations from interim drawdowns as part of the

baseline conditions. The final acreage values will be determined through the U.S. Army Corps of Engineers 404 permitting process.

Comment WET-4

Page 2-36, Table 2.4: The characterization of impacts for Alternative 4 (No Project), No direct impacts, ignores continuing impacts of the interim drawdown project on Jurisdictional and Other Waters of the U.S. In this regard, the Final EIR/S should fully address potential impacts of the Drawdown Project.

Response

The impact analysis is based on conditions which include the reduction in the maximum and minimum water elevations, from interim drawdowns, as part of the baseline conditions.

Comment WET-5

Page 3-80, Para 3: "The 200-foot wide by 3-foot thick by 40-foot deep soil cement cutoff wall will be constructed to bedrock to prevent undermining and seepage of river flows below the diversion dike." How will a high phreatic water surface be maintained in the old sediment layers immediately upstream of San Clemente Dam, which is described on page 3-75 Para 3 as a project goal? The FEIR/S should fully evaluate how the existing wetlands will be maintained given the lack of seepage past the diversion dike and the 550 foot elevation of the proposed sediment disposal area. Based on the distribution of habitat types in the existing inundation zone, it is more reasonable that the higher elevation of new sediments in the disposal zone and lack of seepage from the old river channel will severely limit distribution of phreatic zones and reduce wetland coverage in the project area. This should be fully evaluated in the FEIR/S and adjustments made to estimates of jurisdictional wetlands. **(Also AA-43)**

Response

The cutoff beneath the diversion dike will be placed for maintaining the foundation stability of the dike; however, the dike itself will be permeable. The intention is to allow seepage that will maintain a high water table in the area downstream of the diversion, so that habitat for riparian species will persist.

Appendix F

ACCESS ROUTE SCREENING

APPENDIX F

ACCESS ROUTE SCREENING

1.1 INTRODUCTION & APPROACH

As part of the San Clemente Dam Seismic Safety EIR/EIS, a preliminary screening analysis was conducted for the potential major access routes to and from San Clemente Dam. The purpose of the screening analysis was to choose preferred access route(s) for use with the dam Alternatives in the EIR/EIS.

The access routes were screened using impact criteria. The relative impacts of the access Alternatives were determined by (1) the impacts of traffic over them (e.g., safety, air quality, noise, etc.) and (2) the comparative impacts of the routes themselves (e.g., effects on habitat). The screening analysis used these criteria: traffic and safety, air quality, noise, effects on roads and bridges, stream crossings and effects on terrestrial biology.

The criteria were used to assess low, medium, high truck traffic volumes over each of the four Alternative access routes (Sleepy Hollow, SHHA, Tularcitos, and Cachagua). These traffic volumes were established to bracket the range of possible impacts for the various dam Alternatives paired with sediment transport and disposal options. Corresponding traffic volumes were defined based the on number of truck trips of given weight. This approach was used to assure that the "high" traffic volume captures the expected traffic that would be generated by full removal of all the sediment behind the dam. The high, medium and low truck volume categories were defined as follows:

- Low: 10 loads (20 total trips, 10 inbound/10 outbound)
- Medium: 210 loads (420 total trips, 210 inbound/210 outbound)
- High: 415 loads (830 total trips, 415 inbound/415 outbound)

The “low” truck traffic volume corresponds to trucking activity associated with construction mobilization, access road improvements and hauling construction material for dam re-construction. The “high” truck traffic volume corresponds to trucking activity associated with sediment disposal via truck. For example, hauling sediment by truck to Site 4R would generate about 415 loads per day with a production rate of 500 cubic yards per hour. The “medium” truck traffic volume corresponds to moderate level of trucking activity and was set about mid-way between the low and high truck volume levels.

The access route screening does not replace a traffic analysis of the dam Alternatives in the EIR/EIS, but was conducted only to choose among the major routes. Each dam Alternative differs in terms of the kinds and numbers of trips required (e.g., for

construction heavy equipment, construction materials, debris removal, sediment removal, construction workers). The EIS/EIR contains a traffic element that analyzes the kinds and numbers of trips and multiple routes that vary with the dam Alternatives and subcomponents.

The preliminary access route screening analysis used existing information from the RDEIR and other sources wherever possible. However, the RDEIR generally lacks detail for comparison of impacts among Alternatives, including Alternative access routes.

1.2 ACCESS ROUTE ALTERNATIVES

Four potential major access routes were considered (Figure F-1):

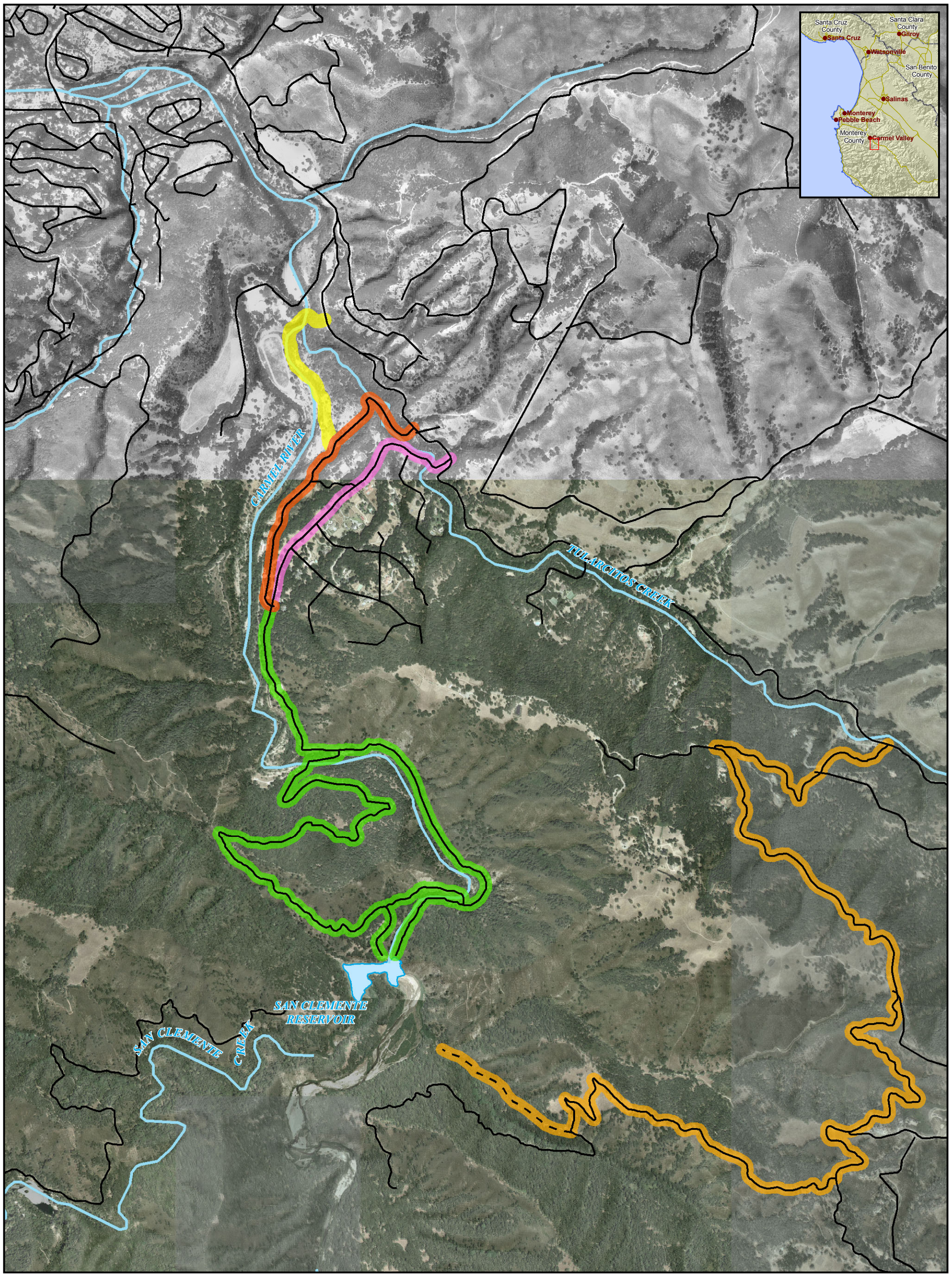
SLEEPY HOLLOW ROUTE

This access route following San Clemente Drive and Center Court Place through the Sleepy Hollow Subdivision was originally proposed and analyzed in the 2000 RDEIR. San Clemente Dam and the filter plant are currently accessed from Carmel Valley Road via San Clemente Drive, a gated private road. San Clemente Drive is a paved hard-surfaced road between Carmel Valley Road and a locked gate that prevents public access to the reservoir. From the locked gate on CAW property, the dam access road is a one-lane unpaved road with turnouts to the lower and upper dam roads. The low road provides access to the base of the dam and the high access road provides access to the top of the dam. Low road access to the base of the dam is currently impassible and would require improvements to repair washouts.

The revised Sleepy Hollow access route proposes access via San Clemente Drive to Center Court Place, a paved one-lane roadway, and would remove San Clemente Dam traffic from the segment of San Clemente Drive south of Center Court Place. From Center Court Place, the route would continue on an existing dirt road to and past the filter plant to San Clemente Drive, south of the Sleepy Hollow subdivision. At this point, the route connects with existing access roads to the dam. For purposes of comparison, impacts from this road are assumed to include a 20-foot width at the Carmel Valley Road end, and a 15-foot width for the remainder.

Sleepy Hollow Homeowner's Association (SHHA) Route

This access route Alternative was proposed by the Sleepy Hollow Homeowners Association and briefly analyzed as a CEQA Alternative in the 2000 RDEIR. The portion of the access route between the dam and the filter plant would be as described for the Sleepy Hollow Route. Access to Carmel Valley Road would be provided via a new route that would intersect Carmel Valley Road about 2,800 feet west of San Clemente Drive. From Carmel Valley Road, the access road would drop down from Camel Valley Road on a slope about 70 feet in height to a 14 foot wide bridge over Tularcitos Creek. It would continue across the level flood plain along Carmel River and eventually intersect the existing dirt road to the filter plant.



Legend

Access Routes
- Cachugua / 4R
- Sleepy Hollow
- Tularcitos
- Sleepy Hollow / Tularcitos*
- SHHA

- Stream
- Reservoir
- Existing Road
- Proposed Road

Note: Carmel River Reroute not included in screening - not part of report.

Projection: California State Plane, Zone IV
Datum: NAD 83 Units: Feet

San Clemente Dam EIS/EIR

Figure F-1

Access Route Screening

0 0.15 0.3 0.6

Miles

N

C:\GIS\entrix\3018605\map\SC_AccessRoutes_17i11i_03.mxd 10/3/2005 1:01:49 PM Mukhtyar

For the screening analysis, impacts from this route are assumed to include a 22-foot width at the Carmel Valley Road end, and a 15-foot width for the remainder. This route also includes construction of a new crossing of the Carmel River.

TULARCITOS ROUTE

This route was also briefly analyzed as a CEQA Alternative in the 2000 RDEIR. This route uses the same roads as described for the SHHA Route and the Sleepy Hollow Route between the filter plant and the dam. North of the filter plant, a connection to Carmel Valley Road is provided via a new route that intersects Carmel Valley Road about 750 feet west of San Clemente Drive. The access road intersection with Carmel Valley Road would occur at an existing intersection with a private driveway serving several residential lots on the north side of Carmel Valley Road. Immediately south of Carmel Valley Road, the new access road would cross Tularcitos Creek via a new single lane bridge that would be 14 feet wide. At the creek crossing, the road would turn west for about 800 feet, then turn south and continue in an approximate north-south alignment to the water filter plant. For the screening analysis, impacts from this route are assumed to include a 22-foot width at the Carmel Valley Road end, and a 15-foot width for the remainder. This route also includes construction of a new crossing of the Carmel River.

Cachagua Access Route

This access route presents a new concept that has not been mapped or analyzed. This route includes Cachagua Road from Carmel Valley Road to the jeep trail, the jeep trail to sediment disposal Site 4R, and conveyor belt access to the San Clemente Reservoir from Site 4R. Cachagua Road is a two-lane rural winding road that provides access to the Cachagua area of Monterey County. It intersects Carmel Valley Road about 2 miles east of San Clemente Drive. Cachagua Road is generally 18 to 20 feet wide, although there are sections that are narrower. The jeep trail that will provide access from Cachagua Road to Site 4R intersects Cachagua Road about 3 miles south of Carmel Valley Road. For the screening analysis, potential impacts to Cachagua Road are estimated for a 30-foot width, to include impacts to either or both sides of the road. Potential impacts to the jeep trail and the new road are estimated for a 20-foot width.

1.3 FIELD RECONNAISSANCE & EVALUATION

On March 22 and 23, 2005, ENTRIX conducted field reconnaissance to inspect the four potential access routes. Table F-1 provides a summary evaluation of the environmental constraints. Each row of the table presents the criteria used in environmental constraints analysis; the table columns present each of the sites evaluated.

Table F-1: Summary of access route screening environmental constraints analysis

Criteria	Access Routes			
	Cachagua	**SHHA**	**Sleepy Hollow**	**Tularcitos**
Air Quality Background: NO_x 266 µg/day CO 4257 µg/day PM_{10} 57 µg/day	Air emissions: NO_x 0.53 lb/day CO 0.13 lb/day PM_{10} 20 lb/day Maximum pollutant concentrations: NO_x 0.34 µg/day CO 0.08 µg/day PM_{10} 5.1 µg/day	Air emissions: NO_x 0.43 lb/day CO 0.10 lb/day PM_{10} 16 lb/day Maximum pollutant concentrations: NO_x 0.27 µg/day CO 0.06 µg/day PM_{10} 4.1 µg/day	Air emissions: NO_x 0.43 lb/day CO 0.10 lb/day PM_{10} 16 lb/day Maximum pollutant concentrations: NO_x 0.27 µg/day CO 0.06 µg/day PM_{10} 4.1 µg/day	Air emissions: NO_x 0.41 lb/day CO 0.09 lb/day PM_{10} 15 lb/day Maximum pollutant concentrations: NO_x 0.27 µg/day CO 0.06 µg/day PM_{10} 4.1 µg/day
Noise Background: 37 dBA @ 100 m	Attenuated noise levels 67 dBA @ 150 M	Attenuated noise levels 67 dBA @ 150 M	Attenuated noise levels 75 dBA @ 150 M	Attenuated noise levels 75 dBA @ 150 M
Stream Crossings & Aquatic Biology	No crossings. No steelhead impacts.	Three: two stream crossings at existing bridge and concrete ford on the Carmel River, and one new crossing at Tularcitos Creek. Potential steelhead impacts, possible benefit in replacing the ford.	Three stream crossings at existing bridges and concrete ford: two on the Carmel River and one at Tularcitos Creek. Potential steelhead impacts, possible benefit in replacing the ford.	Three stream crossings: two at existing bridge and concrete ford on the Carmel River and one new crossing at Tularcitos Creek. Potential steelhead impacts, possible benefit in replacing the ford.
Roads, Bridges Traffic & Safety	Cachagua Road has poor geometrics. Poor sight distance exists at the Carmel Valley Road/Cachagua Road intersection and at the Cachagua Road/Jeep Trail/Dam Access Road intersection. Potential impact to Cachagua Road pavement condition. Cachagua Road motor vehicle, pedestrian, and bicycle safety would be impacted by construction-related traffic.	Adds a new intersection to Carmel Valley Road. No impacts on communities and safety.	Potential impacts to San Clemente Drive and Center Court Place pavements. Quality of life impact to residents of Sleepy Hollow, a community located immediately adjacent to sections of San Clemente Drive used for dam access. San Clemente Drive motor vehicle, pedestrian, bicycle safety impacted.	Adds a new intersection approach to Carmel Valley Road, at an existing intersection of a private residential access road and Carmel Valley Road. Minimal impacts on communities and safety and to traffic operations on the existing residential access road approach to Carmel Valley Road at the Carmel Valley Road/Tularcitos Access Road intersection.

Table F-1: Summary of access route screening environmental constraints analysis

Criteria	Access Routes			
	Cachagua	**SHHA**	**Sleepy Hollow**	**Tularcitos**
Terrestrial Biology	Habitat impacts: 6.58 acres if Cachagua Road is widened; 3.23 acres if not Sensitive habitat impacts: 1.15 acres of blue oak and riparian vegetation if Cachagua Road is widened; 0.07 acres if not. Potential sensitive species (based on habitats; no previous surveys conducted for this route): California tiger salamander (FT, CSC), Carmel Valley malacothrix (CNPS 1B), Cooper's hawk (CSC), yellow warbler (CSC), and Monterey dusky-footed woodrat (CSC). Limited potential habitat for California red-legged frog (FT, CSC), southwestern pond turtle (CSC).	Habitat impacts: 2.50 acres Sensitive habitat impacts: 1.1 acres of blue oak and riparian vegetation. Potential sensitive species (based on habitats and some field observations): California tiger salamander (FT, CSC), California red-legged frog (FT, CSC), southwestern pond turtle (CSC), Carmel Valley malacothrix (CNPS 1B), Cooper's hawk (CSC), yellow warbler (CSC), and Monterey dusky-footed woodrat (CSC). Woodrats are known to occupy the area along Tularcitos Creek.	Habitat impacts: 1.68 acres Sensitive habitat impacts: 0.22 acres of blue oak and riparian vegetation. Potential sensitive species (based on potential habitats and earlier surveys): California tiger salamander (FT, CSC), California red-legged frog (FT, CSC), southwestern pond turtle (CSC), Cooper's hawk (CSC), yellow warbler (CSC), Monterey dusky-footed woodrat (CSC); and virgate eriastrum.	Habitat impacts: 2.23 acres Sensitive habitat impacts: 0.68 acres of blue oak and riparian vegetation. Potential sensitive species (based on potential habitats and earlier surveys): California tiger salamander (FT, CSC), California red-legged frog (FT, CSC), southwestern pond turtle (CSC), Cooper's hawk (CSC), yellow warbler (CSC), and Monterey dusky-footed woodrat (CSC). Woodrats are known to occupy the area along Tularcitos Creek.

SLEEPY HOLLOW ROUTE

Air Quality & Noise

The proposed access road section in the vicinity of the residential zone is approximately one mile (1600 meters) in length and the nearest residential receptor for air quality and noise impacts is approximately 200 feet (60 meters) from the access road section. To simulate a line source, the road section was subdivided into 8 x 80 meter segments for a maximum aspect ratio of 10 to 1. A detailed methodology is contained in the appendix to this report. Estimated impacts are as follows:

Air emissions from project activity:

- NO_x 0.43 lb/day
- CO 0.10 lb/day
- PM_{10} 16 lb/day

Maximum incremental pollutant concentrations over background:

- NO_x 0.27 µg/m^3
- CO 0.06 µg/m^3
- PM_{10} 4.1 µg/m^3

Attenuated noise levels from project activity:

- 75 dBA @ 60 meters

Aquatic Biology & Stream Crossings

There are three stream crossings along this route, at existing bridges and the concrete ford on the Carmel River. Two of them are on the Carmel River and one is at Tularcitos Creek. These have the potential to affect steelhead. There may be a possible benefit to steelhead in replacing the concrete ford.

Terrestrial Biology

A total of 1.68 acres are potentially affected by this Alternative, including 0.22 acre of sensitive habitat (Table F-2). (Acreages of the existing roads have been subtracted from the potentially affected vegetation acreages.) For comparison, habitat miles traversed by each Alternative are shown in Table F-3.

Table F-2: San Clemente Dam Alternate Access Routes
Vegetation Types Potentially Affected (Acres)

Vegetation Type	Total Sensitive Habitat (blue oak & riparian)	TOTAL	California Annual Grassland	Coast Live Oak	Blue Oak- Coast Live Oak Mix	Blue Oak	California Sycamore Riparian - Coast Live Oak Forest	California Sycamore Savanna	California Sycamore Forest	Central Coast Cottonwood-sycamore Riparian Forest	Narrow leaf Willow	Mixed Riparian	Blacksage	California Sagebrush - Blacksage	Chamise	Chamise - Blacksage	Mixed Scrub	Developed	Ruderal
Cachagua/Site 4	1.15	6.58	0.63	3.72	0.29	0.82						0.04		0.17	0.67	0.08	0.13	0.02	0.02
Cachagua	1.09	3.35		1.71	0.26	0.82									0.40	0.00	0.13	0.02	0.02
Site 4	0.07	3.23	0.63	2.01	0.03							0.04		0.17	0.26	0.08			
SHHA	1.10	2.50	0.20	0.73			0.02	0.05	0.12	0.70	0.21		0.12	0.10	0.12	0.07			0.07
Sleepy Hollow (San Clemente Drive)	0.22	1.68	0.24	0.83			0.00		0.12	0.10			0.12	0.07	0.12	0.07			0.01
Tularcitos	0.68	2.23	0.02	1.06			0.09		0.12	0.48			0.12	0.10	0.12	0.07			0.07

Table F-3. San Clemente Dam Alternate Access Routes
Vegetation Types Traversed (Miles)

Vegetation Type	Total Sensitive Habitat (blue oak & riparian)	TOTAL	California Annual Grassland	Coast Live Oak Forest	Blue Oak- Coast Live Oak Mix	Blue Oak	California Sycamore Riparian - Coast Live Oak Forest	California Sycamore Savanna	California Sycamore Forest	Central Coast Cottonwood-sycamore Riparian Forest	Narrow leaf Willow	Mixed Riparian	Blacksage	California Sagebrush - Blacksage	Chamise	Chamise - Blacksage	Mixed Scrub	Developed	Ruderal
Cachagua/Site 4	0.96	4.65	0.50	2.29	0.24	0.70						0.02			0.56	0.21	0.11	0.02	
Cachagua	0.94	3.09		1.54	0.24	0.70									0.34	0.14	0.11	0.02	
Site 4	0.02	1.56	0.50	0.75								0.02			0.22	0.07			
Tularcitos	1.12	5.42	0.08	2.34			0.04	0.00	0.52	0.57			0.46	0.40	0.49	0.28			0.25
SHHA	1.29	5.60	0.23	2.20			0.01	0.02	0.52	0.63	0.10		0.46	0.40	0.49	0.28			0.25
Sleepy Hollow (San Clemente Drive)	0.93	5.31	0.60	2.20					0.52	0.41			0.46	0.29	0.49	0.28			0.05
Tularcitos	1.12	5.42	0.08	2.34			0.04	0.00	0.52	0.57			0.46	0.40	0.49	0.28			0.25

Special-status terrestrial species potentially impacted on this Alternative include California tiger salamander (FT, CSC), California red-legged frog (FT, CSC), southwestern pond turtle (CSC), Cooper's hawk (CSC), yellow warbler (CSC), and Monterey dusky-footed woodrat (CSC).[1]

Traffic & Safety

Tables F-4 and F-5 describe the access routes and summarize their deficiencies, potential impacts, and potential mitigation measures. High-volume truck traffic would have a substantial quality of life impact on residents of Sleepy Hollow, a community accessed from Carmel Valley Road via San Clemente Drive. San Clemente Drive and Center Court Place roadway geometrics are marginal and motor vehicle, pedestrian, bicycle safety on these routes would be impacted. There may be potential impacts to San Clemente Drive and Center Court Place pavements. Sections of this route could be widened, including existing segments of the dam access roads located south of Sleepy Hollow. Traffic control measures would be required during periods of concentrated truck traffic on segments where only one-way traffic operations are possible. San Clemente Drive and Center Court Place should not be used for moderate or high volume truck operations due to the traffic related impacts to the quality of life of the residents of Sleepy Hollow.

SLEEPY HOLLOW HOMEOWERS ASSOCIATION ROUTE

Air Quality & Noise

The proposed access road section in the vicinity of the residential zone is approximately one mile (1600 meters) in length and the nearest residential receptor for air quality and noise impacts is approximately 500 feet (150 meters) from the access road section. To simulate a line source, the road section was subdivided into 8 x 80 meter segments for a maximum aspect ratio of 10 to 1. A detailed methodology is contained in the appendix to this report. Estimated impacts are as follows:

Estimated emissions from project activity:

- NO_x 0.43 lb/day
- CO 0.10 lb/day
- PM_{10} 16 lb/day

[1] FT = federally listed as threatened
CSC = California state species of concern
CNPS 1B = categorized by the California Native Plant Society as Plants rare or endangered in California and elsewhere.

Table F-4: Description of Alternative San Clemente Dam Access Routes

ACCESS ROUTE	ROUTE SEGMENT		ROAD TYPE	APPROXIMATE LENGTH	DAILY TRAFFIC VOLUME	DESIGN CHARACTERISTICS							
						EXISTING				FUTURE WITH PROJECT			
						LANES	WIDTH (FEET)	SHOULDERS	SURFACE	LANES	WIDTH (FEET)	SHOULDERS	SURFACE
1. Cachagua													
	Carmel Valley Road	SHHA - Cachagua Rd	Public-Rural Highway	2.5 miles	1200-2100	2	20 to 24	Minimal	Asphalt Conc.	2	20 to 24	Minimal	Asphalt Conc.
	Cachaqua Road	Carmel Valley Rd - Proposed Access Road	Public - Rural Collector	3.0 miles	760	2	16 to 24	Minimal	Asphalt Conc.	2	16 to 24	Minimal	Asphalt Conc.
	New Access Road	Cachagua Rd - Dam	Private - Dam Access	1.2 miles	-	Jeep Trail			Dirt	2	25	0	Gravel
	New Access Road	Cachagua Rd - Dam	Private - Dam Access	0.6 miles	-	N/A	N/A	N/A	N/A	2	25	0	Gravel
2. SHHA													
	SHHA Access Road	Carmel Valley Rd - San Clemente Dr.	Private - Dam Access	1.0 miles	-	N/A	N/A	N/A	N/A	2	22	0	Gravel
		Dam Access Road											
	Dam Access Road	San Clemente Dr - Dam	Private - Dam Access	2.0-3.0 miles	-	1-2	Minimum for 1-way traffic	0	Dirt	1-2	Minimum for 1-way traffic	0	Dirt
3. Sleepy Hollow													
	Carmel Valley Road	SHHA - San Clemente Dr.	Public-Rural Highway	0.6 miles	2100	2	20 to 24	Minimal	Asphalt Conc.	2	20 to 24	Minimal	Asphalt Conc.
	San Clemente Drive	Carmel Valley Road - Center Court Place	Private -Residential	0.4 miles	130-230	2	18	Minimal	Asphalt Conc.	2	18	Minimal	Asphalt Conc.
	Center Court Place	San Clemente Dr. - San Clemente Dr.	Private -Residential	1.0 miles	Minimal	1	12	0	Asphalt Conc./Dirt	1-2	12-22	0	Asphalt Conc./Gravel
		Dam Access Road											
	Dam Access Road	San Clemente Dr - Dam	Private - Dam Access	2.0-3.0 miles	-	1-2	Minimum for 1-way traffic	0	Dirt	1-2	Minimum for 1-way traffic	0	Dirt
4. Tularcitos													
	Carmel Valley Road	SHHA - Tularcitos Access Rd.	Public-Rural Highway	0.5 miles	2100	2	20 to 24	Minimal	Minimal	2	20 to 24	Minimal	Asphalt Conc.
	Tularcitos Access Road	Carmel Valley Rd - San Clemente Dr.	Private - Dam Access	1.1 miles		N/A	N/A	N/A	N/A	2	22	0	Gravel
		Dam Access Road											
	Dam Access Road	San Clemente Dr - Dam	Private - Dam Access	2.0-3.0 miles	-	1-2	Minimum for 1-way traffic	0	Dirt	1-2	Minimum for 1-way traffic	0	Dirt

1 Future design based upon designs prepared and/or proposed in conjunction with previous San Clemente Dam Seismic Retrofit planning and design studies.
2 Description of the access route begins at the Carmel Valley Road/SHHA Access Road intersection.
3 SHHA: Sleepy Hollow Homeowners Association.

Table F-5: Summary of Deficiencies, Potential Impacts and Mitigation for Access Routes

ACCESS ROUTE	DEFICIENCIES/POTENTIAL IMPACTS	POTENTIAL MITIGATION MEASURES
1. Cachagua	1. Deficient sight distance at the CVR/Cachagua Rd I/S.	1. Minor widening of Carmel Valley Road and/or re-grade the embankment located on the south side of CVR east of Cachagua Rd.
	2. Deficient sight distance at the Cachagua/New Dam Access Rd I/S.	2. Re-grade the embankment located on the east side of Cachagua Rd north of the existing jeep trail to improve sight distance.
	3. Poor horizontal alignment at several locations on Cachagua Rd.	3. Minor widening where possible; limit trucks on Cachagua Rd to single unit trucks with truck escort.
	4. Inadequate width for two-way travel by trucks.	4. Minor widening where possible; otherwise limit trucks on Cachagua Rd to single unit trucks with escort.
	5. Potential for pavement damage to Cachagua Rd.	5. Pavement maintenance as required and possible overlay.
	6. Adds construction related traffic to a rural collector road with poor geometrics increasing the potential for collisions.	6. No direct mitigation possible other than implementation of No. 3 above.
	7. Cachagua Road is not suitable for medium and high truck volume conditions.	
2. SHHA	1. Adds a new intersection to CVR.	1. Design the CVR/SHHA intersection to meet Caltrans and County of Monterey design standards including standards for sight distances. This will require the access road be located in the center of a moderate bend in CVR, at the location of three existing trees. Minor re-grading of the embankment located on the north side of CVR east of the access road will be required.
	2. The proposed design includes a single lane bridge over Tularcitos Creek and two horizontal curves immediately south of CVR.	2. This proposed design is marginal for low volume truck haul and dam access conditions. Traffic control may be necessary during active construction periods. Under medium and high truck volume conditions, widening to allow two-way operations is recommended.
	3. Route maintains existing dam access roads south of San Clemente Drive.	3. Significant improvement of the dam access roads is not anticipated.
	4. This route could potentially be used as an alternative to the Tularcitos Access Road for sediment disposal truck haul trips to Site 6R.	4. Widening to allow two-way operations is recommended if the road is used for the hauling of dam sediment. Also, left turn channelization and a right turn acceleration lane should be provided at the CVR/SHHA intersection with medium and high truck volume conditions.
3. Sleepy Hollow	1. Adds construction traffic to a private road used to access a residential subdivision.	1. No mitigation possible.
	2. Marginal roadway geometrics including widths, shoulders, sight distances and facilities for pedestrians and bicyclists.	2. Minor widening where possible. Traffic control and truck escort required during low truck volume construction activities. Construction of a separate path for pedestrians and bicyclists recommended including a pedestrian/bicyclist bridge over Tularcitos Creek.
	3. Route maintains existing dam access roads south of San Clemente Drive.	3. Significant improvement of the dam access roads is not anticipated.
	4. Potential for pavement damage to San Clemente Drive and Center Court Place.	5. Pavement maintenance as required and possible overlay.

Table F-5: Summary of Deficiencies, Potential Impacts and Mitigation for Access Routes

ACCESS ROUTE	DEFICIENCIES/POTENTIAL IMPACTS	POTENTIAL MITIGATION MEASURES
	5. This access is not suitable for medium and high truck volume conditions.	
4. Tularcitos	1. Adds a new intersection approach leg to CVR, but at the location of an existing intersection.	1. Design the CVR/SHHA intersection to meet Caltrans and County of Monterey design standards.
	2. The proposed design includes a single lane bridge over Tularcitos Creek and two horizontal curves immediately south of CVR.	2. This proposed design is marginal for low volume truck and dam access conditions. Traffic control may be necessary during active construction periods. Under high volume conditions, including sediment haul operations to Site 6R, widening to allow two-way operations is recommended.
	3. Route maintains existing dam access roads south of San Clemente Drive.	3. Significant improvement of the dam access roads is not anticipated.

Notes:
CVR: Carmel Valley Road.

Maximum incremental pollutant concentrations over background:

- NO_x 0.27 µg/m^3
- CO 0.06 µg/m^3
- PM_{10} 4.1 µg/m^3

Attenuated noise levels from project activity:

- 67 dBA @ 150 meters

Aquatic Biology & Stream Crossings

This access route has three stream crossings. Two occur at the existing bridge and concrete ford on the Carmel River, and one new crossing would be constructed at Tularcitos Creek. These have the potential to affect steelhead. There may be a possible benefit to steelhead in replacing the concrete ford.

Terrestrial Biology

A total of 2.5 acres are potentially affected by this Alternative, including 1.10 acres of sensitive habitat (Table F-2). (Acreages of the existing roads have been subtracted from the potentially affected vegetation acreages.) For comparison, habitat miles traversed by each Alternative are shown in Table F-3.

Special-status terrestrial species potentially impacted on this Alternative include California tiger salamander (FT, CSC), California red-legged frog (FT, CSC), southwestern pond turtle (CSC), Cooper's hawk (CSC), yellow warbler (CSC), and Monterey dusky-footed woodrat (CSC). Monterey dusky-footed woodrat nests have been reported from this reach of Tularcitos Creek.

Traffic & Safety

Tables C-4 and C-5 describe the access routes and summarize their deficiencies, potential impacts, and potential mitigation measures. This access route adds a new intersection to Carmel Valley Road. The intersection would need to be designed to appropriate County of Monterey design standards. Under low construction traffic conditions, left and right turn channelization would probably not be required at the Carmel Valley/SHHA Access Route intersection, although the intersection should be designed to serve the turning requirements of large trucks that will use the intersection. Under moderate and high traffic volume conditions, left turn and right turn channelization would be required at the intersection. The SHHA route would use only private roads south of Carmel Valley Road. Therefore, potential traffic related impacts to existing residential streets and residential quality of life would be avoided. Traffic control measures would be required during periods of concentrated truck traffic on segments where only one-way traffic operations are possible. This would primarily occur on sections of the existing dam access roads located south of Sleepy Hollow.

TULARCITOS ROUTE

Air Quality & Noise

The proposed access road section in the vicinity of the residential zone is approximately 0.95 mile (1520 meters) in length and the nearest residential receptor for air quality and noise impacts is approximately 200 feet (60 meters) from the access road section. To simulate a line source, the road section was subdivided into 8 x 80 meter segments for a maximum aspect ratio of 10 to 1. A detailed methodology is contained in the appendix to this report. Estimated impacts are as follows:

Air emissions from project activity:

- NO_x 0.41 lb/day
- CO 0.09 lb/day
- PM_{10} 15 lb/day

Maximum incremental pollutant concentrations over background:

- NO_x 0.27 $\mu g/m^3$
- CO 0.06 $\mu g/m^3$
- PM_{10} 4.1 $\mu g/m^3$

Attenuated noise levels from project activity:

- 75 dBA @ 60 meters

Aquatic Biology & Stream Crossings

This access route has three stream crossings. Two occur at the existing bridge and concrete ford on the Carmel River, and one new crossing would be constructed at

Tularcitos Creek. These have the potential to affect steelhead. There may be a possible benefit to steelhead in replacing the concrete ford.

TERRESTRIAL BIOLOGY

A total of 12.23 acres are potentially affected by this Alternative, including 0.68 acre of sensitive habitat (Table F-2). (Acreages of the existing roads have been subtracted from the potentially affected vegetation acreages.) For comparison, habitat miles traversed by each Alternative are shown in Table F-3.

Special-status terrestrial species potentially impacted on this Alternative include California tiger salamander (FT, CSC), California red-legged frog (FT, CSC), southwestern pond turtle (CSC), Cooper's hawk (CSC), yellow warbler (CSC), and Monterey dusky-footed woodrat (CSC). Monterey dusky-footed woodrat nests have been reported from this reach of Tularcitos Creek.

Traffic & Safety

Tables F-4 and F-5 describe the access routes and summarize their deficiencies, potential impacts, and potential mitigation measures. This access route adds a new intersection approach to Carmel Valley Road, at an existing intersection of a private residential access road and Carmel Valley Road. The intersection would need to be designed to meet County of Monterey intersection design standards. As with the SHHA route, this route would use private roads between Carmel Valley Road and the dam. Therefore, there would be no traffic related impacts to the quality of life of any residential development. The impact to traffic turning between Carmel Valley Road and the existing residential access road/driveway located on the north side of Carmel Valley Road at the intersection of the Tularcitos Access Route with Carmel Valley Road should be minimal under low volume construction traffic conditions. There would be sufficient capacity at the intersection to serve the low volume construction traffic as well as the traffic generated by the residential development served by the residential access road/driveway. Under moderate and high traffic volume conditions, left turn and right turn channelization would be required at the intersection.

CACHAGUA ROUTE

Air Quality & Noise

The proposed access road section in the vicinity of the residential zone is approximately 1.25 miles (2000 meters) in length and the nearest residential receptor for air quality and noise impacts is approximately 500 feet (150 meters) from the access road section. To simulate a line source, the road section was subdivided into 8 x 80 meter segments for a maximum aspect ratio of 10 to 1. A detailed methodology is contained in the appendix to this report. Estimated impacts are as follows:

Air emissions from project activity:

- NO_x 0.53 lb/day
- CO 0.13 lb/day
- PM_{10} 20 lb/day

Maximum incremental pollutant concentrations over background:

- NO_x 0.34 µg/m^3
- CO 0.08 µg/m^3
- PM_{10} 5.1 µg/m^3

Attenuated noise levels from project activity:

- 67 dBA @ 150 meters

Aquatic Biology & Stream Crossings

This access route has no stream crossings. No steelhead impacts are expected.

Terrestrial Biology

A total of 6.58 acres are potentially affected by this Alternative, including 1.15 acres of sensitive habitat (Table F-2). However, most of this sensitive habitat is blue oak woodland along Cachagua Road. If road improvements along this road are limited in extent, then much of this acreage may not be affected by the project. The affected acreage from Cachagua Road to the reservoir includes 0.07 acre of sensitive habitats in a total affected acreage of 3.23 acres. (Acreages of the existing roads have been subtracted from the potentially affected vegetation acreages.) For comparison, habitat miles traversed by each Alternative are shown in Table F-3.

Special-status terrestrial species potentially impacted on this Alternative include California tiger salamander (FT, CSC), California red-legged frog (FT, CSC), southwestern pond turtle (CSC), Carmel Valley malacothrix (CNPS 1B), Cooper's hawk (CSC), yellow warbler (CSC), and Monterey dusky-footed woodrat (CSC). Although habitats for the California red-legged frog and western pond turtle are limited on this route, it may provide more potential habitat for the California tiger salamander than the other routes. Unlike the other Alternatives, no focused wildlife surveys have been conducted on this route.

TRAFFIC & SAFETY

Tables F-4 and F-5 describe the access routes and summarize their deficiencies, potential impacts, and potential mitigation measures. Cachagua Road has poor horizontal and vertical alignments. Cachagua Road is 18 to 20 feet in width, with some sections as narrow as 16 feet. Sight distance at some locations on Cachagua Road is limited due to horizontal and vertical curvatures. Cachagua Road motor vehicle, pedestrian, and bicycle safety would be impacted by construction-related traffic. Traffic control will be required at locations where two-way traffic cannot be provided and road

widening is not feasible. Sight distance is restricted at the Carmel Valley Road/ Cachagua Road intersection and at the Cachagua Road/Jeep Trail/Dam Access Road intersection. Embankment re-grading may be required at these locations to improve sight distance. Construction related trucking operations may damage the Cachagua Road pavement. Under moderate and high levels of construction truck traffic, impacts to the Cachaqua Road pavement structure very likely would be significant. An extensive traffic control plan and extensive roadway improvements would be required if Cachagua Road were to be used by moderate and high levels of construction traffic.

1.4 RANKING

Table F-6 provides a comparative ranking of the access route Alternatives. Each row of the table presents the criteria used in environmental constraints analysis; the table columns present each of the routes evaluated. Each of the four route Alternatives routes are ranked (1-4) for each of the criteria. In addition, the table notes whether the constraints of the route Alternative are considered "low", "medium", or "high."

- "Low" constraints are considered not to present important environmental concerns.
- "Medium" constraints are considered to present environmental concerns of some importance, which may require mitigation.
- "High" constraints are considered to present important environmental concerns, and to require mitigation.

The ranking does not imply anything about the constraints an access route may have. Ranking simply distinguishes among the four routes on an ordinal scale. For example, two routes may have the same level of constraints but one may be ranked above the other. At the bottom of the table, the simple sum of ranking scores is given, and the Core Team decision (to eliminate or select the Alternative) is explained.

Air Quality

The Monterey Bay Unified Air Pollution Control District (MBUAPCD, District) is responsible for air monitoring, permitting, enforcement, long-range air quality planning, regulatory development, education and public information activities related to air pollution. Ambient air quality background data was obtained from the District for use in the screening analysis.

Table F-6: Access route screening environmental constraints ranking

Ranking	Access Route			
	Cachagua	**SHHA**	**Sleepy Hollow**	**Tularcitos**
Air Quality	2. Medium constraints (PM_{10} maximum concentration is 9% of background)	1. Medium-low constraints (PM_{10} maximum concentration is 7% of background)	1. Medium-low constraints (PM_{10} maximum concentration is 7% of background)	1. Medium-low constraints (PM_{10} maximum concentration is 7% of background)
Noise	1. Medium-high constraints (dBA is 181% of background)	1. Medium-high constraints (dBA is 181% of background)	2. High constraints (dBA is 202% of background)	2. High constraints (dBA is 202% of background)
Roads & Bridges	3. High constraints (Potential impacts to pavement structure.)	1. Low constraints (New access road avoids use of existing public and private residential roads for dam access.)	2. High constraints (Potential impacts to pavement structure.)	1. Low constraints (New access road avoids use of existing public and private residential roads for dam access.)
Traffic & Safety	3. High constraints (Adds construction traffic to a rural road with poor roadway design features.)	1. Low constraints (New access road avoids use of existing public and private residential roads for dam access.)	2. High Constraints (Adds construction traffic to a private residential road with minimum roadway design features including no facilities for pedestrians and bicyclists and a one-lane bridge.)	1. Low Constraints (New access road avoids use of existing public and private residential roads for dam access.)
Terrestrial Biology & Stream Crossings	3. High constraints (more undisturbed habitat and habitat for sensitive species)	4. High constraints (most undisturbed riparian habitat and habitat for sensitive species)	1. Low constraints (least potentially affected habitat acreage and sensitive species)	2. Medium constraints (potentially affected habitat and sensitive species)
Outcome of Ranking & Selection	12 points (required to support the Site 4R sediment transport and disposal selection for those dam alternatives that move sediment)	8 points (eliminated due to terrestrial impacts)	8 points (eliminated for alternatives with heavy traffic requirements due to traffic, roads, and safety impacts, but retained for the dam removal alternative)	7 points (selected for the dam thickening, dam notching and Carmel River reroute alternatives)

The proximity of the Sleepy Hollow and Tularcitos routes to the nearest receptor is about 60 meters, while the SHHA and Cachagua routes nearest-receptor proximity is about 150 meters, judging by maps and aerial photos. The residential sections of the Sleepy Hollow, Tularcitos, and SHHA routes are all about one mile (1600 meters) in overall length, while the Cachagua route is slightly longer, about 1.25 miles (2000 meters). Since the SHHA route combines a shorter emitting distance (1600 meters) and a longer receptor distance (150 meters), it has the apparent lowest air quality impact among the four Alternatives, on a Gaussian basis. This is also true for simple noise attenuation.

Ambient air quality background levels used for all of the routes are as follows (MBUAPCD air monitoring station name, year, averaging time):

- NO_x 266 µg/m^3 (Salinas #3, 2004, max 1-hour)
- CO 4257 µg/m^3 (Salinas Natividad Road #2, 1996, max 1-hour)
- PM_{10} 57 µg/m^3 (Carmel Valley-Ford Road, 1999, max 24-hour)

1 – Sleepy Hollow Route, SHHA Route, and Tularcitos Route

Rationale: This rating is based on the result that each of these routes have the same estimated ground level pollutant concentration increment for criteria pollutants (NO_X, CO, PM_{10}). The estimated PM_{10} maximum concentration increment is about 7% of background in all three cases. All other pollutant impacts are small compared to background.

2 – Cachagua Route

Rationale: This route has a marginally greater estimated PM_{10} concentration increment, about 9% of background. Estimated ground level pollutant concentration increments for criteria pollutants (NO_X, CO, PM_{10}) are also slightly higher, but still small compared to background.

Noise

During the construction phase of the dam retrofit, haul truck traffic noise level will vary depending on the quantities and frequency of trucks which operate at any particular time. A maximum noise level for typical trucks in decibels (dBA) was correlated from industrial hygiene and noise measurement reference tables for characteristic industrial noise sources at reference distances.

Noise background in the residential zone:

- 37 dBA @ 100 m (RDEIR Table 4.7-2, 1997)

1 – Cachagua and SHHA Routes

Rationale: These routes both increase noise levels to 180% of background, from 37 to 67 dBA for a receptor distance of 500 feet (150 meters).

2 – Sleepy Hollow and Tularcitos Routes

Rationale: These routes have marginally greater noise impacts, about 200% of background, from 37 to 75 dBA for a receptor distance of 200 feet (60 meters).

Aquatic Biology & Stream Crossings

1 – Cachagua Route

Rationale: This route has no stream crossings and no steelhead impacts.

2 – SHHA Route, Sleepy Hollow Route and Tularcitos Route

Rationale: These routes each have two existing stream crossings, a new crossing at Tularcitos Creek, and potential steelhead impacts.

Terrestrial Biology

1 – Sleepy Hollow Route

Rationale: This Alternative has the lowest total acreage of potentially affected habitat, and the lowest acreage of sensitive habitat (unless impacts from the Cachagua Road Alternative are limited to the off-road section).

2 – Tularcitos Route

Rationale: Based on the acreage of habitat potentially affected, this Alternative is rated second.

3 – Cachagua Route

Rationale: Most potential impacts to blue oaks along Cachagua Road can be avoided if roadwork is limited, and the extent of sensitive habitat between Cachagua Road and the reservoir is small. The probable lack of impacts to sensitive habitats on this section partly offsets the acreage of undisturbed wildlife habitat potentially affected. Therefore, this Alternative is rated third.

4 – SHHA Route

Rationale: This access route has the largest acreage of potentially affected sensitive habitat (assuming that impacts to all or most of the blue oaks adjacent Cachagua Road would be avoided), and the second largest acreage of total habitat affected.

Traffic & Safety

Table C-7 presents a summary impact rating and ranking of the access routes for traffic concerns.

1 – SHHA and Tularcitos Routes

Rationale: These routes both have low constraints for traffic and safety. They both entail new access roads that would be private roads. The use of existing public and private residential roads for dam access would be avoided.

Table F-7: Traffic Ranking of San Clemente Dam Alternative Access Routes

ACCESS ROUTE	ROUTE SEGMENT		ROAD TYPE	APPROXIMATE LENGTH	DAILY TRAFFIC VOLUME	IMPACT RATING				ACCESS ROUTE RATING (RATING x SEGMENT LENGTH)				
						IMPACT TO RESIDENTIAL DEVELOPMENT		ROADWAY GEOMETRICS	PAVEMENT IMPACTS	IMPACT TO RESIDENTIAL DEVELOPMENT		ROADWAY GEOMETRICS	PAVEMENT IMPACTS	TOTAL SCORE
						DIRECT	INDIRECT			DIRECT	INDIRECT			
1. Cachagua														
	Carmel Valley Road	SHHA Access - Cachagua Rd	Public-Rural Highway	2.5 miles	1200-2100	0	0	2	2	0	0	5	5	10
	Cachagua Road	Carmel Valley Rd - Proposed Access Road	Public - Rural Collector	3.0 miles	760	0	5	5	4	0	15	15	12	42
	New Access Road	Cachagua Rd - Dam	Private - Dam Access	1.2 miles	-	0	0	0	1	0	0	0	1	1
	New Access Road	Cachagua Rd - Dam	Private - Dam Access	0.6 miles	-	0	0	0	1	0	0	0	1	1
										0	15	20	19	54
2. SHHA														
	SHHA Access Road	Carmel Valley Rd - San Clemente Dr. Dam Access Road	Private - Dam Access	1.0 miles	-	0	0	1	1	0	0	1	1	2
	Dam Access Road	San Clemente Dr - Dam	Private - Dam Access	2.0-3.0 miles	-	0	0	5	1	0	0	15	3	18
										0	0	16	4	20
3. Sleepy Hollow														
	Carmel Valley Road	SHHA Access - San Clemente Dr.	Public-Rural Highway	0.6 miles	2100	0	0	2	2	0	0	1	1	2
	San Clemente Drive	Carmel Valley Road - Center Court Place	Private -Residential	0.4 miles	130-230	5	5	4	4	2	2	2	2	7
	Center Court Place	San Clemente Dr. - End	Private -Residential	0.2 miles	Minimal	5	5	4	3	1	1	1	1	3
	New Access Road	End of Center Court Place to Dam Access Road	Private - Dam Access	0.5 miles	-	0	0	0	1	0	0	0	1	1
	Dam Access Road	San Clemente Dr - Dam	Private - Dam Access	2.0-3.0 miles	-	0	0	5	1	0	0	15	3	18
										3	3	19	7	32
4. Tularcitos														
	Carmel Valley Road	SHHA Access - Tularcitos Access Rd.	Public-Rural Highway	0.5 miles	2100	0	0	2	2	0	0	1	1	2
	Tularcitos Access Road	Carmel Valley Rd - San Clemente Dr. Dam Access Road	Private - Dam Access	1.1 miles		0	0	1	1	0	0	1	1	2
	Dam Access Road	San Clemente Dr - Dam	Private - Dam Access	2.0-3.0 miles	-	0	0	5	1	0	0	15	3	18
										0	0	17	5	22

Notes:

1. A high score indicates traffic related environmental impacts and constraints are high; a low score indicates that traffic related environmental impacts and constraints are low.
2. Rating Scale:
   - 0 = No impacts anticipated.
   - 1 = Very low level impacts; impacts can be mitigated.
   - 2 = Low level impacts; impacts can be mitigated.\
   - 3 = Moderate level impacts; impacts can be mitigated
   - 4 = High level/significant impacts; impacts can be mitigated.
   - 5 = High level/significant impacts; impacts probably can not be mitigated.
3. Direct Residential Impact: Alternative adds construction related traffic to a local or collector road with residential homes directly fronting onto and accessed from the segment.
4. Indirect Residential Impact: Alternative adds construction related traffic to a segment of a local residential or collector road.
5. Ratings based on a low volume of truck traffic.

2 – Sleepy Hollow Route

Rationale: This route has high constraints. It would add traffic to a rural residential road with poor roadway design features traversing a residential community.

3 – Cachagua Route

Rationale: This route has high constraints. It would add traffic to a rural road, 3 miles in length, with poor roadway design features.

Appendix G

SAN CLEMENTE DAM SCREENING OF SEDIMENT DISPOSAL SITES

DRAFT – PRELIMINARY

M E M O R A N D U M

MWH
MONTGOMERY WATSON HARZA

To:	John Klein and Fred Feizollahi (Cal-Am Water) Dave Gutierrez (DSOD), Jeremy Pratt (Entrix)	**Date:**	March 10, 2005
From:	Alberto Pujol and Dan Wade	**Ref.:**	1004231.010106
Subject:	San Clemente Dam Screening of Sediment Disposal Sites		

BACKGROUND

San Clemente Reservoir has been estimated to contain approximately 2.5 million cubic yards of sediment (MEI, 2003). The sediment consists of sandy gravel, gravelly sand, sand, silty sand, and sandy silt. The finer-grained sediment is located nearest to the dam in both arms of the reservoir, and the coarser (more gravelly) materials are encountered in the upper reaches of the Carmel River arm of the reservoir.

MWH was asked to perform a screening analysis of potential sediment disposal sites. The purpose of the screening analysis is to provide engineering input to the alternatives analysis being performed by Entrix for the EIR/EIS and to recommend selection (based on engineering considerations) of a potential sediment disposal site for use with the dam removal alternative and a potential sediment disposal site (the same or a different one) for use with the dam notching alternative. Under a separate scope Entrix will perform environmental reviews of the sites and develop the appropriate mitigation measures.

The required sediment disposal capacity for the dam removal alternative is approximately 2.5 million cubic yards. For the dam notching alternative, the estimated volume of sediment to be removed is approximately 1.5 million cubic yards (MEI, 2005).

This draft memorandum presents the results of the screening analysis. The presentation is organized as follows:

- Potential sediment disposal sites are described.
- Potential sediment excavation methods are summarized.
- Reasonable sediment removal rates and the resulting schedule for removal of sediments are outlined.
- Potential sediment transport modes are described.
- Potential power supply sources for sediment transport are discussed.
- Typical activities related to sediment disposal site preparation and construction operations are described.

- Land ownership considerations are briefly summarized.
- Comparative sediment disposal cost estimates are summarized.
- An assessment is made of the various sediment disposal alternatives.

POTENTIAL SEDIMENT DISPOSAL SITES

Previous studies by DWR identified potential sediment disposal Sites 1, 2A through 2E, 3, 4, 5 and 6 (DWR, 2002). For this assessment the following potential sites were evaluated:

- The site near the Carmel Valley Filter Plant (referred to as Site 1 in previous project documentation), in combination with a site across the Carmel River from the Filter Plant if additional capacity is required. This latter site (Site 2A) is occupied by the Stone Pine horse track, horse stables, and a barn.
- A typical upstream canyon site in the vicinity of the site previously designated as Site 4.
- An off-site disposal site within Chupines Ranch in the vicinity of the site previously designated as Site 6.

The general locations of these sites are shown on Figure 1. A brief site visit of the four sites was performed on February 8, 2005. A summary description of each site is provided below:

Site 1

Site 1, located approximately 2,400 feet northeast of the Carmel Valley Filter Plant, appears to be predominantly formed by an alluvial terrace just south of the confluence of the Carmel River and Tularcitos Creek. The site is bound by the Carmel River to the west and by a narrow rocky knoll along the northeast side that separates the site from the Tularcitos Creek channel. The site area is relatively level, with ground at elevations 340 to 345 feet approximately. During our visit, we visually estimated the ground surface to be approximately 8 feet above the Carmel River water level. On its southeast side, the sediment pile would abut a higher terrace, with ground at elevations 405 to 410 feet approximately, where an estate and tennis courts are located.

Existing access to Site 1 is via San Clemente Drive and the Carmel Valley Filter Plant. A dirt road along the western edge of the site provides access to two Cal-Am wells. While it appears that the wells would not be within the footprint of the sediment fill, a power line and miscellaneous piping would need to be relocated.

Use of Site 1 as a sediment disposal or transfer site would require construction of a new access road between the site and Carmel Valley Road. The new road would cross Tularcitos Creek over a new bridge and intersect Carmel Valley Road about 800 feet west of San Clemente Drive. The road would tentatively consist of a 22-foot-wide graded section with a 3-foot drainage ditch, and surfaced with 6 inches of Class II base rock.

A plan of Site 1 is shown on Figure 2, and a capacity curve is shown on Figure 3. The footprint area is approximately 20 acres. The maximum practical level of the sediment pile is estimated to

be at approximately elevation 400 feet, resulting in a maximum capacity of about 1.2 million cubic yards of sediment. This maximum practical level is predicated on the top of the sediment pile being only a few feet below the terrain where the aforementioned estate is located.

Site 2A

Site 2A is located approximately 2,800 north of the Carmel Valley Filter Plant, on the west side of the Carmel River and across the river from Site 1. The sediment pile would occupy a level area that may also be an alluvial terrace deposit. The site lies at elevations 340 to 345 feet approximately. At its north and south ends, the site is bound by two flat promontories that jut into the river valley. The northern promontory is developed and is relatively level at elevation 390 to 395 feet. The southern promontory lies predominantly at elevation 425 feet approximately. Along the west side, the sediment pile would abut a steep slope that crests at about elevation 490 feet.

Site 2A contains four horse stables, a barn, a horse track, and a looping dirt road. These facilities would need to be removed and could potentially be relocated to the top of the sediment pile at the completion of sediment placement operations.

Existing access to Site 2A is via a gated entrance. Placement of sediment at Site 2A would require the construction of a suspended span across the Carmel River, between Sites 1 and 2A. The span would support the sediment delivery equipment, whether conveyor belt or pipelines. The existing driveway could conceivably be used to provide access for construction personnel and for the equipment in site preparation activities.

A plan of Site 2A is shown on Figure 2, and a capacity curve is shown on Figure 3. The footprint area is approximately 17 acres. The maximum practical level of the sediment pile is estimated to be at approximately elevation 425 feet. At this elevation, the top of the pile would create a reasonably level surface at the same level as the southern promontory and present the potential for re-establishing the horse stables and horse track at the higher elevation. As outlined, the pile has a maximum capacity of about 1.3 million cubic yards of sediment.

The toe-to-toe distance between the two sediment piles at Sites 1 and 2A is approximately 420 feet. Hydraulic modeling of the Carmel River and Tularcitos Creek during selected flow events would need to be performed to verify that the sediment piles at Sites 1 and 2A would not significantly impact hydraulic conditions upstream or downstream of the sites. Just downstream of the sediment piles and of the confluence with Tularcitos Creek, the Carmel River narrows down to less than 250 feet. It is believed that this relatively narrow gorge would control flood water levels in this area and that the sediment piles would not have a significant impact on flood water levels downstream of the site. During extreme flood events, the sediment piles might cause a minor rise in flood water levels in the immediate vicinity of the sediment piles (upstream of the gorge). This effect would have to be evaluated by hydraulic modeling.

Site 4R

Site 4R is located in a relatively steep, undeveloped, forested ravine approximately 3,500 feet east of San Clemente Reservoir. This ravine is located immediately south of another ravine where Site 4 was located during previous sediment disposal studies (DWR, 2002). Site 4R is preferred over Site 4 because of the following reasons:

- The previously identified Site 4 is located in a very narrow, forested ravine that carries a significant seasonal stream and with very steep side slopes between the site and the reservoir.

- The ravine where Site 4R is located does not appear to flow other than during storm events and is somewhat wider and the hillside slopes between the reservoir and Site 4R are flatter and more accessible than those leading to Site 4.

Based on observations made during the February 8 site visit, the location for this potential sediment pile site was thus relocated from Site 4 to Site 4R.

Existing access to the ravine where Site 4R would be located is via a jeep trail that begins at the Cachagua Grade. The jeep trail would need to be improved significantly to enable the mobilization of construction equipment to the site and the reservoir.

A plan of Site 4R is shown on Figure 4, and a capacity curve is shown on Figure 5. As shown on Figure 5, the maximum capacity of the site is undetermined but is well in excess of the estimated required volume of 2.5 million cubic yards. The toe of the sediment pile would be located at approximately elevation 920 feet. The top of the sediment pile would be at about elevation 1,150 feet for complete dam removal or at about elevation 1,110 feet for a dam notching alternative. The footprint area of the sediment pile would be approximately 23 acres. The watershed area tributary to the sediment pile site is approximately 252 acres.

Site 6R

Site 6R is located in a relatively steep, undeveloped, ravine approximately 2.1 miles northeast of Carmel Valley Road on the Chupines Creek valley. This ravine is located immediately west of where Site 6 was located during previous sediment disposal studies. Site 6R is preferred over Site 6 because of the following reasons:

- Site 6 was located across Chupines Creek, a significant permanent stream with a drainage area of approximately 14 square miles, and would require major water diversion works. Site 6R, on the other hand, occupies a small box canyon that does not appear to flow other than during storm events.

- During our February 8 site visit, the landowner, Mr. Bob Wilson, indicated potential willingness to dedicate the Site 6R box canyon to sediment disposal but expressed adamant opposition to the use of Site 6.

Based on observations made during the February 8 site visit, the location for this potential sediment pile site was thus relocated from Site 6 to Site 6R.

Existing access to the ravine where Site 6R would be located is via a dirt road that begins at Carmel Valley Road and serves Chupines Ranch. This road would need to be improved to enable the mobilization of construction equipment to the site.

A plan of Site 6R is shown on Figure 6, and a capacity curve is shown on Figure 7. As shown on Figure 7, the maximum capacity of the site is undetermined but exceeds the estimated required volume of 2.5 million cubic yards. The toe of the sediment pile would be located at approximately elevation 800 feet. The top of the sediment pile would be at about elevation 1,020 feet for complete dam removal or at about elevation 965 feet for a dam notching alternative. The footprint area of the sediment pile would be approximately 23 acres. The watershed area tributary to the sediment pile site is approximately 118 acres.

Other Sites Previously Identified

Other potential sediment disposal sites identified in a previous mapping study (DWR, 2002) include those referred to as Sites 2B through 2E, 3 and 5. These sites were only briefly considered and dismissed from further evaluation for purposes of this screening study. Sites 2B through 2E appear on the map to be small and of limited (and insufficient) capacity. Site 3 is located on a box canyon upstream of the dam and is thus somewhat comparable to Site 4R. However, Site 3 is much farther from the reservoir and at a much higher elevation than Site 4R. Therefore, other factors being equal, disposal of sediment at Site 3 would be significantly costlier than at Site 4R. Lastly, during our site visit we observed the area depicted as Site 5. This area consists of a steep slope overlooking Carmel River and appears to be unsuitable for sediment storage. Therefore, Site 5 was dismissed from consideration as well.

In a separate memorandum, MWH evaluated the potential for commercial (off-site) use of the sediment from San Clemente Reservoir (MWH, 2005). It was concluded that a feasible approach for cost effective development of mineral resources in the sediment now stored in the reservoir does not exist at this time. While the sediment could be processed into products that have commercial value, this value is significantly and completely offset by the incremental processing and transportation costs involved. Therefore, it was concluded that there is not a positive benefit-cost ratio for selling the sediment based on current market conditions.

SEDIMENT EXCAVATION METHODS

Sediment excavation methods considered for this analysis include (1) mechanical excavation using conventional earthmoving equipment, and (2) hydraulic dredging using a suction dredge. These are described below.

Mechanical Excavation

Excavation of sediment above the water table would likely be performed using self-loading scrapers or similar self-propelled excavating equipment. The scrapers would transport the

material to a centralized stockpile area within the reservoir area, where the material would be allowed to drain further. The exact location of the centralized stockpile area would depend on the final destination of the sediment. If the sediment is to be disposed at either Site 1/2A or 6R, the stockpile area would be adjacent to the right abutment of the dam; from there, the material would be loaded to a conveyor as conceptually shown on Appendix D of Entrix (2004). On the other hand, if the material is to be disposed at Site 4R, the stockpile would be located at the mouth of the ravine where Site 4R is located; from there, the material would be loaded onto trucks or a conveyor for transport to Site 4R.

Both the Carmel River and the San Clemente Creek would be diverted around the active areas of excavation during the construction season. It is assumed that a sheetpile cutoff would be used to divert each stream. The Carmel River would be diverted via a 36-inch pipeline with capacity for about 50 cubic feet per second (cfs). The San Clemente Creek would be diverted via an 18-inch pipeline. The pipelines would discharge to the existing low-level outlet works or existing drawdown ports at San Clemente Dam. Prior to commencing excavation operations, the reservoir water surface would be drawn down by gravity to the invert of the drawdown ports at elevation 514 feet and then further lowered by pumping to the lowest level possible, i.e., approximately elevation 495 feet. Water would be discharged to the river either by pumping into the outlet works or the drawdown ports.

Water originating from local precipitation, springs, and/or seepage through the river diversion structures would seep into the construction area bound on the upstream end by the diversion structures and on the downstream end by the dam. Excavation operations would be managed to promote pre-drainage of the sediments ahead of the excavation. As the level of the sediment is lowered, drainage trenches would be excavated draining to low points, from where water would be removed. Water within the construction area would be turbid due to the earthmoving operations. The reservoir itself would be used as a desilting basin during the construction season. Excess water from within the reservoir would need to be treated to remove turbidity and would be discharged to the river.

Pre-drainage would likely become ineffective in the silt deposits that exist below about elevation 486 feet within 600 to 900 feet of the dam (see Figures 3.5a and 3.5.b in Mussetter, 2003). These materials would need to be mucked out using large hydraulic excavators, draglines, or clamshells working from firm ground. As described above, the excavated material would be placed in a drying/staging area in the immediate vicinity of the point of excavation, from where it would be excavated again and either loaded onto trucks or transported to the conveyor loading facility.

At the end of the construction season, the initial storms that exceed the diversion capacity would fill the reservoir, after which time the diversion pipe would be disconnected and the river flow through the reservoir re-established.

For the second and subsequent construction seasons, before re-starting the sediment excavation operation, the water level in the reservoir would need to be drawn down again. This seasonal initial dewatering activity is assumed to be needed regardless of the sediment disposal site

selected and is therefore not considered a discriminatory factor with regard to the screening of sediment disposal sites.

Hydraulic Excavation

Hydraulic dredging would be accomplished using a portable dredge similar to an Ellicott 1170 Series "Dragon" model (see Ellicott product information at www.dredge.com), discharging to an 18-inch-diameter slurry pipeline. Portability of the dredge is necessary due to the constrained site access conditions, which limit the size of the dredge that can be used. The dredge would be mounted on a barge, with a cutter head and a dredge pump powered by a diesel motor. For this dredge size, total diesel power requirements at the barge are about 1,800 HP. The barge would move around the reservoir by using winches and anchors. A minimum operating draft of 4 feet of water would be needed.

A typical hydraulic dredge operation produces slurry with about 20 percent of solids by weight. In order to achieve reasonable sediment removal rates (discussed in the next section), this solids concentration implies an average water demand for sediment transport of over 20 cfs, which would not be available during the majority of the construction season. Therefore, water recycling is assumed to be required in order to make slurry transport a technically feasible option. Water recycling would involve (1) lining the sediment disposal site with a membrane to minimize water losses, (2) decanting water from the slurry at the disposal site by appropriate design and operation of the disposal cell, (3) installing and operating a water return pump station and pipeline from the sediment disposal site to the reservoir, and (4) possibly using a desilting basin immediately adjacent to the reservoir to reduce the turbidity of the recycled water prior to returning it to the reservoir.

Both the Carmel River and the San Clemente Creek would be diverted around the active areas of excavation during the construction season. It is assumed that a sheetpile cutoff would be used to divert each stream. The Carmel River would be diverted via a 36-inch pipeline with capacity for about 50 cfs. The San Clemente Creek would be diverted via an 18-inch pipeline. The pipelines would discharge to the existing low-level outlet works or existing drawdown ports at San Clemente Dam. Prior to commencing excavation operations, the reservoir water surface would be drawn down by gravity to just below the invert of the spillway at elevation 525 feet. The dredge would then be launched from a staging area near the dam. Dredging would progress from the dam toward upstream. Maximum digging depth would be in the order of 40 feet. Based on the available reservoir profile, it appears that the barge could only travel to about one mile upstream of the dam. The sediment accumulated between the one-mile station and the very tail end of the reservoir (about one-half mile farther upstream) would need to be pushed by earthmoving equipment to the one-mile station to place it within reach of the barge.

The removal of sediment from the reservoir would gradually increase the reservoir volume and tend to gradually lower the reservoir level as the construction season proceeds. The volumes to be dredged each season would need to be carefully planned based in part on the anticipated trend in reservoir water level during the construction season. Water within the construction area, bound on the upstream end by the diversion structures and on the downstream end by the dam,

would be turbid due to the dredging and water recycling operations. The reservoir itself would be used as a desilting basin during the construction season.

At the end of the first construction season, the initial storms that exceed the diversion capacity would fill the reservoir, after which time the diversion pipe would be disconnected and the river flow through the reservoir re-established.

At the beginning of the second season, the reservoir level would again be drawn down to the crest of the overflow spillway. Taking advantage of the initially high reservoir level, the barge would travel as far upstream as possible to dredge the materials from the upper end of the reservoir.

During the last season, the water level in the reservoir would need to be drawn down to about elevation 500 feet to enable removal of sediments at the very bottom of the reservoir, within 2,000 feet of the dam and below elevation 470 feet. Excess water from the reservoir would need to be treated to remove turbidity and would be discharged to the river.

SCHEDULE AND PRODUCTION RATES

Two schedule approaches were considered:

(1) Base Case: For purposes of comparing alternatives in this study, it was assumed that construction work in San Clemente Reservoir would only occur in low-flow months when the Carmel River could be diverted around the active construction area. It was assumed that construction work in the stream would not occur during the winter high flows and steelhead adult migration season.
(2) Accelerated Construction: For the case of hydraulic dredging, a brief evaluation was made of the potential schedule and cost savings involved in continuing with sediment removal operations during winter.

These approaches are described below.

Base Case

For purposes of comparing alternatives, it was assumed that field work in the reservoir area would start on or about April 15. Installation of dewatering facilities would take about one month, with closure of the cofferdams on or about May 15. Fish rescue and drawdown of the reservoir would continue until about May 31. Actual sediment removal operations would take place during a five-month period from June through October. Removal of cofferdams and demobilization of in-stream construction operations would occur in November. Allowing for holidays and a few days of bad weather, it is assumed that there would be 100 working days of actual production operations.

We assumed that earthmoving operations using heavy mobile equipment (trucks, dozers, loaders) could not be conducted at night in the areas near Sleepy Hollow and/or Stone Pine

developments, i.e, that there could not be night work in Sites 1, 2A, or truck traffic originating at Site 1. Accordingly, work hours were assumed to be as follows depending on the disposal site and transport mode used:

- Site 4R (assuming any sediment transportation mode) and Site 6R (assuming either conveyor or pipeline transport): Two 10-hour shifts, five days per week.

- Sites 1/2A (assuming any sediment transportation mode), and Site 6R (assuming truck haul): One 11-hour shift, five days per week.

For computation of actual production, it was assumed that each shift would have one unproductive hour, that is, the 10-hour shifts would have nine hours of actual production and the 11-hour shifts would have 10 hours of actual production.

Excavation and transport rates were assumed to be as follows:

- Slurry and conveyor transport modes: The design of the equipment would provide a peak capacity of 700 cubic yards per hour. An average sustained rate of 500 cubic yards per hour is assumed for purposes of calculating seasonal production.

- Truck transportation: An average production of 500 cubic yards per hour is assumed for truck haul.

The assumed schedule and production rates for a two-shift operation result in an estimated sediment removal rate of about 900,000 cubic yards per season and a three-season sediment removal program for complete dam removal, or a two-season sediment removal program for the dam notching alternative. If only one shift is allowed, the estimated sediment removal rate is only 500,000 cubic yards per season. In this case, five seasons would be required to complete the sediment removal operation for complete dam removal. Three seasons would be required to complete the sediment removal operation for the dam notching alternative using one shift.

These durations do not include the construction time required before and after sediment removal operations. Before beginning construction operations, one season would be needed to mobilize, construct access improvements, install the conveyor or slurry pipeline system, and begin preparation of the sediment disposal site. Likewise, at the conclusion of sediment removal operations, additional time would be needed to remove the dam, reconstruct the river channel, and revegetate the reservoir area.

Accelerated Construction

For the case of hydraulic dredging, a brief evaluation was made of the potential cost and schedule savings involved in continuing with sediment removal operations during winter. This evaluation was only made for disposal Site 4R. The same work hours and production rates described above were assumed for the late spring and summer period of river low-flows. During

the high-flow winter months, the average production was decreased to 400 cubic yards per hour due to greater anticipated difficulty in operating the barge in high river flows. Due to shorter daylight hours, work hours were assumed to be a single shift, 11 hours per day, five days per week. Winter months were assumed to have 18 working days to account for poor weather and non-work days. Based on these assumptions, a continuous sediment removal period of approximately 17 months (June through October) was estimated to be required to complete the sediment removal operation for the dam removal alternative. Thus, it appears that the total construction period could be shortened by one year by continuing to remove sediment through one winter.

The 17-month duration would not include the construction time required before and after sediment removal operations. Before beginning construction operations, one season would be needed to mobilize, construct access improvements, install the slurry pipeline system, and begin preparation of the sediment disposal site. Likewise, at the conclusion of sediment removal operations, additional time would be needed to remove the dam, reconstruct the river channel, and revegetate the reservoir area.

TRANSPORT MODES

Transport by truck and conveyor was evaluated in combination with mechanical excavation. Transport by slurry pipeline was considered in combination with hydraulic dredging. These three transport modes are briefly described below.

Truck Transport

Sites 1 and 2A: Truck transport to Sites 1 and 2A was evaluated and rejected as being impractical. The access roads linking Site 1 to San Clemente Dam are shown on Figure 2. A profile of the round trip from the dam to Site 1 and back to the dam along the loop of existing access roads is shown on Figure 8. The distance is about 6 miles. The roads are typically narrow and cut across very steep terrain, making it impractical to improve them significantly in terms of width and grade. Due to the narrow road width, small trucks would need to be used. A truck cycle to Site 1 is estimated to take between 45 minutes and one hour including loading and unloading. About forty to fifty ten-yard trucks would need to be in operation at any one time to sustain a production rate of 500 cubic yards per hour. Use of this size fleet is not practical given that segments of the road are one-lane-wide but are required to provide service in both directions under controlled traffic restrictions.

Site 4R: Truck transport to Site 4R is considered potentially feasible. A new access road from the reservoir to the site would be constructed along the approximate alignment shown on Figure 4. In addition the Jeep Trail between the site and Cachagua Grade would be improved to provide access to the site and reservoir. Profiles of the access roads and a typical cross-section are shown on Figure 9. The road would consist of a 25-foot-wide graded section with a 3-foot drainage ditch, and surfaced with 6 inches of Class II base rock. The 25-foot road width would provide clearance for two-way traffic of 22-cubic-yard off-road articulated haulers. A truck cycle to Site 4R is estimated to take about fifteen minutes including loading and unloading.

Nine trucks would be needed in operation at any one time to sustain a production rate of 500 cubic yards per hour, with an additional two trucks in maintenance and/or stand-by. Two large front-end loaders working the stockpile at the reservoir would load the trucks.

Site 6R: Truck transport to Site 6R is considered technically feasible but may be impractical due to environmental (primarily traffic- and noise-related) considerations and landowner concerns. A conveyor system (as described below) would be used to transport sediment from the dam to a surge stockpile located at Site 1, where a large front-end loader would load 22-ton highway-legal bottom-dump trucks. A new access road would be constructed from Site 1 to Carmel Valley Road. The new road would start at the stockpile area, cross Tularcitos Creek over a new bridge, and intersect Carmel Valley Road about 800 feet west of San Clemente Drive. The road would consist of a 22-foot-wide graded section with a 3-foot drainage ditch, and surfaced with 6 inches of Class II base rock. After traveling on this road, trucks would enter Carmel Valley Road and travel along it for a distance of about one mile, after which they would exit the highway via a left turn onto the existing Chupines Ranch dirt road. This road would need to be improved to the same dimensions and characteristics described above for a distance of approximately 2.1 miles between Carmel Valley Road and Site 6R. The road alignment is shown on Figure 6. An approximate profile is shown on Figure 10. A truck cycle from Site 1 to Site 6R is estimated to cover the approximate 6.5-mile-long round trip in about thirty minutes including loading and unloading. About twenty-three bottom-dump trucks would be needed in operation at any one time to sustain a production rate of 500 cubic yards per hour, with an additional four or five trucks in maintenance or stand-by.

Conveyor Transport

Sites 1 and 2A: A conceptual design of a 36-inch belt-conveyor system to transport sediment from San Clemente Dam to Site 1 is shown on Drawings D-1, D-4 and D-5 in Appendix D of Entrix (2004). An opening would be cut through the dam and a chute fastened to the downstream face near the right abutment. The chute would discharge to a hopper/feeder installed at the toe of the dam adjacent to the existing 30-inch pipeline. Sediment would be excavated, transported to the dam, and fed to the conveyor via the opening in the dam, chute, and hopper/feeder system. The approximate route of the overland conveyor is shown on Figure 2 and a profile is illustrated on Figure 11. The conveyor would approximately follow the alignment of the existing plunge pool road and San Clemente Drive and would be supported on a steel frame and founded on railroad ties, concrete footings, or concrete piers at about 10-foot spacing. Estimated length of overland conveyor is 13,000 feet from the dam to Site 1. A traveling stacker conveyor would be used to discharge the sediment to a stockpile in Site 1. The steep and winding alignment requires numerous individual conveyor sections, powered by individual motors and connected together. Electric power connections would need to be provided for each conveyor section. Estimated power needs would be 4,200 HP on an operating basis.

A temporary bridge span would need to be constructed to carry the belt conveyor over the Carmel River to Site 2A.

Site 4R: The excavated sediment would be transported to a central stockpile in the reservoir near the mouth of the ravine where Site 4R is located. A gravity-feed reclaim tunnel system would be used to feed the sediment to a 3,500-foot-long, 36-inch overland belt-conveyor system that would transport the sediment to the site. A traveling stacker conveyor would be used to discharge the sediment to a stockpile at the disposal site. A 20-foot-wide access road would be constructed between the reservoir and the disposal site. The belt conveyor would be installed along the road, which would also be used for operation and maintenance. Estimated power needs for the conveyor are 1,850 HP on an operating basis. The approximate routing and profile of the road and conveyor are shown on Figures 4 and 9, respectively.

Site 6R: The conveyor system to transport sediment to Site 6R would be an extension of that described above for Site 1. The approximate conveyor route is shown on Figure 6, and a profile is shown on Figure 12. Instead of ending at Site 1, the conveyor would continue eastward and across Tularcitos Creek along the new access road. It would then run between Carmel Valley Road and Tularcitos Creek for about one mile, would cross the highway via a culvert or overhead structure, and would continue overland to Site 6R through the Chupines Ranch as outlined on Figure 6. Estimated length of overland conveyor is approximately 30,000 feet from the dam to Site 6R. A 20-foot-wide access road would be constructed between Carmel Valley Road and the disposal site. The belt conveyor would be installed along the road, which would also be used for operation and maintenance. A traveling stacker conveyor would be used to discharge the sediment to a stockpile in Site 6R. Estimated power needs would be 11,200 HP on an operating basis.

Hydraulic Transport

For simplicity, hydraulic slurry transport was assumed to be used in combination with hydraulic dredging, although a combination of hydraulic dredging and conveyor or truck transport would also be possible.

The dredge would deliver slurry with about 20% solids by weight and estimated slurry density of about 72 pounds per cubic foot. For excavation rates of 500 to 700 cubic yards of sediment per hour, the slurry flow rates would range from 26 to 37 cubic feet per second (cfs). The slurry needs to flow at a relatively high velocity to avoid settling of the sand and gravel particles. However, the high flow velocities result in high head losses and power demand. For the projected slurry conditions, the minimum, or settling, velocity was estimated to be 15 feet per second. Therefore, an 18-inch inside-diameter pipeline is estimated to be required. The flow velocity through this pipe at the maximum discharge of 700 cubic yards per hour is estimated at 21 feet per second. For cost estimating purposes, a 24-inch outside-diameter HDPE pipe with Dimension Ratio (DR) of 9 was selected. This pipe has a 3-inch wall thickness and can sustain an operating pressure of up to 200 psi. Head losses were estimated to range from 0.04 to over 0.06 feet per foot of pipe. HDPE pipe offers high resistance to abrasion, low friction coefficient, and higher flexibility during construction than other pipe materials. HDPE pipes are assembled with butt-fused joints and can be laid above ground if properly anchored or snaked to allow for expansion and contraction due to temperature changes.

Typical pumping distance form the dredge will be from ½ mile to one mile depending on the material, flow velocity, and gradient. Pumping over longer distances and to higher elevations is accomplished by adding in-line booster pumps to the discharge line. Special pumps that have hard-metal casings and impellers and large flow passages are required due to the large particle sizes and abrasive nature of the slurry. Such pumps are typically used in gravel quarry and tunnel mucking operations. See, for instance, product literature by Weir Minerals on Warman Heavy Duty Dredge & Gravel Pumps at www.weirminerals.com.

Recycled water would be returned from the sediment disposal site to the reservoir via a separate pipeline. For cost estimating purposes an HDPE pipe of the same diameter and wall thickness as the slurry pipe has been assumed. A desilting basin would be constructed at the discharge point of the pipeline to San Clemente Reservoir. The basin would consist of a flat area surrounded by a perimeter formed by dozed sediments. Water discharged to the basin would filter through the perimeter dike and return to the reservoir. Silt deposits in the desilting basin would be dredged periodically.

Site-specific considerations for hydraulic transport are summarized below.

Sites 1 and 2A: The plan and profile of the slurry pipeline are approximately shown on Figures 2 and 11. The slurry pipeline would follow the alignment of the existing pipeline, except that the slurry pipe would need to be routed over the top of the east abutment of the dam and down the rock slope until it reaches the existing steel pipe. Where possible the pipe would be placed on the ground and anchored with piles of rock to prevent excessive snaking due to temperature changes. Where this is not possible the pipe would be anchored to the slope or fastened to the existing concrete supports for the 30-inch steel pipeline. Thrust blocks or anchors would also need to be provided at sharp changes in direction. Estimated pipeline length is 13,000 feet from the dam to Site 1. It is estimated that two booster stations would be required along the route, each with two 18GH Warman Gravel Pumps (or similar) in series. Each booster station would have installed power of 2,000 HP. A 1,200 HP pump station would be required to pump the recycled water back to the dam. Total estimated power needs would be 5,200 HP on an operating basis. For this site it has been assumed that the existing steel pipeline could be used to return recycled water to the reservoir. A recycle pump station and pipeline would be provided from Site 1 to an assumed connection point just south of the filter plant.

A temporary bridge would need to be constructed to carry the two pipelines over the Carmel River to Site 2A.

Site 4R: The approximate routing and profile of pipelines and service road to Site 4R are shown on Figures 4 and 9, respectively. As for the case of conveyor transport, a 20-foot-wide access road would be constructed between the reservoir and the disposal site. The slurry and reclaim water pipelines would be installed along the road, which would also be used for operation and maintenance. It is estimated that two booster stations would be required along the slurry pipeline route to provide a lift of up to 600 feet in elevation differential plus over 100 feet in head loss. Each booster station would be equipped with two 18GH Warman Gravel Pumps (or similar) in series. Each booster station would have installed power of 2,000 HP. A 100 HP pump station

would be required to pump the recycled water back to the dam. Total estimated power needs would thus be 4,100 HP on an operating basis.

Site 6R: The slurry pipeline system to transport sediment to Site 6R would be an extension of that described above for Site 1. The approximate pipeline route is shown on Figure 6, and a profile is shown on Figure 12. Instead of ending at Site 1, the pipeline would continue eastward and across Tularcitos Creek along the new access road. It would then run between Carmel Valley Road and Tularcitos Creek for about one mile, would cross the highway via a culvert or overhead structure, and would continue overland to Site 6R through the Chupines Ranch as outlined on Figure 6. Estimated length of slurry pipeline is 30,000 feet from the dam to Site 6R. A 20-foot-wide access road would be constructed between Carmel Valley Road and the disposal site. The slurry and reclaim water pipelines would be installed along the road, which would also be used for operation and maintenance. It is estimated that seven booster stations would be required along the slurry pipeline route to provide a lift of up to 750 feet in elevation differential plus up to1,900 feet in head loss. Each booster station would be equipped with two 18GH Warman Gravel Pumps (or similar) in series. Each booster station would have installed power of 2,000 HP. A 100 HP pump station would be required to pump the recycled water back to the dam. Total estimated power needs would thus be 14,100 HP on an operating basis.

POWER SUPPLY CONSIDERATIONS

The following information has been developed based on verbal communications with personnel from Pacific Gas & Electric Company (PG&E) and should be considered preliminary. The existing electrical service to San Clemente Dam is supplied by an existing PG&E 60-kilovolt (kV) transmission line originating in Salinas. The 60-kV transmission line enters Carmel Valley from Laureles Grade via Highway 68 and provides power to the Laureles substation in Carmel Valley, located near Carmel Valley Road approximately 2 miles northwest of the San Clemente Drive and Carmel Valley Road intersection. The 60-kV transmission line then continues from the Laureles substation southeast along Carmel Valley Road until it turns south towards San Clemente Dam, following along San Clemente Drive until the Sleepy Hollow fish rearing facility intersection (High Road). From there, the 60-kV transmission line continues due West past Sleepy Hollow, away from the project area. A 12-kV 3-phase pole line branches from the Sleepy Hollow intersection to provide power to San Clemente Dam, terminating outside an onsite structure above the left abutment of the dam. Pole mounted transformers provide 3-phase service to the dam itself (e.g. lights, instrumentation) and a nearby Cal-Am owned residence.

Construction power requirements are governed by the power needs for the conveyor or slurry pumping systems. Smaller additional loads would be imposed by dewatering requirements, construction office trailers, equipment maintenance shop, and night lighting. Based on preliminary discussions with PG&E, the configuration of the existing PG&E 60-kV and 12-kV power lines would not be able to handle the total load demand for any of the conveyor or slurry alternatives. Significant modifications to PG&E's transmission and distribution facilities would be required, as described in Appendix A. Based on conceptual power system evaluations, it is believed that the most efficient way of supplying the needed power would be to use one or more diesel-power generator sets. Therefore, the cost estimates assume that diesel generators would

be used. The generators would run in a primary mode (full-time) and would be equipped with secondary reduction catalytic devices and add-on particulate filters to meet local air quality demands.

DESIGN CONCEPTS FOR SEDIMENT DISPOSAL SITE

The preparation and development of the sediment disposal site and the procedures for sediment placement would be different depending on whether the sediment arrives relatively dry (via truck or conveyor) or in slurry form. These two conditions are discussed separately below.

Sediment Disposal Site Design Concepts for Dry Delivery of Sediment

Site preparation would include the removal of existing facilities and utilities (in the case of Sites 1 and 2A), clearing and grubbing of trees and vegetation from the sediment pile footprint, and stripping and stockpiling of organic soils for use in subsequent restoration and revegetation of the site.

Upon delivery of sediment to the site, the sediment would be spread by means of bulldozers into thin, nearly horizontal lifts. Each lift would be compacted using bulldozers or vibratory compactors. The sediment pile would be constructed with a side slope as required for stability, which has been assumed to average 2-3/4 horizontal to 1 vertical for the purpose of performing site capacity calculations. Debris from dam removal would be placed on selected areas to provide long-term erosion protection. Such areas include the toe of the pile for Sites 1 and 2A, and the groins along the contact between the pile and the hillside abutments at Sites 4R and 6R.

At the conclusion of each construction season, the site would need to be winterized. This would involve (1) providing interim drainage and diversion of ravine flows, (2) stabilizing sloping sediment surfaces and other disturbed areas by installing erosion protection features such as erosion mats or straw mulch and wattles, and (3) providing sediment collection features such as silt fences, straw bales, and sediment traps along the toe of the pile and other disturbed areas.

Once placement of sediment and concrete debris has been completed, the topsoil from the temporary stripping stockpile would be spread over the sediment pile and the area would be revegetated with native plants and trees obtained from the site vicinity. Typical sections for sediment piles at Sites 1, 4R and 6R are shown on Figures 13, 14, and 15, respectively.

Sediment Disposal Site Design Concepts for Slurry Delivery of Sediment

As in the case of dry delivery of sediment, disposal site preparation would include the removal of existing facilities and utilities (in the case of Sites 1 and 2A), clearing and grubbing of trees and vegetation from the sediment pile footprint, and stripping and stockpiling of organic soils for use in subsequent restoration and revegetation of the site. Additional features that would be required for a slurry disposal site are anticipated to be the following:

- Sites 1, 2A and 6R would need to be lined with a liner to minimize slurry water losses. A geomembrane such as PVC or HDPE would be provided to cover the entire footprint of the sediment pile. The liner would need to be protected against puncture by placement of nonwoven geotextiles on both sides of the liner or similar protection. A textured membrane may need to be provided to ensure slope stability. A liner would not be needed for Site 4R because the site is just upstream of San Clemente Reservoir and seepage from this site would return to the reservoir.

- A "starter" containment dike would be constructed to provide initial containment for the slurry. The dike material could be local borrow, or soil from required excavations such as for the access road. A lined toe ditch would be constructed along the downstream toe of the starter dike to allow collection and recycling of the seepage water that passes through the dike.

- A water recycling pump station would need to be installed at the decant pond which would form at the tail end of the disposal site. The pump station would include a portable overflow box to collect the water and a skid-mounted pump connected to the 24-inch-diameter recycled water pipeline. Only a relatively small motor, on the order of 100 HP, would be required to pump the recycled water from Sites 4R and 6R because of their high elevation relative to that of San Clemente Reservoir. A much larger motor, on the order of 1,000 HP, would be needed to pump water to the reservoir from Sites 1 and 2A.

Slurry delivery would begin once the impervious liner, "starter" dike, and recycle pump station and pipeline are in place. The slurry would be pumped to the disposal site and would discharge into the impoundment formed by the "starter" containment dike. The solids would deposit near the pipe outlet and would form a beach that slopes downward away from the pipe. The coarsest materials (coarse sand and gravel) would deposit closest to the pipe, the finer sand would deposit farther, and the silt would be carried farther by the water and deposit in the "decant" pond on the opposite end of the impoundment, where the recycle pump station would be located. Depending on the detention time provided by the decant pond, some of the finer silt particles may remain suspended in the recycle water and be pumped back to the reservoir. A bulldozer or rubber-tired tractor would be used to continuously travel over the rising beach to manage the discharge piping and the sediment deposition and to compact the deposited sediment to a specified level of compaction. In addition, on a periodic basis (such as weekly), a dozer would be used to construct a containment dike raise, extend and raise the discharge pipe, and lift and relocate the overflow box, recycle pump and water return pipeline.

At the conclusion of each construction season, the site would need to be winterized. This would involve (1) providing interim drainage and diversion of ravine flows, (2) stabilizing sloping sediment surfaces and other disturbed areas by installing erosion protection features such as erosion mats or straw mulch and wattles, and (3) providing sediment collection features such as silt fences, straw bales, and sediment traps along the toe of the pile and other disturbed areas.

At the conclusion of the sediment disposal operation, debris from dam removal would be placed in selected areas to provide long-term erosion protection. Such areas may include the toe of the pile for Sites 1 and 2A, and the groins along the contact between the pile and the hillside

abutments at Sites 4R and 6R. Once placement of sediment and concrete debris has been completed, the topsoil from the temporary stockpile would be spread over the sediment pile, and the area would be revegetated with native plants and trees obtained from the site vicinity. Typical sections for sediment piles at Sites 1 and 2A, 4R and 6R are shown on Figures 13, 14, and 15, respectively.

LAND OWNERSHIP CONSIDERATIONS

The property where Site 1 is located is owned by California American Water Company. Cal-Am has expressed tentative willingness to allow use of the site as a sediment disposal site.

The property where Site 2A is located is owned by California American Water Company, but it is leased to the operators of the Stone Pine horse stables. The terms and conditions of the lease are not known. The western and northern edges of Site 2A may encroach on property owned by G. and N. Hentschel.

The property where Site 4R is located is owned by the Monterey Peninsula Regional Park District, which in the past has expressed tentative support for sediment disposal at Garland Ranch, another District-owned property (Moffatt & Nichol, 1996). There has been no contact with the District regarding the potential use of Site 4R as sediment disposal site.

The property where Site 6R is located is owned by W. Wilson et al., which in the past have expressed tentative support for sediment disposal at this site (Pers. Comm., 2005).

COMPARATIVE OPINIONS OF PROBABLE CONSTRUCTION COST FOR SEDIMENT DISPOSAL

Conceptual-level, comparative opinions of probable construction cost were developed for the various sediment disposal sites alternatives described above using HCSS Heavy Civil estimating software. The conceptual estimated costs for the dam removal alternative (2.5 million cubic yards of sediment) are summarized in Table 1, and the conceptual estimated costs for the dam notching alternative (1.5 million cubic yards of sediment) are summarized in Table 2. The opinions of probable cost presented in Tables 1 and 2 include a contingency of 25 percent to account for pricing variations, to incorporate additional potential construction costs related to design development, and to cover approximations in estimating. Also included are allowances for "non-construction" project costs, including land use easements, permitting, environmental compliance and mitigation, design engineering, Owner's administrative costs, and construction engineering and administration.

The opinions of probable construction cost are based on the sediment removal and disposal concepts described in this memorandum, the volume of sediment to be removed estimated by Mussetter (MEI, 2003 and 2005), the cost estimate prepared by Entrix for environmental permitting and steelhead and CRLF mitigation activities (Entrix, 2004), and MWH's evaluation

of the major construction items appropriate to complete the work. In addition, the estimated costs are based on the following:

- Labor rates and fringes are from January 2005 Davis-Bacon rates for Monterey County. Labor costs are based on 5 days per week, 10 hours per shift. Payroll tax and workers compensation insurance are set at 38%.

- Equipment rates are drawn from estimator's equipment history information.

- Material costs are based on typical costs for similar work. Construction water is assumed available on site.

- The crews developed for use in these estimates are derived from experience for similar work.

- An assumed royalty has been included to address land use/land easement costs at an assumed rate of $0.25 per ton for use of Sites 2A, 4R, and 6R, including any required access corridors. Use of Site 1 and the access roads between Site 1 and the dam has been assumed to be free of land use/land easement costs.

- Order-of-magnitude cost allowances have been included to address the cost of certain items associated with the dam removal project that are the same regardless of which disposal site and excavation method is selected. Specifically, these items include (1) the removal of the dam structure, (2) the restoration of the reaches of Carmel River and San Clemente Creek now occupied by reservoir sediments, and (3) the construction of an alternative water diversion facility to replace San Clemente Dam in Cal-Am's system. These order-of-magnitude cost allowances will be refined once the sediment disposal site is selected and the cost estimates for the dam removal and dam notching alternatives are refined.

- Direct construction costs are based on 1st-quarter 2005 dollars. Escalation to the mid point of the construction period has been included for each alternative at an assumed average construction inflation rate of 5%.

- Project financing costs are excluded.

- No costs have been added for damage or lost time due to the potential for overtopping of the stream diversion system and work site.

- The cost for those permitting and mitigation measures associated with steelhead and CRLF that were described by Entrix (2004) are included. Additional measures that may be required by regulatory agencies are not included.

- If further restrictions on the construction schedule are imposed based on environmental issues not described above, the construction schedule may need to be extended. This

would result in additional mobilization, dewatering and winterization costs that are not included in the current estimate.

- Weather conditions could also impact the construction schedule. If the construction program occurs during a wet cycle and spring flows remain high for an extended period at the beginning of the construction season, or if significant storms occur in early fall, construction delays could occur that would increase the number of construction seasons. This would result in additional mobilization, dewatering and winterization costs that are not included in the current estimate.

- Disposal costs associated with removal of the conveyor equipment and slurry pipelines are assumed to equal the salvage value. Estimated costs have not been reduced in anticipation of cost recovery of used conveyance equipment.

- Average unit weight of the sand/gravel sediments is assumed to be 105 pounds per cubic foot. In-situ moisture content at the time of transport is assumed to be on the order of 20%.

It should be emphasized that the opinions of probable construction cost have been prepared at a conceptual level for the primary purpose of comparing alternatives. The cost of the selected alternative will change up or down as the design is defined in more detail and as it evolves in response to the evolving needs of the project's stakeholders. Furthermore, the estimate of costs shown and any resulting conclusions on the project financial, economic feasibility, or funding requirements, have been prepared from guidance in the project evaluation and implementation from the information available at the time the estimate was prepared. The final costs of the project and resulting feasibility will depend on actual labor and material costs, competitive market conditions, and other variable factors. Accordingly, the final project costs may vary from the estimate. Project feasibility, benefit/cost analysis, risk and funding must be carefully reviewed prior to making specific funding decisions and establishment of the project budget.

For the alternative involving hydraulic dredging with slurry transport and disposal at Site 4R, a brief evaluation was made of the potential schedule and cost savings involved in continuing with sediment removal operations during winter. For this option, sediment removal would continue uninterruptedly over two summers and one winter instead of three summer seasons separated by two demobilizations. Potential savings of $1 to $1.5 million were estimated in mobilization, dewatering, and contractor indirect costs. When the corresponding reductions in contingency, construction management, administration, and escalation are factored in, the total savings could amount to $3 to $4 million. However, the effect of this approach on the cost of environmental permitting and steelhead mitigation is unknown and could significantly offset these potential savings.

ASSESSMENT OF SEDIMENT DISPOSAL ALTERNATIVES

Advantages and disadvantages of the sediment disposal alternatives described above are summarized in Table 3. It should be noted that environmental reviews of the sediment disposal

sites have not been performed, and mitigation measures for potential environmental impacts at these sites have not been developed nor included in the comparative cost estimates. These activities are not part of the scope of this screening study, but will be conducted by Entrix as part of the EIR/EIS preparation.

All sediment disposal sites evaluated in this study are considered to be technically feasible. However, the complexity and cost of sediment disposal operations are directly, and strongly, proportional to the distance between San Clemente Reservoir and the sediment disposal site. The assessment of the sites below herein applies equally to the dam removal and dam notching alternatives.

Site 4R: Site 4R is closest to the reservoir and is by far the most advantageous site of those considered, environmental considerations notwithstanding. While the site is significantly higher in elevation than the reservoir, transport costs and energy consumption associated with sediment disposal operations would still be lowest for this site. Required power supply upgrades appear to be manageable. The site is more remote and therefore the interface between construction operations and the public would be reduced. Sediment removal could proceed in two shifts, thus resulting in a shorter schedule than at Sites 1 and 2A. Site 4R has ample capacity to store all sediment. Access would be from Cachagua Grade; improvements to San Clemente Drive would not be required. The one significant disadvantage of Site 4R is that it is not owned by Cal-Am and, therefore, use of the site and access easements would need to be negotiated with the Monterey Peninsula Regional Park District, the current owner of the land where the site is located.

Both sediment excavation alternatives (mechanical and hydraulic dredging) and all three transport alternatives (truck, conveyor, slurry) are considered feasible for Site 4R. Transport by either conveyor or slurry pipeline appears to have a cost advantage over trucking. Transport by conveyor appears to be the simplest alternative and would entail less power usage and lower emissions than either slurry or trucking.

Sites 1 and 2A: Sites 1 and 2A in combination have a capacity that is barely sufficient for the total volume required for dam removal. Site 1 alone does not have enough capacity to store the sediment volume required for either the dam removal alternative or the dam notching alternative.

While the sites are slightly lower in elevation than the reservoir, the required power supply, transport costs and energy consumption associated with sediment disposal operations would be greater for these sites than for Site 4R due to the significantly greater distance between the reservoir and the disposal sites. Proximity of these sites to the Sleepy Hollow and Stone Pine developments would constrain construction operations due to traffic, noise, and emissions impacts. It is dubious that two shifts would be possible. Thus, the sediment removal schedule would likely be lengthened, potentially by as much as two years for the dam removal alternative. Access to the reservoir would be via a new access road over Tularcitos Creek and San Clemente Drive. Improvements to San Clemente Drive between the Carmel Valley Filter Plant and the dam would be required. Site 1 is owned by Cal-Am and could readily be placed into use. Although also owned by Cal-Am, Site 2A has been leased to a third party and has been developed for use as a horse track, horse stables, barn and related facilities.

Both sediment excavation methods (mechanical and hydraulic dredging) and two transport modes (slurry, conveyor) are considered feasible for Sites 1 and 2A. Transport by truck is not considered feasible due to the tortuous route, narrow roads and steep terrain. Slurry transport appears to have a slight cost advantage over conveyor but would involve additional features at the disposal site to recycle the water decanted from the slurry, which would be returned to the reservoir via a separate pump station and pipeline. Transport by conveyor would also be feasible. A temporary bridge would be needed over Carmel River between Sites 1 and 2A to deliver sediment to Site 2A whether a conveyor or slurry pipeline is used.

Site 6R: Site 6R is an undeveloped ravine in the Chupines Ranch property owned by the Wilson family. Although Site 6R has ample capacity, it appears to be the least desirable of those considered. Because of the large distance from the reservoir to the site and the site's significantly higher elevation than the reservoir, the transport costs, power supply upgrades, and energy consumption associated with sediment disposal operations would be by far the greatest for this site. The power demand needed to operate either conveyors or a slurry pipeline would require the replacement of a PG&E transmission line from Carmel Valley to Salinas or the installation of approximately seven large mobile diesel-operated generator sets, at a significant cost.

Both sediment excavation alternatives (mechanical and hydraulic dredging) and three transport alternatives (conveyor, slurry, and conveyor to Site 1 followed by truck transport from Site 1 to Site 6R) are considered potentially feasible for Site 6R. Transport by truck between San Clemente Dam and Site 1 is not considered feasible due to the tortuous route, narrow roads and steep terrain. Transport by conveyor to Site 1 followed by truck transport from Site 1 to Site 6R appears to have a slight cost advantage over the slurry and conveyor transport options. Slurry transport also would be feasible but would involve additional features at the disposal site to recycle the water decanted from the slurry, which would be returned to the reservoir via a separate pump station and pipeline. The conveyor or slurry pipeline route would run from San Clemente Dam to Site 1. From there, the conveyor or slurry pipeline would run between Carmel Valley Road and Tularcitos Creek, cross Carmel Valley Road in a culvert, and follow a new service road corridor across the Chupines Ranch property to Site 6R. Truck access would be via Carmel Valley Road and an existing dirt road, which would need to be widened to permit two-way haulage. Access to San Clemente Reservoir would be via a new access road over Tularcitos Creek and San Clemente Drive. Improvements to San Clemente Drive between the Carmel Valley Filter Plant and the dam would be required.

A two-shift operation was assumed for the conveyor and slurry pipeline transport alternatives. However, it is dubious that two shifts would be possible if the material is deposited via conveyor at Site 1 and loaded to trucks. The proximity of Site 1 to the Sleepy Hollow and Stone Pine developments would constrain construction operations due to traffic, noise, and emissions impacts. Thus, the sediment removal schedule would likely be lengthened, potentially by as much as two years for the dam removal alternative. Additionally, heavy truck traffic would occur on the segment of Carmel Valley Road between the proposed access road to the filter plant and the Chupines Ranch driveway.

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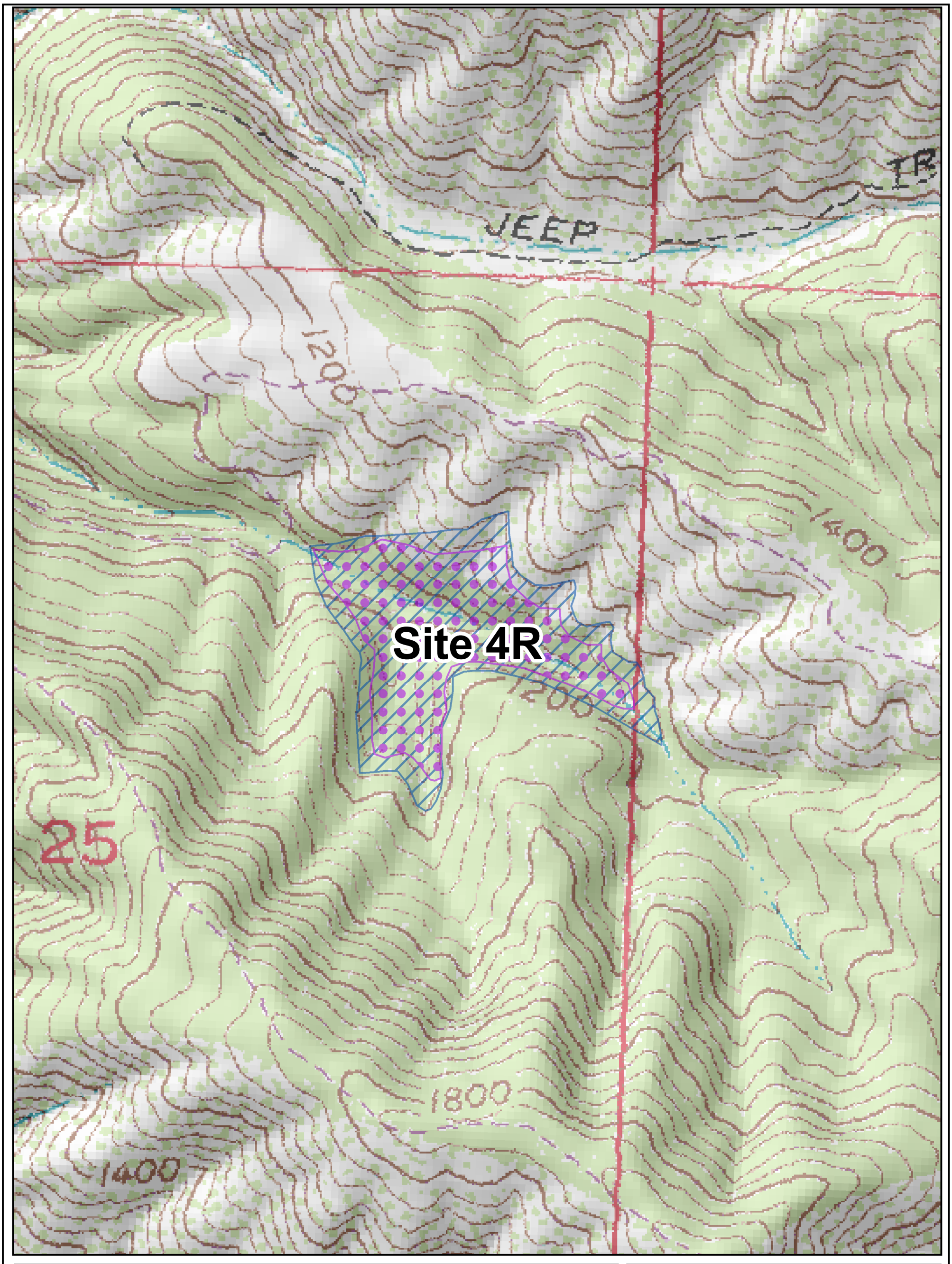
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Appendix A – Conceptual Evaluation of Electric Power Supply via PG&E Grid for Sediment Transport Alternatives



Legend

Sediment Disposal Site

Alternative 1

Alternative 2

Projection: California State Plane, Zone IV
Datum: NAD 83 Units: Feet

San Clemente Dam EIS/EIR

Appendix G

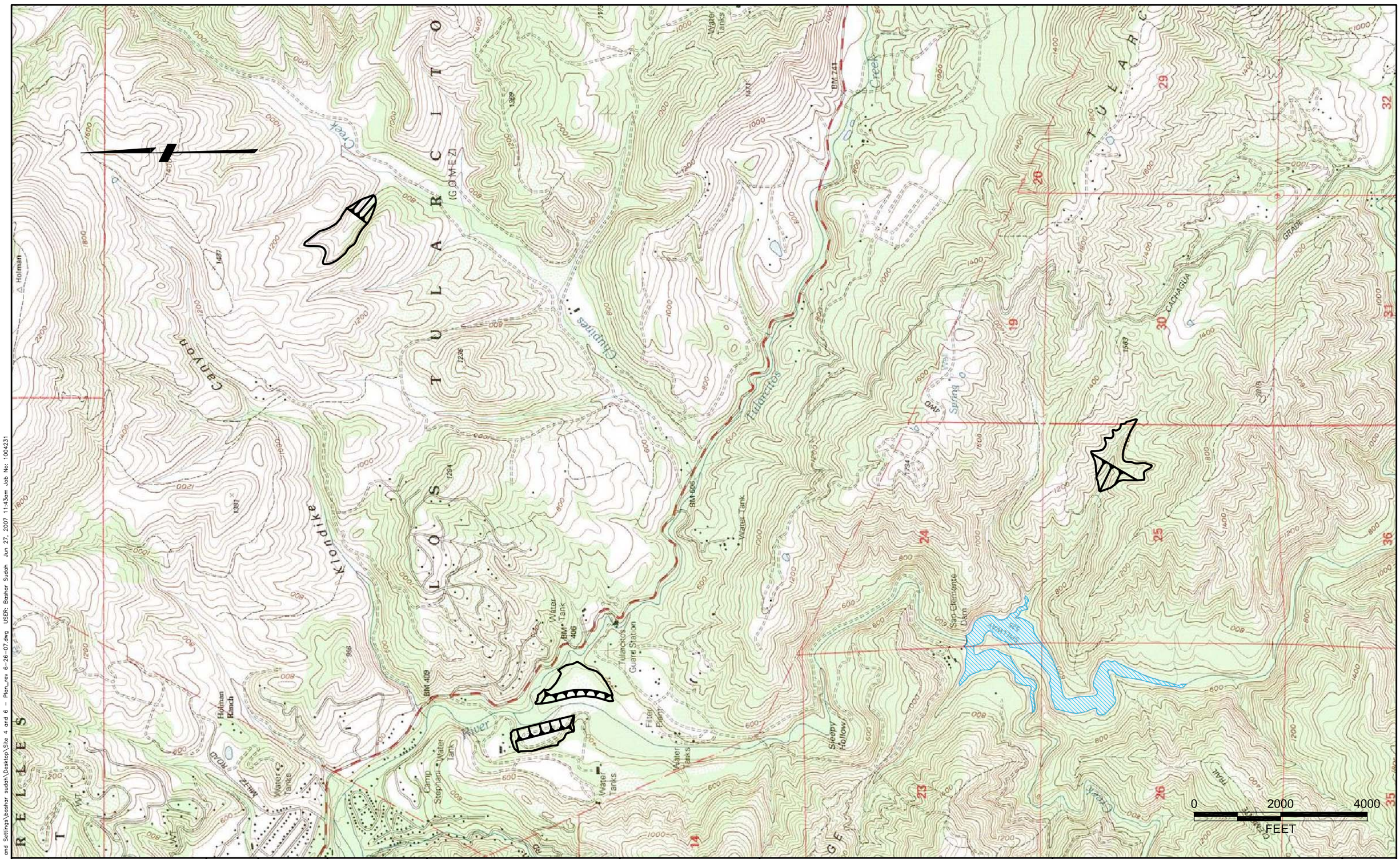
Local Vicinity Map

N

0 100 200 400

Meters

C:\GIS\entrix\3018605\map\SC_SedimentDisposalSiteAlternative_17i11i.mxd 6/27/2007 2:17:12 PM Mukhtyar



REV	DATE	BY	DESCRIPTION

SCALE

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED
DRAWN
CHECKED

MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
SEDIMENT DISPOSAL SITES LOCATION MAP

FIGURE 1

XREF: BDR
FILE: C:\Documents and Settings\bashar sudoh\Desktop\Site 4 and 6 - Plan_rev 6-26-07.dwg USER: Bashar Sudoh Jun 27, 2007 11:43am Job No: 1004231

LEGEND:

TRUCK ROUTE
SLURRY PIPELINE ROUTE
CONVEYOR ROUTE

OLD CARMEL RIVER DAM BRIDGE CROSSING

LOW ROAD (ONE WAY TRUCK ROAD FROM DAM)

PLUNGE POOL ACCESS ROAD

CONVEYOR ROUTE

TRAFFIC CONTROL AND CONVEYOR ROUTE

SITE 1

ONE WAY TRUCK ROUTE TO FILTER PLANT

TWO-WAY TRUCK ROUTE FROM FILTER PLANT TO CARMEL VALLEY ROAD

SITE 2A

ONE-WAY TRUCK ROAD TO DAM, SLURRY PIPELINE, AND CONVEYOR ROUTE

SLURRY PIPELINE ROUTE

0 1000 2000
FEET

REV	DATE	BY	DESCRIPTION

SCALE

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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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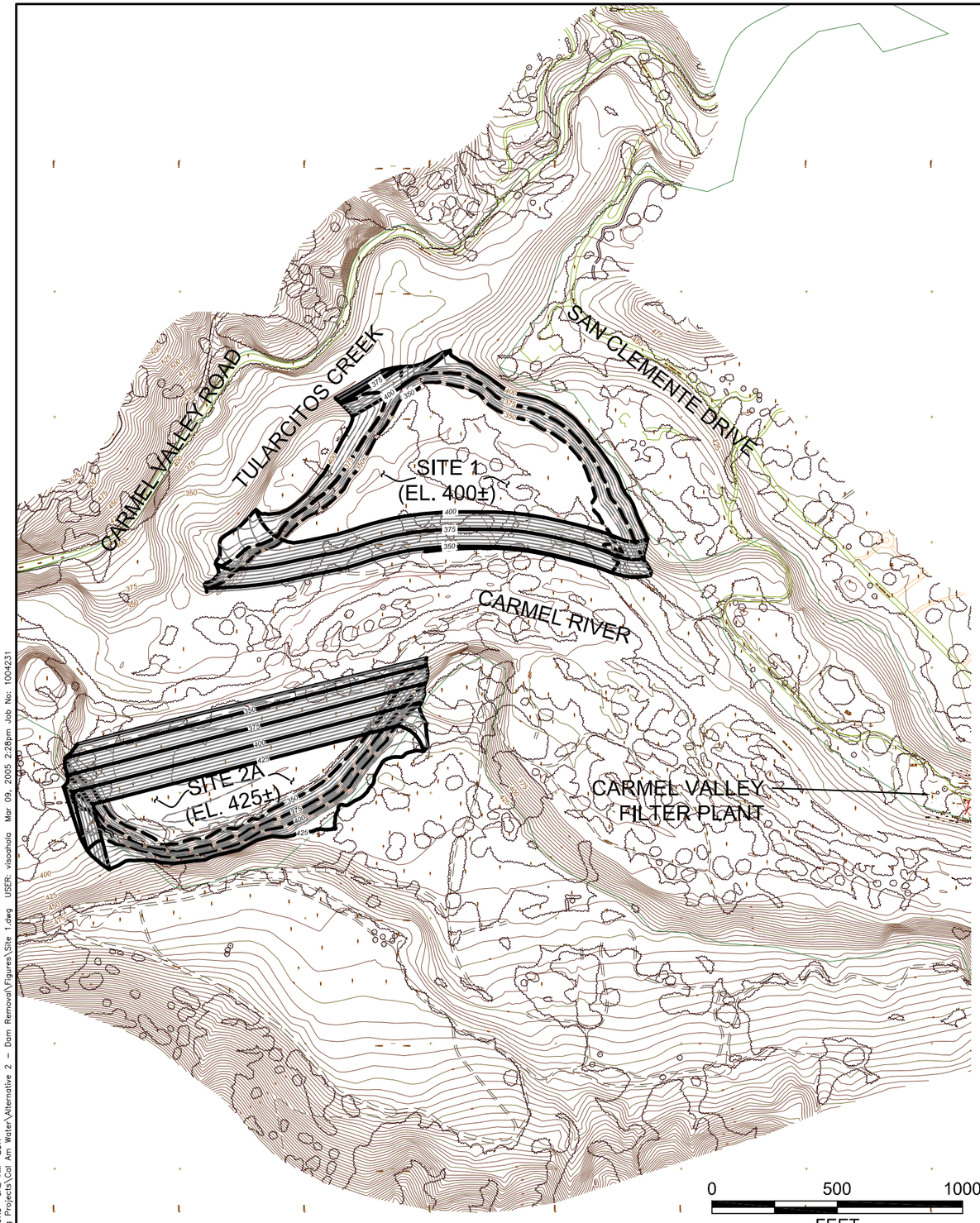
MWH
Walnut Creek
California

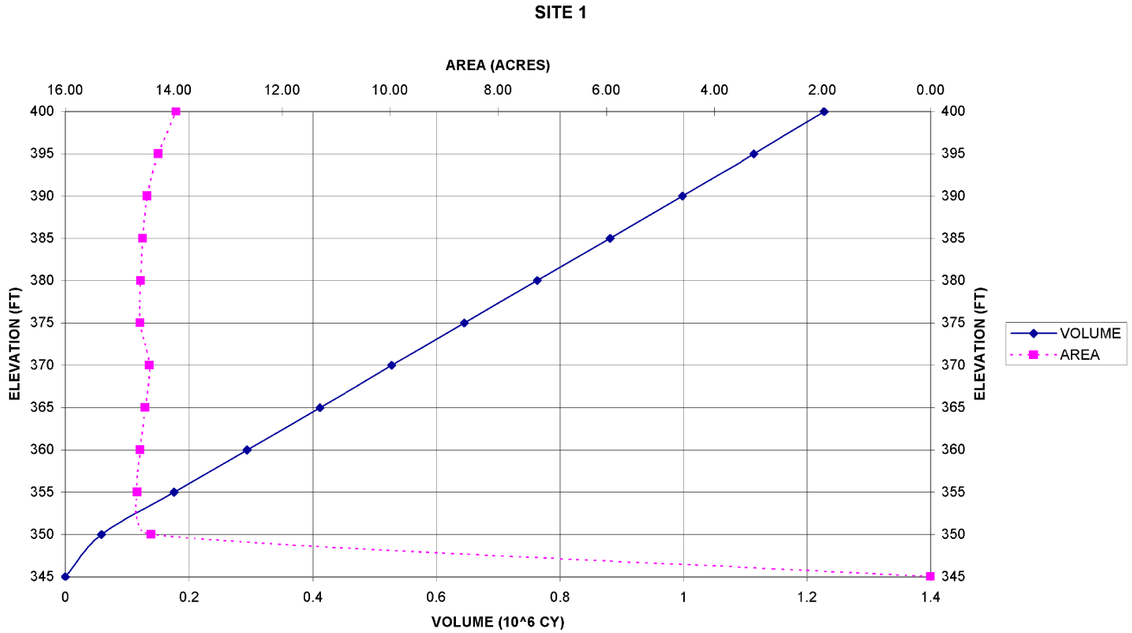
CALIFORNIA AMERICAN WATER

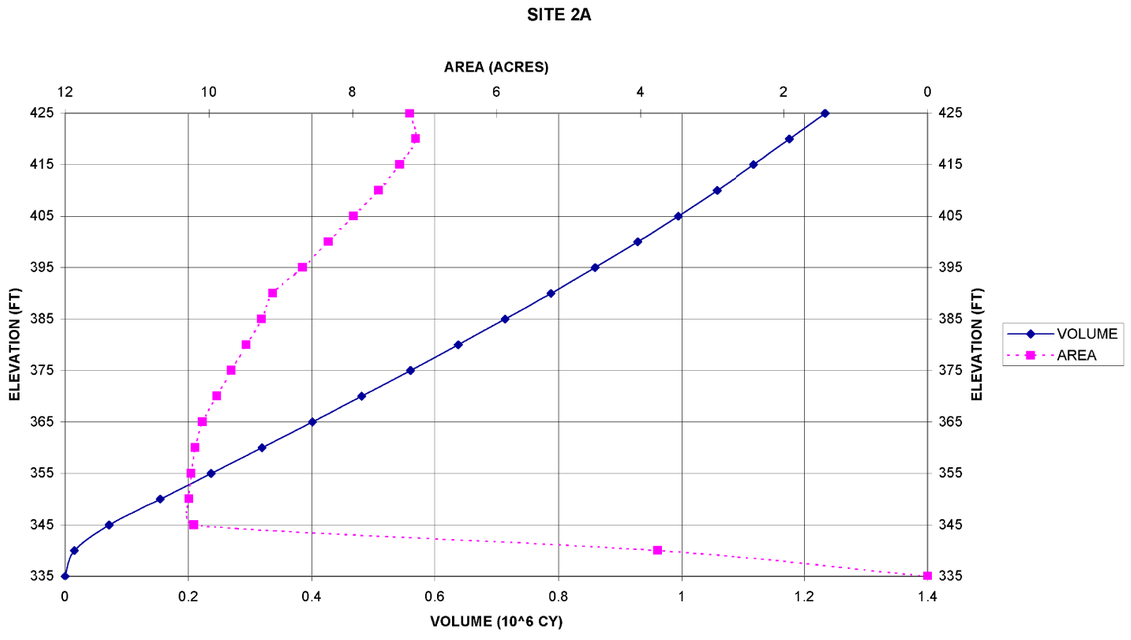
SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
PLAN OF SEDIMENT DISPOSAL SITES 1 AND 2A

FIGURE 2

XREF: X-TOPO CONTOURS CAL-AM BDR
FILE: F:\Shared\Working Projects\Cal Am Water\Alternative 2 – Dam Removal\Figures\Site 1.dwg USER: vlaoahola Mar 10, 2005 11:53am Job No: 1004231







XREF: X-TOPO CONTOURS CAL-AM BDR
FILE: F:\Shared\Working Projects\Cal Am Water\Alternative 2 – Dam Removal\Figures\Site 1.dwg USER: vkoohola Mar 09, 2005 2:28pm Job No: 1004231

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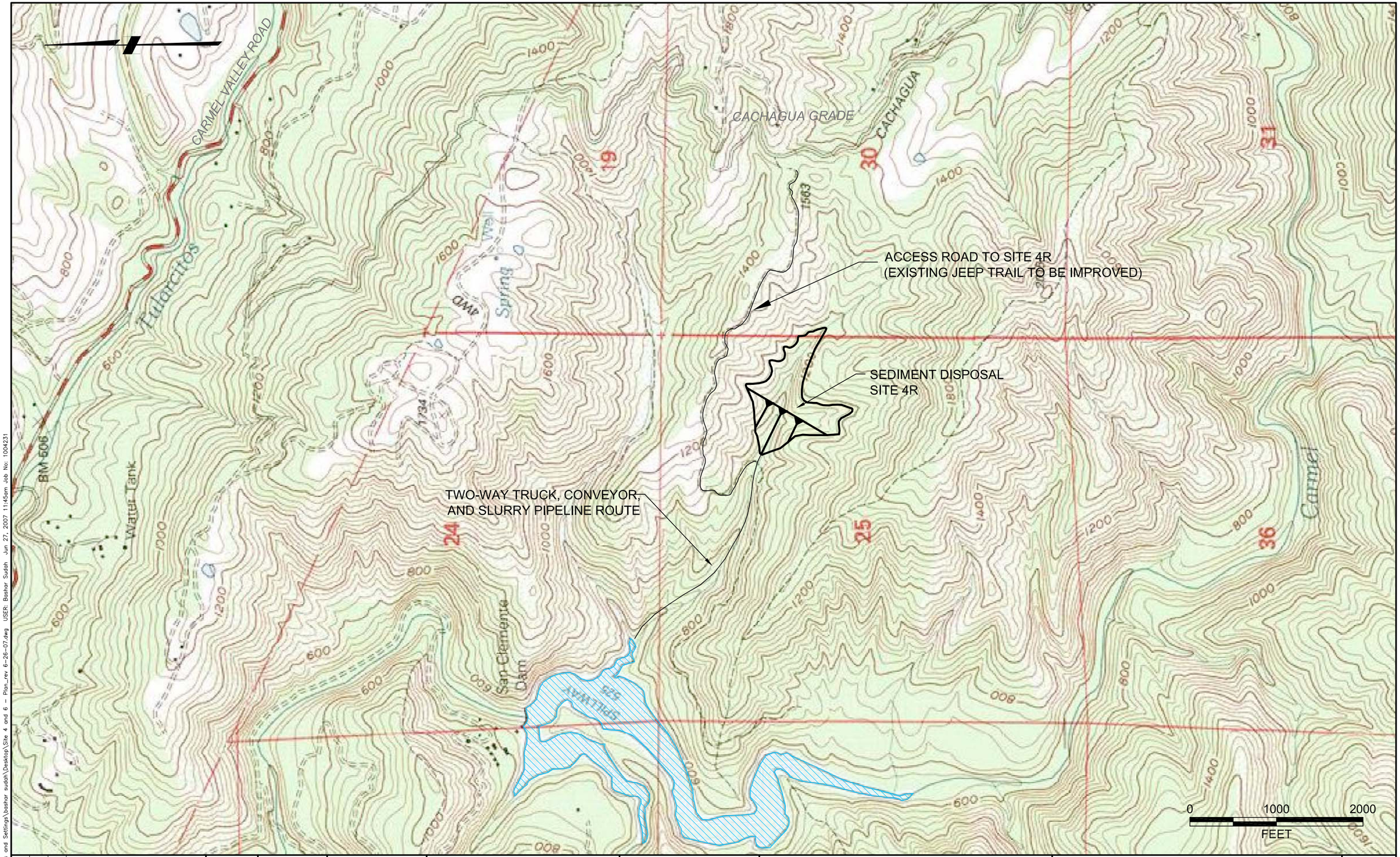
DESIGNED
DRAWN
CHECKED

MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
AREA–CAPACITY CURVES OF DISPOSAL SITES 1 & 2A

FIGURE 3



REV	DATE	BY	DESCRIPTION

SCALE

WARNING
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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED
DRAWN
CHECKED

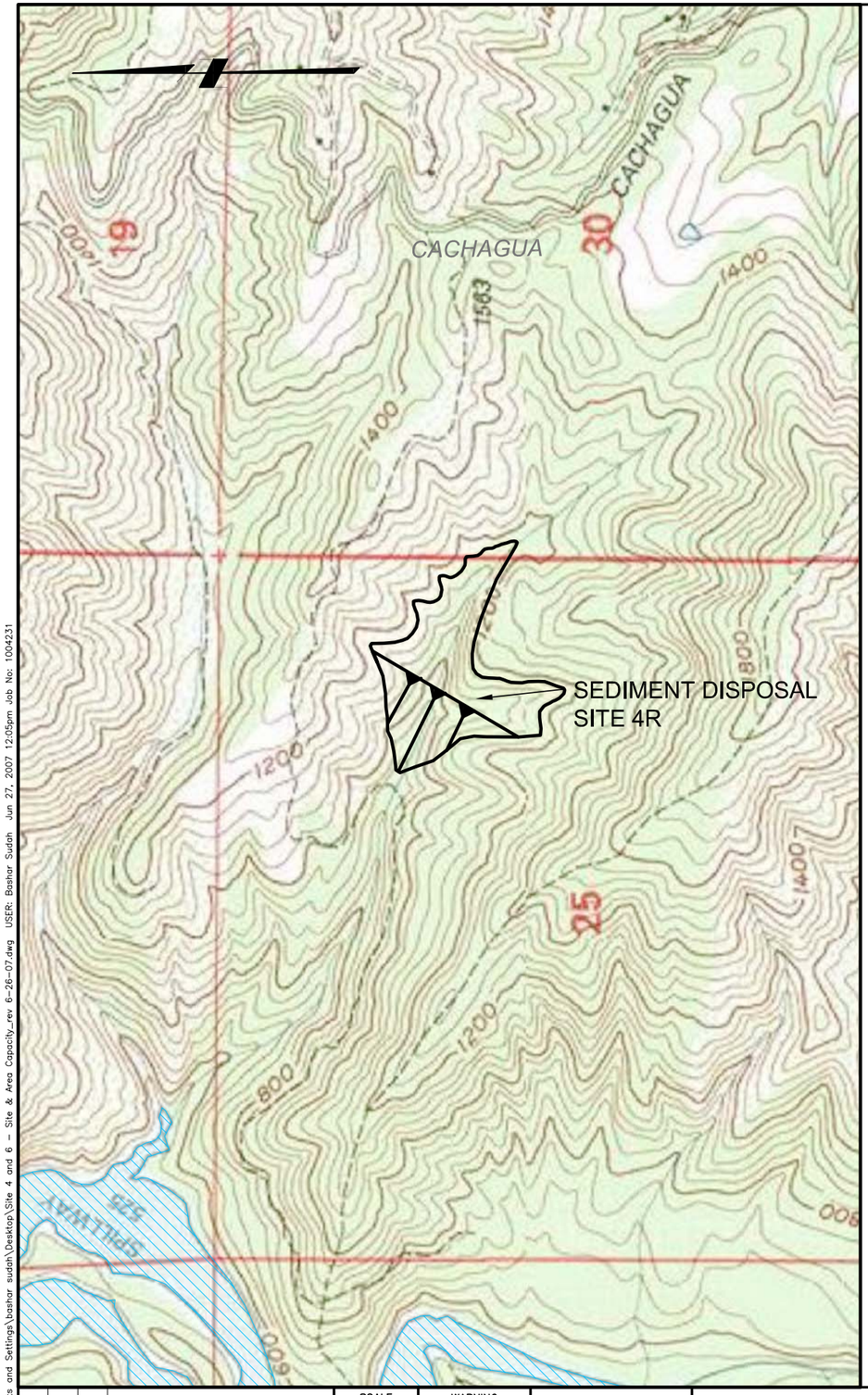
MWH
Walnut Creek
California

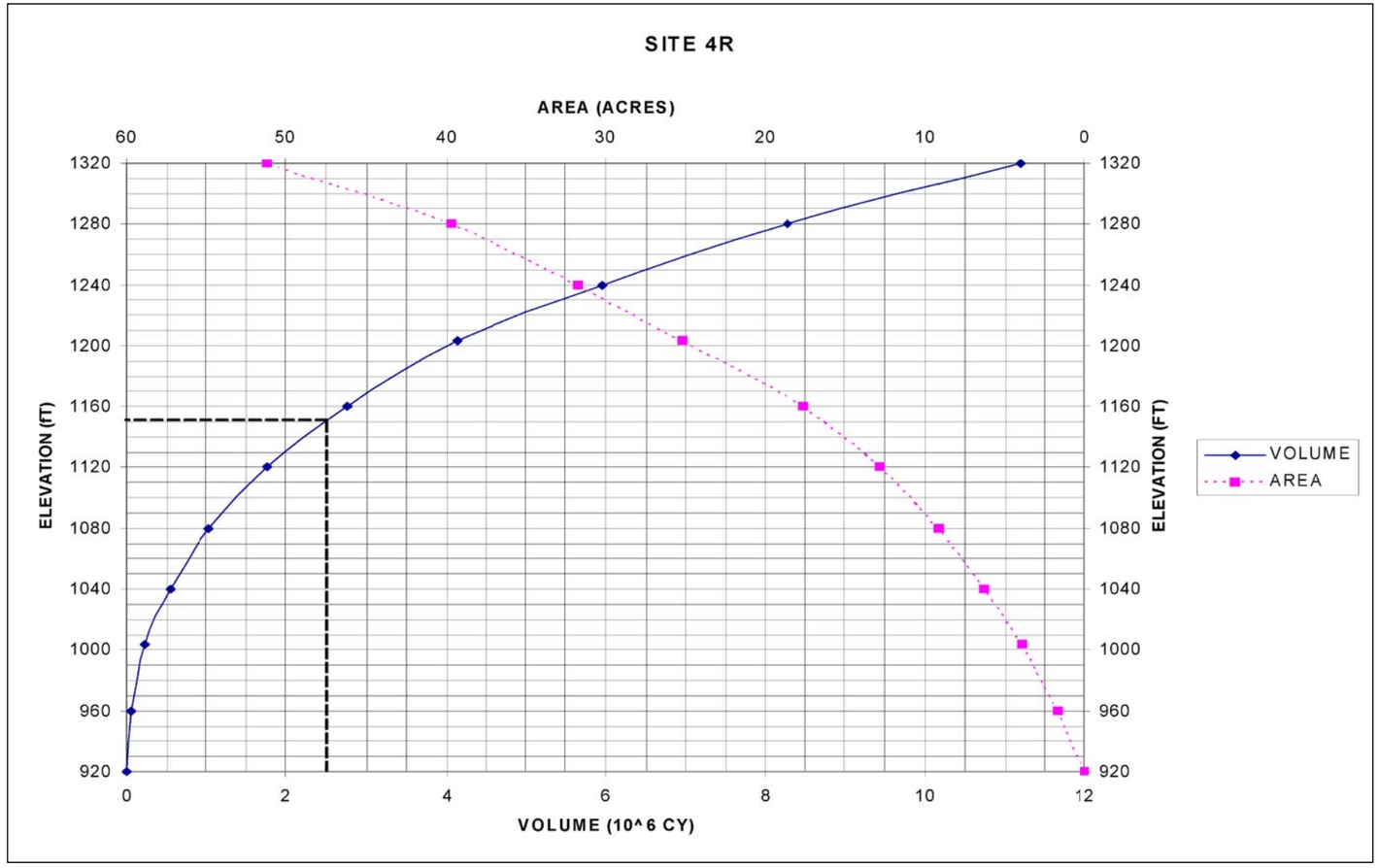
CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
PLAN OF SEDIMENT DISPOSAL SITE 4R

FIGURE 4

XREF: BDR
FILE: C:\Documents and Settings\bashar sudah\Desktop\Site 4 and 6 - Plan_rev 6-26-07.dwg USER: Bashar Sudah Jun 27, 2007 11:45am Job No: 1004231





0 1000 2000
FEET

XREF: BDR
FILE: C:\Documents and Settings\bashar sudah\Desktop\Site 4 and 6 – Site & Area Capacity_rev 6-26-07.dwg USER: Bashar Sudah Jun 27, 2007 12:05pm Job No: 1004231

REV	DATE	BY	DESCRIPTION

SCALE

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED
DRAWN
CHECKED

MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER
SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
AREA–CAPACITY CURVES OF SEDIMENT DISPOSAL SITE 4R

FIGURE 5

LEGEND:

TRUCK ROUTE
SLURRY PIPELINE ROUTE
CONVEYOR ROUTE

SEDIMENT DISPOSAL SITE 6R

TWO-WAY TRUCK ROAD

CONVEYOR ROUTE

SLURRY PIPELINE ROUTE

OLD CARMEL RIVER DAM BRIDGE CROSSING

LOW ROAD (ONE WAY TRUCK ROAD FROM DAM)

PLUNGE POOL ACCESS ROAD

TRAFFIC CONTROL SECTION

ONE WAY TRUCK ROUTE TO FILTER PLANT

TWO-WAY TRUCK ROAD FROM FILTER PLANT TO SITE 6R

ONE-WAY TRUCK ROAD TO DAM

HIGH ROAD (ONE WAY TRUCK ROAD TO DAM)

0 2000 4000
FEET

REV	DATE	BY	DESCRIPTION

SCALE

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED
DRAWN
CHECKED

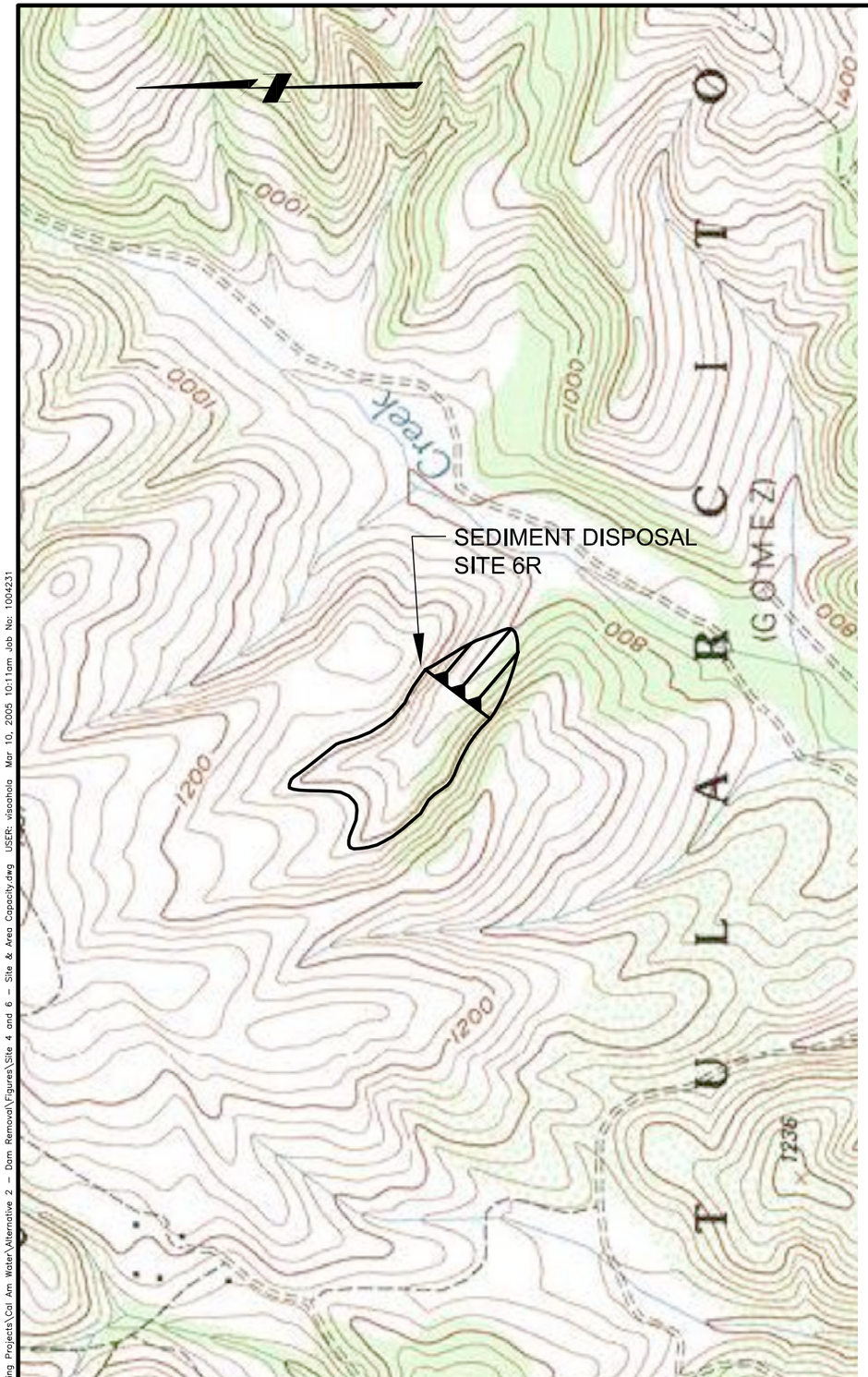
MWH
Walnut Creek
California

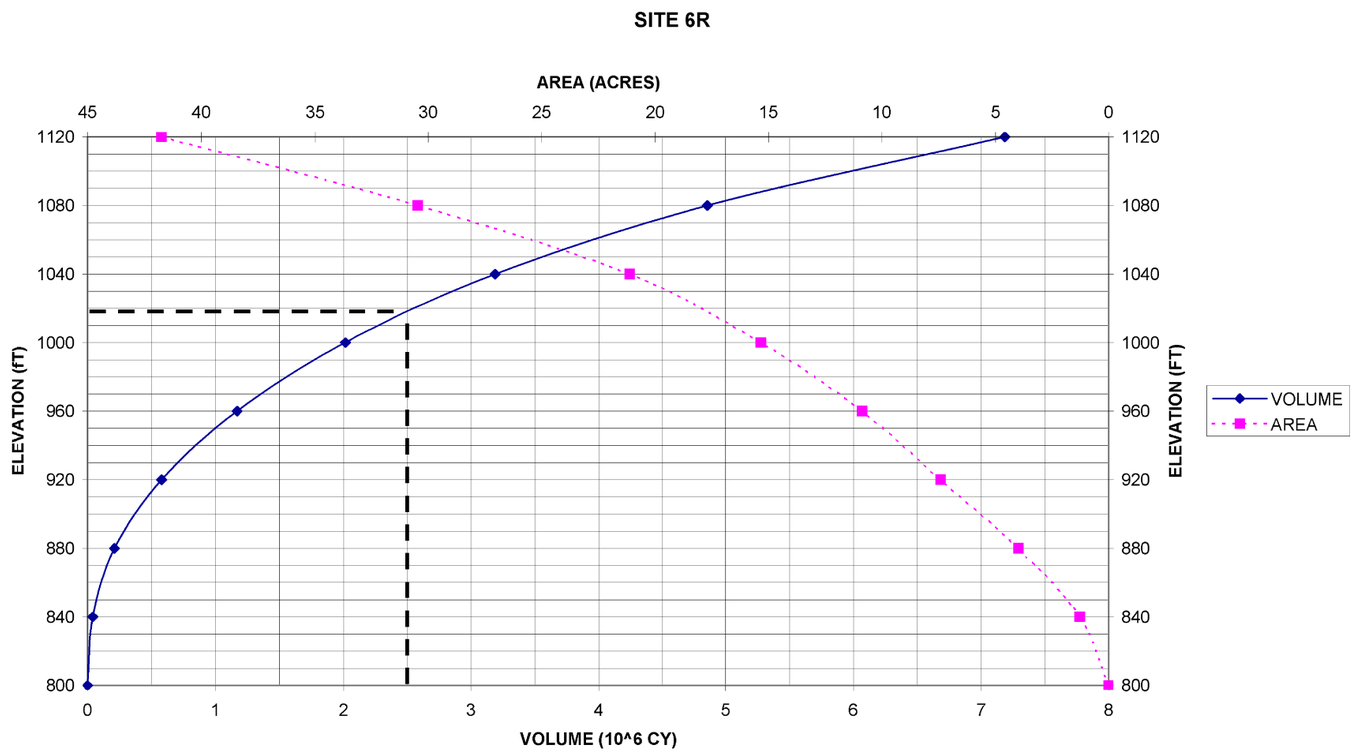
CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
PLAN OF SEDIMENT DISPOSAL SITE 6R

FIGURE 6

XREF: BDR
FILE: F:\Shared\Working Projects\Cal Am Water\Alternative 2 – Dam Removal\Figures\Site 4 and 6 – Plan.dwg USER: wsaohola Mar 10, 2005 11:55am Job No: 1004231





0 1000 2000
FEET

REV	DATE	BY	DESCRIPTION

SCALE

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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED
DRAWN
CHECKED

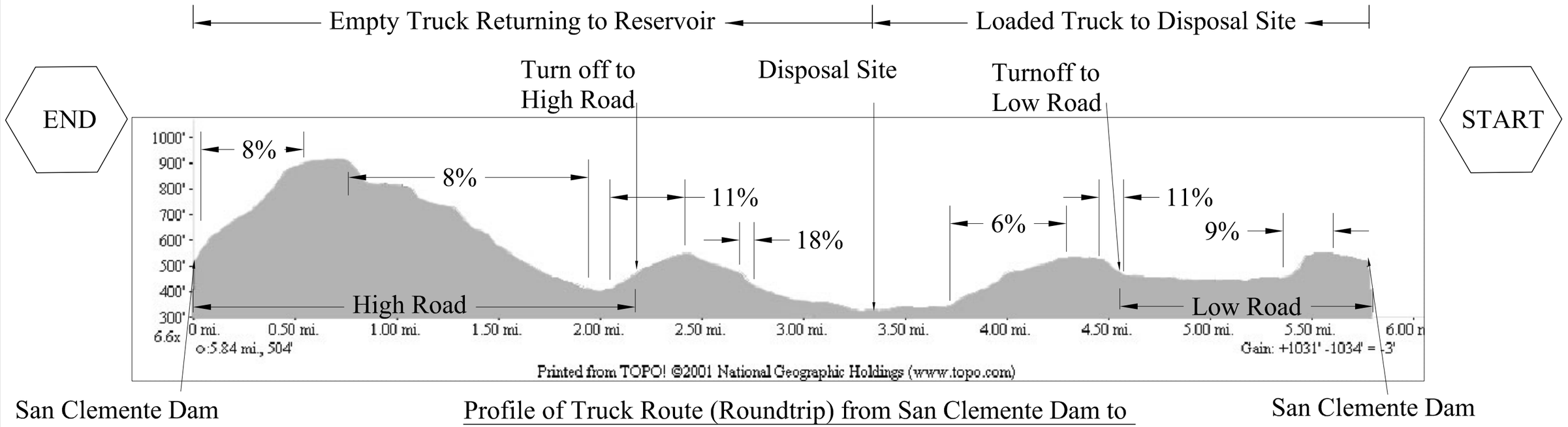
MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
AREA–CAPACITY CURVES OF SEDIMENT DISPOSAL SITE 6R

FIGURE 7

XREF: BDR
FILE: F:\Shared\Working Projects\Cal Am Water\Alternative 2 – Dam Removal\Figures\Site 4 and 6 – Site & Area Capacity.dwg USER: visoaholo Mar 10, 2005 10:11am Job No: 1004231



Profile of Truck Route (Roundtrip) from San Clemente Dam to Sediment Disposal Site 1 and Back to San Clemente Dam

XREF: BDR
FILE: F:\Shared\Working Projects\Cal Am Water\Alternative 3 – Dam Notching\Figures\Site Profiles.dwg USER: visaohalo Mar 10, 2005 10:44am Job No: 1004231

REV	DATE	BY	DESCRIPTION

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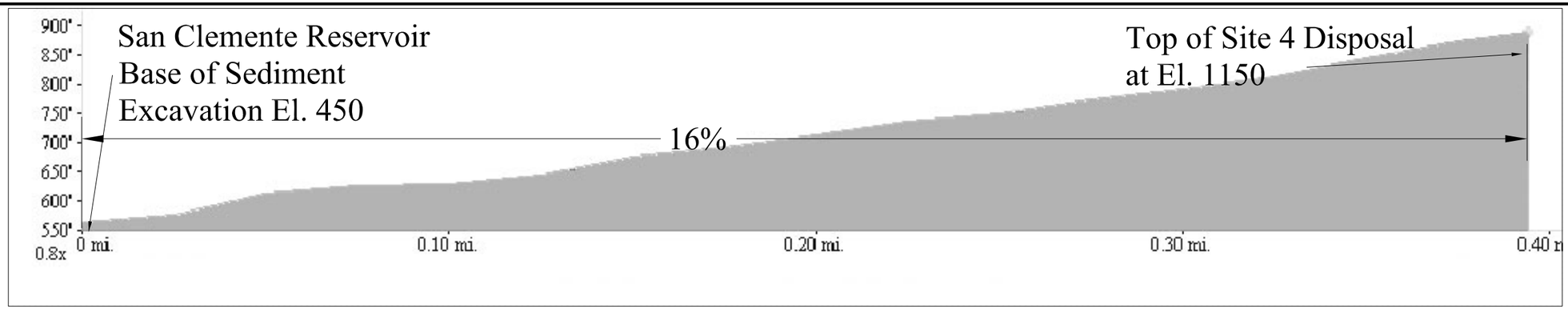
DESIGNED
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MWH
Walnut Creek
California

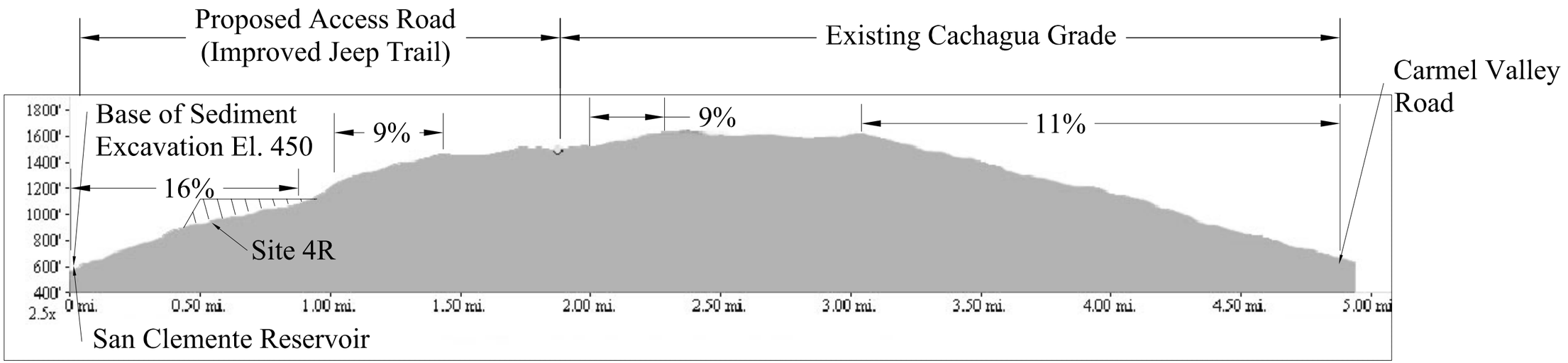
CALIFORNIA AMERICAN WATER

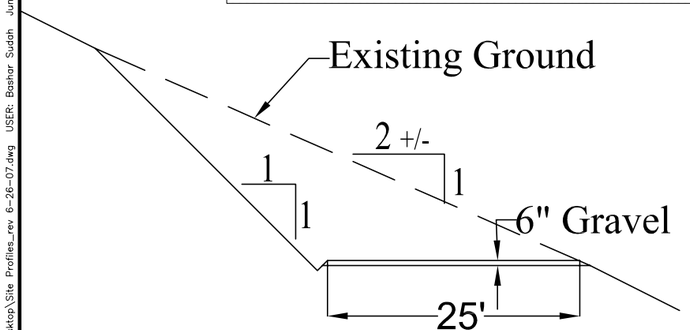
SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
PROFILE OF ROUNDTRIP TRUCK ROUTE TO SITE 1

FIGURE 8



Profile of Truck/Slurry/Conveyor Route Between San Clement Reservoir and Site 4R





Typical Haul Road Section to Site 4R

Scale: 1" = 15'

Profile of Access Road to Site 4R via Cachagua Grade

XREF: BDR
FILE: C:\Documents and Settings\bashar sudah\Desktop\Site Profiles_rev 6-26-07.dwg USER: Bashar Sudah Jun 27, 2007 1:11pm Job No: 1004231

REV	DATE	BY	DESCRIPTION

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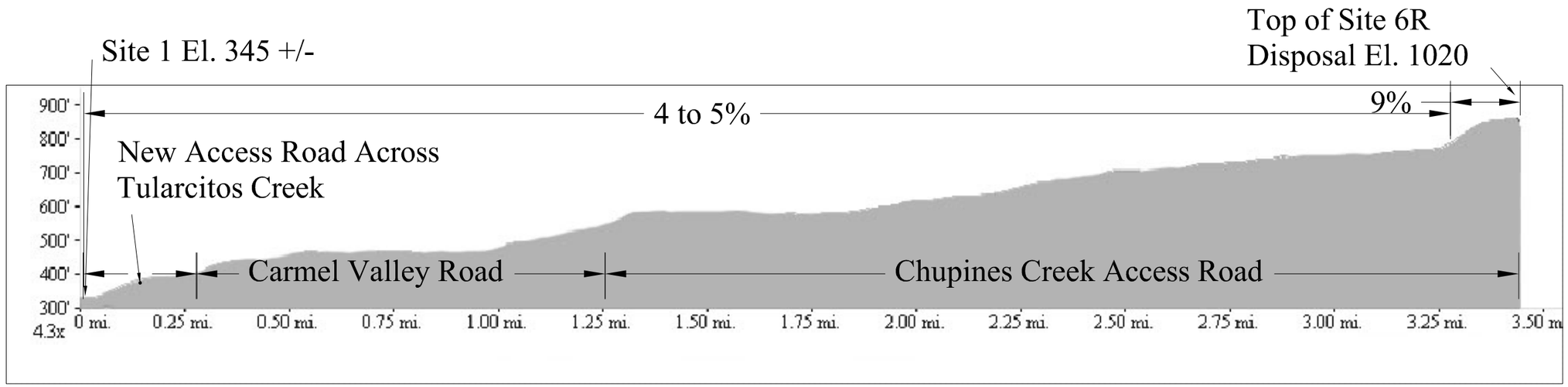
DESIGNED
DRAWN
CHECKED

MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
PROFILES: SITE 4R TRUCK/SLURRY/CONVEYOR ROUTE

FIGURE 9



Profile of Truck Route from Site 1 to Site 6R - Truck Route via Carmel Valley Road

XREF: BDR
FILE: F:\Shared\Working Projects\Cal Am Water\Alternative 3 – Dam Notching\Figures\Site Profiles.dwg USER: visaohalo Mar 10, 2005 11:03am Job No: 1004231

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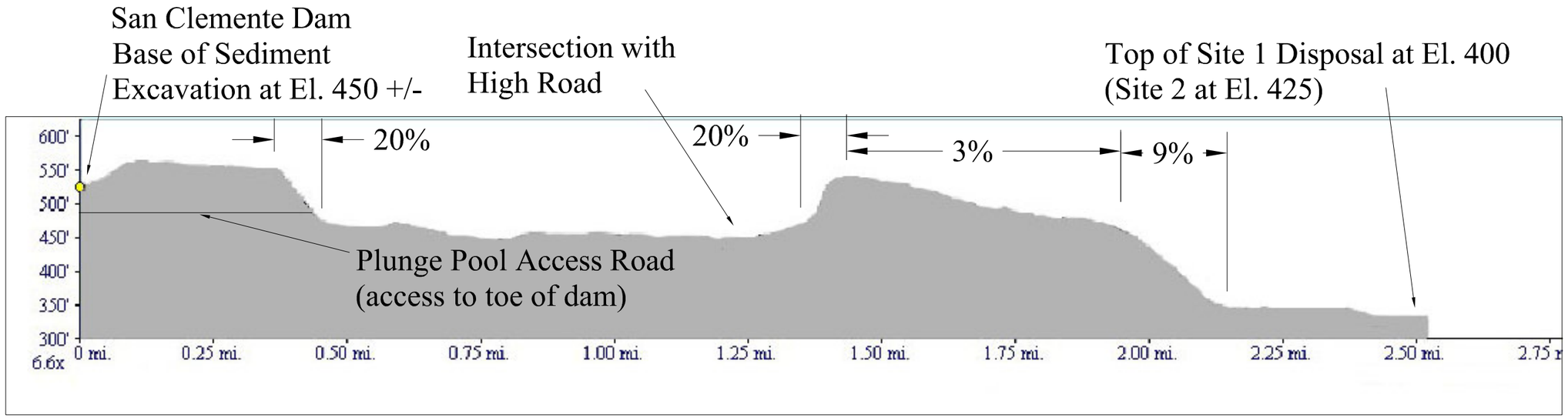
DESIGNED
DRAWN
CHECKED

MWH
Walnut Creek
California

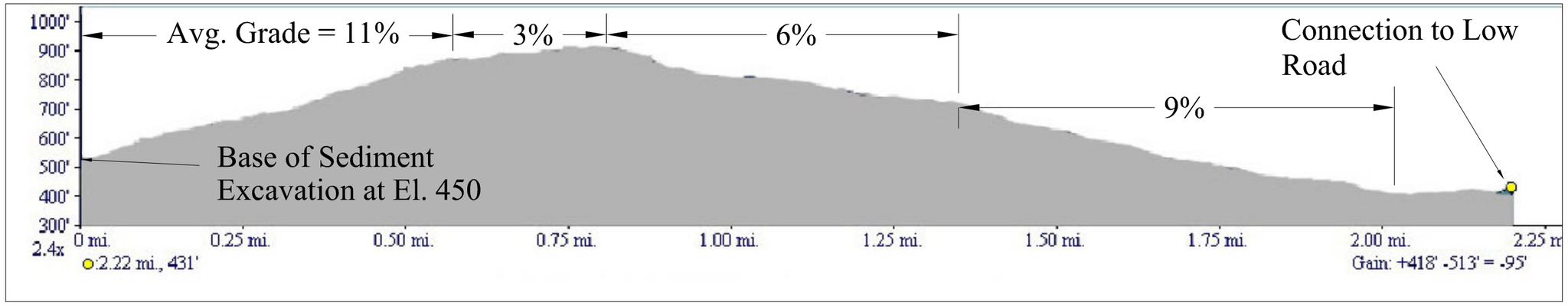
CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
PROFILE OF TRUCK ROUTE FROM SITE 1 TO SITE 6R

FIGURE 10



Site 1 Profile - Conveyor/Slurry Route (via Plunge Pool Access Road, San Clemente Drive, and Pipeline Access Road



Site 1 Profile - High Road

REV	DATE	BY	DESCRIPTION	SCALE	WARNING	DESIGNED	DRAWN	CHECKED
					0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE			

MWH
Walnut Creek
California

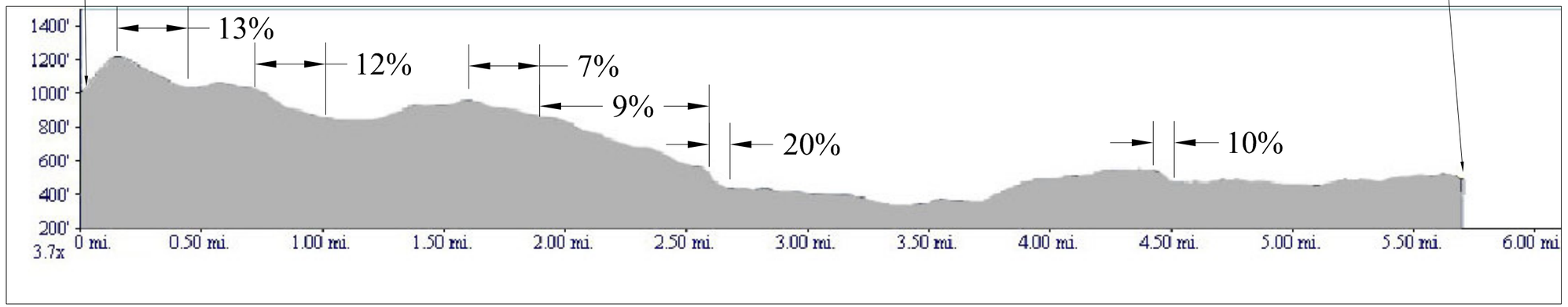
CALIFORNIA AMERICAN WATER
SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
PROFILE OF CONVEYOR/SLURRY ROUTE TO SITE 1

FIGURE 11

XREF: BDR
FILE: F:\Shared\Working Projects\Cal Am Water\Alternative 3 – Dam Notching\Figures\Site Profiles.dwg USER: visaohalo Mar 10, 2005 11:06am Job No: 1004231

Top of Site 6 Disposal
at El. 1020

San Clemente Dam
Base of Sediment
Excavation El. 450



Profile of Conveyor/Slurry Route to Site 6R

REV	DATE	BY	DESCRIPTION

SCALE

WARNING
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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

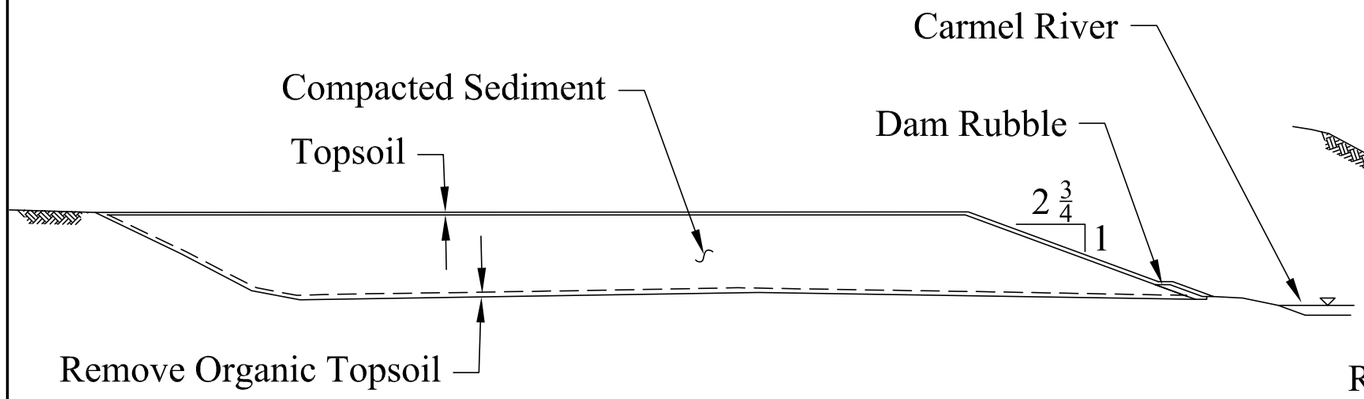
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MWH
Walnut Creek
California

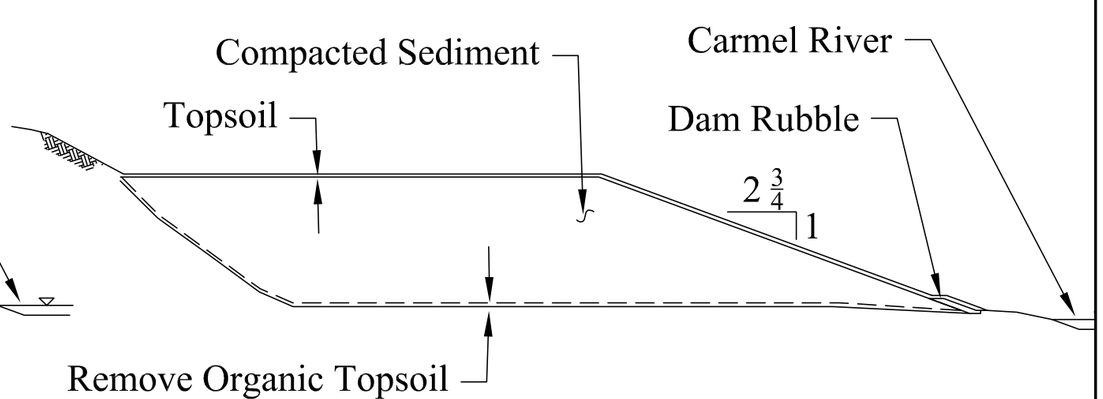
CALIFORNIA AMERICAN WATER
SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
PROFILE OF CONVEYOR/SLURRY ROUTE TO SITE 6R

FIGURE 12

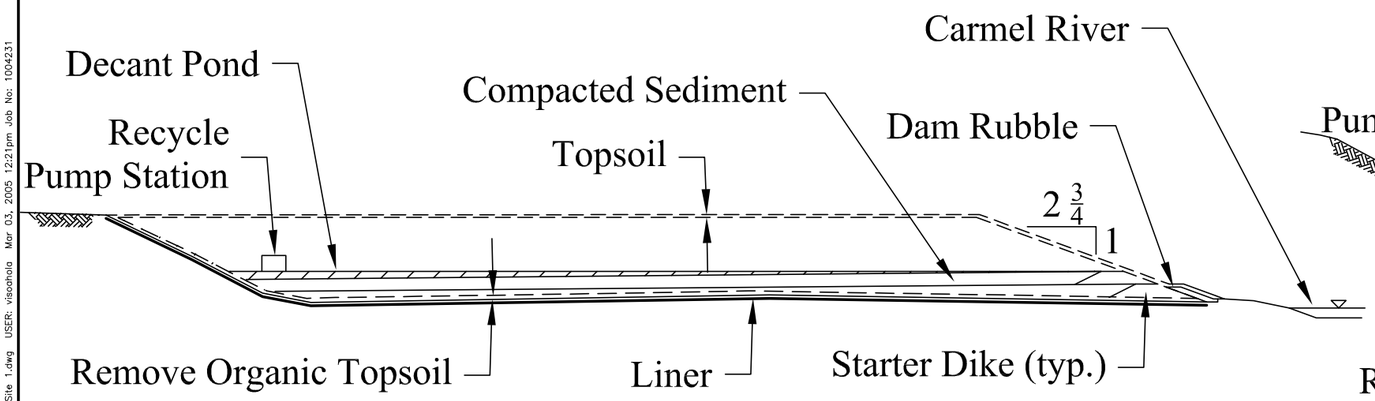
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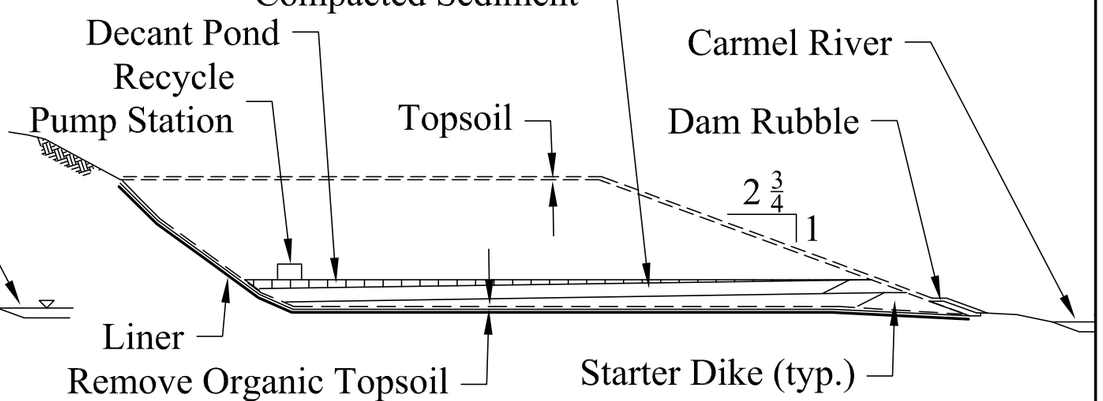
Site 1 Cross Section - Compacted Sediment
(Conveyor Delivery)



Site 2A Cross Section - Compacted Sediment
(Conveyor Delivery)



Site 1 Cross Section - Compacted Sediment
(Slurry Delivery)



Site 2A Cross Section - Compacted Sediment
(Slurry Delivery)

0 50 100
FEET

REV	DATE	BY	DESCRIPTION

SCALE

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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

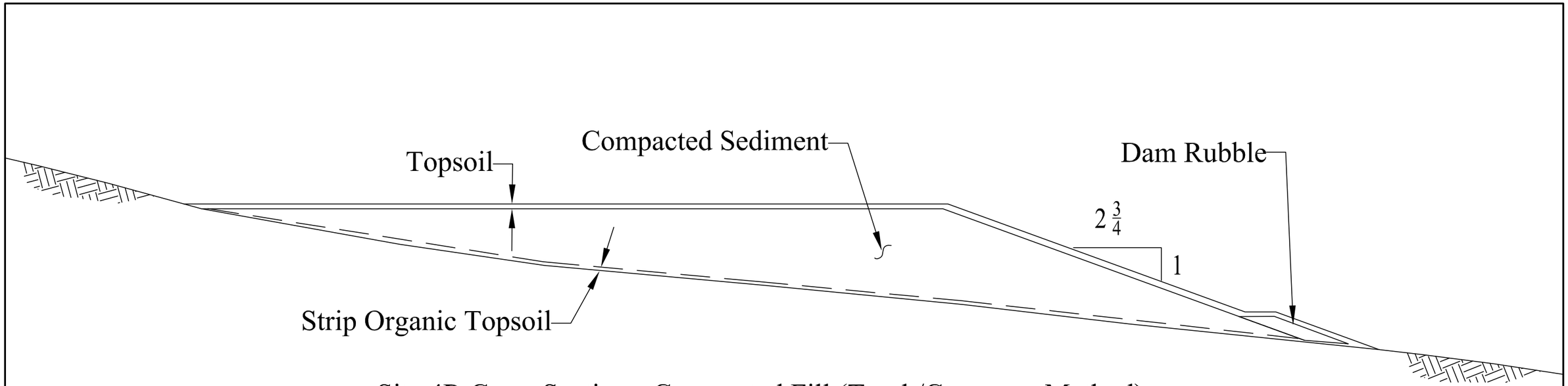
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DRAWN
CHECKED

MWH
Walnut Creek
California

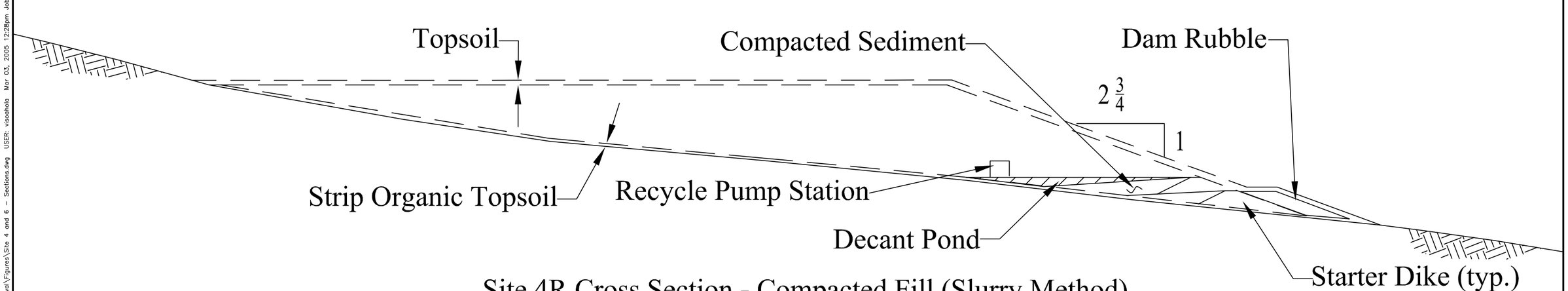
CALIFORNIA AMERICAN WATER
SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
SEDIMENT DISPOSAL SITES 1 AND 2A CROSS SECTIONS

FIGURE 13

XREF: X-TOPO CONTOURS CAL-AM BDR
FILE: F:\Shared\Working Projects\Cal Am Water\Alternative 2 - Dam Removal\Figures\Site 1.dwg USER: vsoohola Mar 03, 2005 12:21pm Job No: 1004231



Site 4R Cross Section - Compacted Fill (Truck/Conveyor Method)



Site 4R Cross Section - Compacted Fill (Slurry Method)

XREF: BDR
FILE: F:\Shared\Working Projects\Cal Am Water\Alternative 2 – Dam Removal\Figures\Site 4 and 6 – Sections.dwg USER: visaohola Mar 03, 2005 12:28pm Job No: 1004231

REV	DATE	BY	DESCRIPTION

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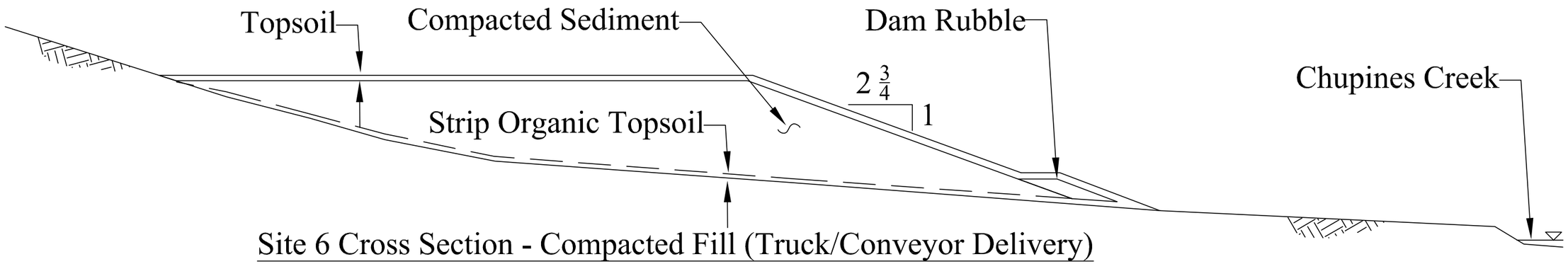
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DESIGNED
DRAWN
CHECKED

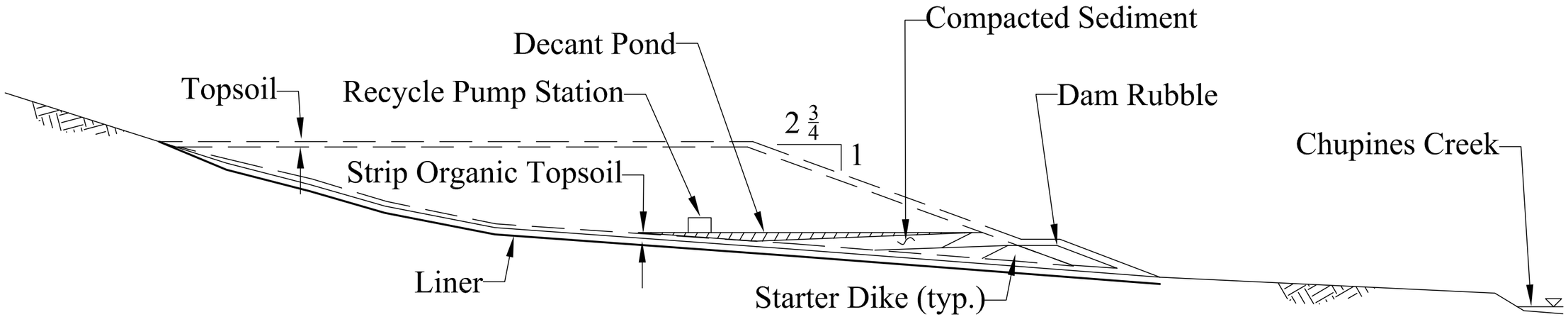
MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER
SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
SEDIMENT DISPOSAL SITE 4R CROSS SECTIONS

FIGURE 14



Site 6 Cross Section - Compacted Fill (Truck/Conveyor Delivery)



Site 6 Cross Section - Compacted Fill (Slurry Delivery)

0 200 400
FEET

REV	DATE	BY	DESCRIPTION

SCALE

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED
DRAWN
CHECKED

MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER
SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
SEDIMENT DISPOSAL SITE 6R CROSS SECTION

FIGURE 15

XREF: BDR
FILE: F:\Shared\Working Projects\Cal Am Water\Alternative 2 - Dam Removal\Figures\Site 4 and 6 - Sections.dwg USER: visadhola Mar 10, 2005 11:09am Job No: 1004231

FINAL Environmental Impact Report /
Environmental Impact Statement

San Clemente Dam Seismic Safety Project

volume 4, Appendices H - Z





January 2008



Prepared for

California Department of Water Resources
U.S. Army Corps of Engineers

US Army Corps of Engineers®

SCH 1 #997042007

FINAL

Environmental Impact Report
Environmental Impact Statement

for the

San Clemente Dam Seismic Safety Project

Prepared for

California Department of Water Resources

U.S. Army Corps of Engineers

Volume 4, Appendices H-Z

January 2008

Volume 4

APPENDICES H - Z

Appendix H

SEDIMENT TRANSPORT & DISPOSAL ENVIRONMENTAL CONSTRAINTS ANALYSIS

APPENDIX H

SEDIMENT TRANSPORT & DISPOSAL ENVIRONMENTAL CONSTRAINTS ANALYSIS

One of the most difficult challenges in implementing the dam notching and removal alternatives was to find a feasible site for permanent disposal of the sediment to be excavated from the reservoir. The site had to have enough capacity to contain the sediment, had to be located in the immediate vicinity of the reservoir and be easily accessible from it, and had to be remote enough so that the sediment transport activities can be conducted with a minimum of impact to the surrounding communities.

Several studies of potential sediment disposal sites and sediment excavation and transport methods have been conducted over the years. Moffatt & Nichol (1996) evaluated an array of potential sediment disposal sites, ranging from disposal sites in the vicinity of the reservoir to distant sites where the sediment could potentially be used for beach replenishment or restoration of military grounds. Not surprisingly, it was found that disposal costs would increase proportionally to the distance between the reservoir and the disposal site. Subsequently, the California Department of Water Resources (DWR) identified potential disposal sites in a regional map of the San Clemente Dam area (DWR 2002).

More recently, for the current EIS/EIR effort, MWH and ENTRIX considered several sites within three miles from the reservoir (shown on Figure H-1), including the sites identified by DWR, and evaluated several potential sediment excavation and transport methods as presented in the “Technical Memorandum on Screening of Sediment Disposal Sites” (MWH, 2005) included in Appendix A. A preferred site, referred to as Site 4R, was selected based on the results of this and previous studies. Site 4R is closest to the reservoir and by far the most advantageous site of those considered from an engineering standpoint. While the site is higher in elevation than the reservoir, transport costs and energy consumption associated with sediment disposal operations would still be lowest for this site versus the other sites considered. Site 4R is relatively remote and therefore the interface between construction operations and the public would be reduced. Because of its remoteness, sediment removal could proceed in two daily shifts without disturbing neighboring communities, thus resulting in a shorter schedule than for some of the other sites considered.

E.1 INTRODUCTION & APPROACH

As part of the San Clemente Dam Seismic Safety EIR/EIS, ENTRIX conducted a preliminary screening environmental constraints analysis for the potential major sediment disposal sites and conveyance routes identified for the project by MWH. The purpose of the screening analysis was to rank the sediment transport and disposal alternatives qualitatively in terms of their environmental constraints.

LEGEND:

TRUCK ROUTE
SLURRY PIPELINE ROUTE
CONVEYOR ROUTE

OLD CARMEL RIVER DAM BRIDGE CROSSING

LOW ROAD (ONE WAY TRUCK ROAD FROM DAM)

PLUNGE POOL ACCESS ROAD

CONVEYOR ROUTE

TRAFFIC CONTROL AND CONVEYOR ROUTE

SITE 1

ONE WAY TRUCK ROUTE TO FILTER PLANT

TWO-WAY TRUCK ROUTE FROM FILTER PLANT TO CARMEL VALLEY ROAD

SITE 2A

ONE-WAY TRUCK ROAD TO DAM, SLURRY PIPELINE, AND CONVEYOR ROUTE

SLURRY PIPELINE ROUTE

0 1000 2000
FEET

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MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
PLAN OF SEDIMENT DISPOSAL SITES 1 AND 2A

FIGURE 2

XREF: X-TOPO CONTOURS CAL-AM BDR
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The environmental constraints analysis was used by the San Clemente Dam Seismic Safety Project Core Team in conjunction with an engineering screening conducted by MWH to select a preferred sediment transport and disposal alternative to be used in the EIR/EIS for all dam alternatives that require offsite sediment disposal (the dam removal and dam notching alternatives).

The sediment transport and disposal alternatives environmental constraints were evaluated qualitatively. Each site was ranked according to environmental constraints identified for (1) cultural and visual resources; (2) land use and land ownership; (3) traffic and safety; and (4) terrestrial biology. An integrated matrix was developed to present the relative ranking of each of the sediment transport and disposal alternatives for each of the four areas of environmental constraint. At the Core Team meeting held in Sacramento CA on March 29, 2005, the Core Team considered the simple ranking and discussed the weight accorded to each criteria to determine an overall rank. Based on the environmental matrix and engineering review, the Core Team established an overall ranking for both transport and disposal, and selected Site 4R as the preferred sediment disposal alternative. The preferred sediment transport method was a mix of road and conveyor belt: sediment will be directly transported to Site 4R via conveyor belt from the east side of the reservoir. Site 4R will also be accessed by road from the east, by improving an existing jeep trail leading from Cachagua Grade to the site.

The selected sediment transport and disposal alternative is analyzed in more detail in the EIR/EIS. Each dam alternative include an evaluation of the existing environment, impacts and mitigation for the selected sediment transport and disposal alternative.

E.2 SEDIMENT TRANSPORT & DISPOSAL ALTERNATIVES

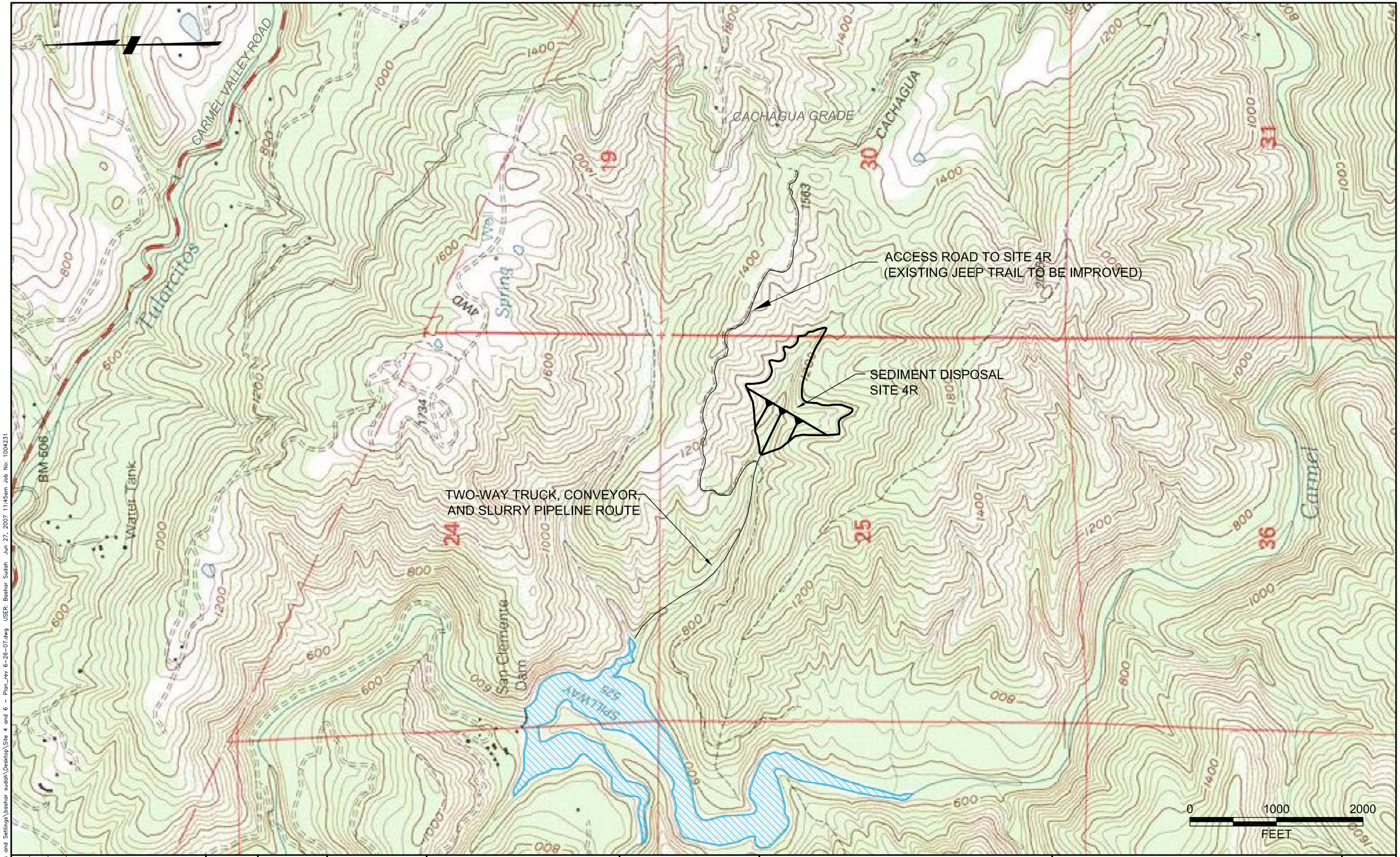
Four potential major sediment disposal sites were identified by MWH during engineering screening (Figure H-2 and Figure H-3):

- Site 1 is a 20 acre site 2.5 miles north of San Clemente Dam, near the confluence of Tularcitos Creek and the Carmel River, downstream of the Carmel Valley Filter Plant.

- Site 2A occupies 17 acres across the Carmel River from Site 1, on the site of the Stone Pine horse track. Sites 1 and 2A would be paired for sediment disposal in order to develop sufficient capacity to receive the entire volume of sediment accumulated behind San Clemente Dam.

- Site 4R is a 23 acre site located in a ravine 0.6 miles east of San Clemente Reservoir.

- Site 6R is a 23 acre site located in a ravine within Rancho Chupinos, 5.7 miles north of SCD and 2.1 miles north of Carmel Valley Road.



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Walnut Creek
California

CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
PLAN OF SEDIMENT DISPOSAL SITE 4R

FIGURE 4

XREF: BDR
FILE: C:\Documents and Settings\bashar sudah\Desktop\Site 4 and 6 - Plan_rev 6-26-07.dwg USER: Bashar Sudah Jun 27, 2007 11:45am Job No: 1004231

LEGEND:

TRUCK ROUTE
SLURRY PIPELINE ROUTE
CONVEYOR ROUTE

SEDIMENT DISPOSAL SITE 6R

TWO-WAY TRUCK ROAD

CONVEYOR ROUTE

SLURRY PIPELINE ROUTE

OLD CARMEL RIVER DAM BRIDGE CROSSING

LOW ROAD (ONE WAY TRUCK ROAD FROM DAM)

PLUNGE POOL ACCESS ROAD

TRAFFIC CONTROL SECTION

ONE WAY TRUCK ROUTE TO FILTER PLANT

TWO-WAY TRUCK ROAD FROM FILTER PLANT TO SITE 6R

ONE-WAY TRUCK ROAD TO DAM

HIGH ROAD (ONE WAY TRUCK ROAD TO DAM)

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CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
PLAN OF SEDIMENT DISPOSAL SITE 6R

FIGURE 6

XREF: BDR
FILE: F:\Shared\Working Projects\Cal Am Water\Alternative 2 – Dam Removal\Figures\Site 4 and 6 – Plan.dwg USER: wsaohola Mar 10, 2005 11:55am Job No: 1004231

Three methods of sediment conveyance were identified for engineering screening: slurry pipeline, conveyor belt, and trucking.

- Sites 1 and 2A could be served by slurry or conveyor.
- Site 4R could be served by any of the three methods.
- Site 6R could be served directly by slurry or conveyor, or by conveyor to Site 1 followed by trucking from there.

FIELD RECONNAISSANCE & EVALUATION

On March 22 and 23, 2005, ENTRIX conducted field reconnaissance to inspect the three potential sediment disposal sites and their associated transport routes. Table H-1 provides a summary evaluation of the environmental constraints. Each row of the table presents the criteria used in environmental constraints analysis; the table columns present each of the sites evaluated.

SITES 1 AND 2A

Cultural Resources

Neither Site 1 nor Site 2A contains visible cultural resources. Site 1 is heavily overgrown and ground visibility is very limited. Field reconnaissance did not observe any structure or other potentially historic resource or evidence of past activities in the area. No surface evidence of archaeological resources was evident. Site 2A is currently used as an equestrian racetrack. None of the associated facilities appeared to be greater than 50 years old and no historic resources were visible. The ground has been graded for the track, and no archaeological resources were evident.

Land Ownership

CAW owns both sites. Site 2A is leased to Stone Pine horse stables. The western and northern edges of site may encroach on property owned by a private landowner.

Land Use

Site 1 is currently vacant, although two wells are present on the site. The site's topography is relatively flat and sparsely vegetated with shrubs. The site is adjacent to two existing residences, one of which has tennis courts. Access to the residences is from San Clemente Drive, which is a private road. The residences are located southeast of Site 1, approximately 1,000 to 1,500 feet from the site. The tennis court is approximately 200 feet from the site. The Carmel River is located directly west of the site.

Table H-1: Summary of Sediment Transport and Disposal Environmental Constraints Analysis			
Criteria	**Sediment Transport/Disposal Alternative**		
	Site 1/2A	**Site 4R**	**Site 6R**
Cultural/Visual	No visible cultural resources. One record of cultural resources at Site 1 (possible village site identified in RDEIR). Greatest potential for cultural resources based on landforms. Sites are visible to existing residences and horse stables.	No visible cultural resources. No records of cultural resources. Little potential for cultural resources based on landforms. Sites are not visible to existing residences.	No visible cultural resources. No records of cultural resources. Medium potential for cultural resources based on landforms. Site is visible to ranch home but not other nearby residences.
Land Use/Land Ownership	CAW is landowner, disposal may encroach on nearby private land-owner. Disposal Site 1 adjacent to two residences, one with tennis courts. Site 2A leased to Stone Pine horse stables, used as equestrian racetrack. Transport route exists and is owned by CAW.	Monterey Peninsula Regional Park District is landowner (no conversations held with District). Disposal site is located in steep, densely vegetated canyon. Hunting cabin ca. 1.5 miles west. Transport route crosses densely vegetated land owned by Park District.	Private landowner (initial conversations indicate a willing seller). Disposal site is located in open, rolling rangeland. Rancher's home and outbuildings located on the property. Transport route crosses lands owned by CAW and private landowners. Primary uses in vicinity are ranching and open space.
Traffic & Safety	Trip generation (500 yds/hr): none (use slurry pipeline or conveyor belt) No traffic related impacts during transport operations.	With truck transport (500 yds/hr), trip generation = 46 trips/hour, 828 trips/day for 3 construction seasons. No direct impacts by haul operations to other public and private roads. Using Cachagua Road for construction and dam access may impact Cachagua Road (poor geometrics), Carmel Valley Road/Cachagua Road intersection (poor sight distance), and Cachagua Road/Jeep Trail/Dam Access Road intersection (sight distance).	With truck transport (500 yds/hr), trip generation = 76 trips/hour, 760 trips/day for 5 construction seasons assuming truck transport. Impacts to Carmel Valley Road occur at the intersections with the Tularcitos Access Road and Chupines Canyon Access Road. Left turn channelization would be required at each location on Carmel Valley Road. Potential pavement impacts to Carmel Valley Road between the two access roads.
Terrestrial Biology	Habitat: approximately 2.64 miles of vegetation (route). Disposal site occupies grasslands, coast live oak forest, riparian and developed lands, all adjacent to riparian zone.	Habitat: 1.56 miles (route) and 3.23 acres (site) of undisturbed or relatively undisturbed habitat. Disposal site is primarily undisturbed coast live oak woodland. No stream crossings.	Habitat: approximately 5.4 miles of vegetation (similar to Site 1 with an additional 3 mile route primarily in previously cultivated non-native grassland). Disposal site in previously cultivated non-native grassland.

Table H-1: Summary of Sediment Transport and Disposal Environmental Constraints Analysis			
Criteria	**Sediment Transport/Disposal Alternative**		
	Site 1/2A	**Site 4R**	**Site 6R**
	One stream crossing (Carmel River). Sensitive habitats: riparian vegetation adjacent to disposal site. Sensitive species: California tiger salamander, California red-legged frog, western pond turtle, Cooper's hawk, yellow warbler, and Monterey dusky-footed woodrat. Large native oaks.	Sensitive habitats: 0.03 to 1.11 acres of blue oak woodland and 0.02 acre riparian vegetation Sensitive species: California tiger salamander, California red-legged frog, western pond turtle, Cooper's hawk, yellow warbler, Monterey dusky-footed woodrat, and Carmel Valley malacothrix. Many large native oaks.	One stream crossing (Tularcitos Creek) Sensitive habitats: riparian vegetation. Sensitive species: California tiger salamander, California red-legged frog, western pond turtle, Cooper's hawk, yellow warbler, and Monterey dusky-footed woodrat. Large native oaks.

Site 2A is located on the lowest terrace, just west of and above the Carmel River. Land uses on the site include an active horse race practice track, with accompanying barns and fences adjacent to the site and to the north of the site. The Carmel River is located to the east of the site.

The transport routes to the sites are owned by CAW. Land uses in the vicinity of these routes include buildings associated with the Carmel Valley Filter Plant and open grassy areas.

Terrestrial Biology

This alternative would use the existing "low road" to the dam. Any work along the low road potentially could impact riparian vegetation. From the filter plant, the route extends through grassland and coast live oak forest, paralleling the riparian zone. The eastern sediment disposal site (Site 1) is in a grassland/coast live oak/riparian area. The western sediment disposal site (Site 2A) is currently used as a racetrack, with a grassy center oval that is mowed.

Potential impacts to terrestrial biological resources along this route (approximately 2.03 miles) include the probable loss of several large coast live oaks, potential impacts to sensitive riparian vegetation, and potential habitat loss for several special status species, including California tiger salamander, California red-legged frog, western pond turtle, Cooper's hawk, yellow warbler, and Monterey dusky-footed woodrat. This route has one water crossing at the Carmel River.

Traffic & Safety

This site would be served entirely by conveyor belt or slurry pipeline, and would have no traffic-related impacts.

SITE 4R

Cultural Resources

Site 4R was inaccessible during the field reconnaissance due to the weather and road conditions. However, based on the topographic map, no significant cultural resources would be expected to be found in the site area. The site is located in a deep ravine, with a relatively steep slope to the Carmel River below. Previous site visits by the team field biologist and engineer had identified no structures located within the site area. There is an old hunting camp or homestead near the site, but not within the probable area of potential effect. The landform is not conducive to prehistoric site types found in the area, and it is considered very unlikely that archaeological resources would be found within the boundaries.

Land Ownership

Monterey Peninsula Regional Park District is the owner. There is no indication as to the willingness of the District to receive sediment for disposal at this site.

Land Use

The site is vacant, located in a canyon, and is filled with dense vegetation, largely coast live oaks. Dense vegetation surrounds the site on all sides. Access to the site is from a gated dirt road. Land uses in the vicinity include a hunting cabin located approximately 1.5 miles west of the site. Cachagua Road, east of the site, is a paved road. Some residences are located along Cachagua Road, but are located far from the site itself, and due to the surrounding topography and vegetation have no visibility of the site.

The transport route traverses land owned by the Monterey Peninsula Regional Park District. Land uses on and in the vicinity of the conveyor belt route include vacant land with dense vegetation. Land uses on and in the vicinity of the jeep trail include vacant land covered with a mix of dense vegetation and open, grassy areas.

Terrestrial Biology

The sediment transport route extends east from an arm of San Clemente Reservoir to an uphill sediment disposal site. It also includes access (jeep trail) from Cachagua Road. This route requires the construction of a conveyor belt from the reservoir to the disposal site, improvement of the jeep trail, and possibly some improvements to Cachagua Road. This route passes through riparian vegetation fringing San Clemente Reservoir, through coast live oak vegetation and annual grassland, to the sediment disposal site situated in coast live oak vegetation. The jeep trail passes through coast live oak forest, annual grassland, and some scrub vegetation. Vegetation along Cachagua Road is primarily coast live oak forest, but also includes patches of non-native annual grassland and various scrub communities.

Potential impacts to terrestrial biological resources along this route (1.56 to 4.65 miles) are the probable loss of numerous large coast live oaks, loss of at least 3.23 acres of undisturbed or relatively undisturbed habitat, potential loss of 0.03 to 1.11 acres of blue oak woodland, the loss of 0.02 acre riparian vegetation, and potential habitat loss for several special status species. This estimate is based only on use of the site for sediment transport, and therefore includes all impacts for the route. The additional acreage for the disposal site is primarily in undisturbed coast live oak forest, in a potential ephemeral drainage.

Traffic & Safety

Tables H-2 and F-3 describe the sediment transport routes and summarize their deficiencies, potential impacts, and potential mitigation measures.

Truck trip generation required to remove sediment from this site would amount to 46 trips/hour, or 828 trips/day for 3 construction seasons. If slurry/conveyor transport is used, no truck trips are required during sediment transport operations.

Table H-2: Description of Alternative San Clemente Dam Sediment Transport Routes

Table ##-2. Description of Alternative San Clemente Dam Sediment Transport Routes

DISPOSAL SITE	ROUTE SEGMENT		ROAD TYPE	APPROXIMATE LENGTH	DAILY TRAFFIC VOLUME	DESIGN CHARACTERISTICS							
						EXISTING				FUTURE WITH PROJECT			
						LANES	WIDTH (FEET)	SHOULDERS	SURFACE	LANES	WIDTH (FEET)	SHOULDERS	SHOULDERS
4R													
	New Haul Road	Dam - Disposal Site 4R	Private - Dam Access	0.6 miles	-	N/A	N/A	N/A	N/A	2	25	0	N/A
6R													
	Tularcitos Access Road	Site 1 - Carmel Valley Rd	Private - Dam Access	0.3 miles	-	N/A	N/A	N/A	N/A	2	22	0	N/A
	Carmel Valley Road	Tularcitos Access Road - Chupines Access Road	Public-Rural Highway	1.0 miles	1750-2100	2	20 to 24	Minimal	sphalt Con	2	20 to 24	Minimal	Asphalt Conc.
	Chupines Access Road	Carmel Valley Road - Disposal Site 6R	Private - Ranch Access F	2.2 miles	-	1		Minimal	Dirt	2	22	0	Dirt

Notes

[1]Future design based upon designs prepared and/or proposed in conjunction with previous San Clemente Dam Seismic Retrofit planning and design studies.

Table H-3: Summary of Deficiencies, Potential Impacts and Mitigation for Sediment Transport Routes

ACCESS ROUTE	DEFICIENCIES/POTENTIAL IMPACTS	POTENTIAL MITIGATION MEASURES
4R	1. Potential traffic impacts associated with this alternative are not related to the road segment between the dam and the disposal site, but to the possible use of Cachagua Road as a dam access route. Deficiencies associated with Cachagua Road are described in Table 2A under the Cachagua Access Route.	1. See Table 2A, Cachagua Access.
6R (Truck Haul)	1. The proposed design of Tularcitos Access Road between Site 1 and CVR includes a single lane bridge over Tularcitos Creek and two horizontal curves immediately south of CVR. The design will not allow two-way truck travel on these segments.	1. Traffic control will be necessary during high truck volume construction periods. Widening to allow two-way operations is recommended if Tularcitos Creek Access Road is used for sediment disposal.
	2. The truck volumes generated under either medium and high truck volume conditions associated with sediment disposal to Site 6R will warrant left turn channelization on the westbound CVR approach to the Tularcitos Access Road and a right turn acceleration lane for movements from the Tularcitos Access Road to eastbound CVR.	2. Widen CVR to provide left turn channelization on the westbound CVR approach to the Tularcitos Access Road and a right turn acceleration on eastbound CVR east of Tularcitos Access Road.
	3. The truck volumes generated under either medium and high truck volume conditions associated with sediment disposal to Site 6R will warrant left turn channelization on the eastbound CVR approach to the Chupines Canyon Access Road and a right turn acceleration lane for movements from the Chupines Canyon Access Road to westbound CVR.	3. Widen CVR to provide left turn channelization on the eastbound CVR approach to the Chupines Canyon Access Road and a right turn acceleration on westbound CVR west of Chupines Canyon Access Road.
	4. The potential for pavement damage to CVR between the Tularcitos Access Road and the Chupines Canyon Access Road is high.	4. Pavement maintenance and overlay as required.

There are no direct impacts by haul operations to other public and private roads. Using Cachagua Road for construction and dam access could cause potential impacts on Cachagua Road due to poor geometrics, at the Carmel Valley Road/Cachagua Road intersection due to poor sight distance, and at the Cachagua Road/Jeep Trail/Dam Access Road intersection due to sight distance.

SITE 6R

Cultural Resources

No cultural resources were visible at Site 6R. The area is currently operated as rangeland. The property owner indicated that the land may have been used for dairy farming in the past. A large portion of his property was previously cultivated, especially areas over which the transport route would pass. The site area contained no visible evidence of structures or archaeological remains.

Land Ownership

This site is owned by a private landowner who has indicated a willingness to receive sediment for disposal at this site.

Land Use

The site is currently being used for ranching. The grassy, dry site is comprised of rolling hills covered with grass and pockets of dense vegetation. The rancher's home and associated buildings are located on the site. Residences are located approximately 1 mile to the northwest of the site but have no visibility of the site due to the topography. Land use in the immediate vicinity consists of ranching activities in large, grassy open areas.

The transport routes are located on a combination of Cal-Am owned roads (in the vicinity of the San Clemente Dam and at the southern half of the transport routes) and privately owned roads. Land uses in the vicinity of the transport routes include ranching and Dam-associated facilities.

Terrestrial Biology

This route extends along the Carmel River from the dam to the filter plant, east parallel to Tularcitos Creek and Carmel Valley Road, across Carmel Valley Road, and uphill across ranchland to the proposed disposal site. This alternative would place a conveyor belt either along the existing "low road" to the dam, or just below it. Any work along the low road would potentially impact riparian vegetation. From the filter plant, the slurry line would extend through approximately 3300 feet of coast live oak forest before crossing Tularcitos Creek and Carmel Valley Road. At this point, the conveyor belt would extend through primarily through non-native annual grassland, but would include small areas of coast live oak forest. One potential ephemeral drainage would be crossed. The disposal site is in non-native annual grassland that has previously been cultivated.

Potential impacts to terrestrial biological resources along this route are the probable loss of several large coast live oaks, potential impacts to approximately 7.6 miles of vegetation, including sensitive riparian vegetation and over 3500 linear feet in or paralleling coast live oak forest, and potential habitat loss for several special status species, including California tiger salamander, California red-legged frog, western pond turtle, Cooper's hawk, yellow warbler, and Monterey dusky-footed woodrat. This route has one water crossing at Tularcitos Creek.

Traffic & Safety

Tables H-2 and H-3 describe the sediment transport routes and summarize their deficiencies, potential impacts, and potential mitigation measures.

Truck trip generation required to remove sediment from this site would amount to 76 trips/hour, or 760 trips/day for 5 construction seasons. If slurry/conveyor transport is used, no truck trips are required during sediment transport operations.

With truck transport, impacts to Carmel Valley Road would occur at the intersections with the Tularcitos Access Road and Chupines Canyon Access Road. Left turn channelization would be required at each location on Carmel Valley Road. Potential pavement impacts occur to Carmel Valley Road between the two access roads.

H.3 RANKING

Table H-4 provides a comparative ranking of the sediment transport and disposal alternatives. Each row of the table presents the criteria used in environmental constraints analysis; the table columns present each of the sites evaluated. Each of the three site alternatives and its associated transport routes are ranked (1-3) for each of the criteria. In addition, the table notes whether the constraints of the sediment disposal and transport alternative are considered "low", "medium", or "high."

- "Low" constraints are considered not to present important environmental concerns.
- "Medium" constraints are considered to present environmental concerns of some importance, which may require mitigation.
- "High" constraints are considered to present important environmental concerns, and to require mitigation.

The ranking does not imply anything about the constraints a site may have. Ranking simply distinguishes among the three sites on an ordinal scale. For example, two sites may have the same level of constraints but one may be ranked above the other (e.g., see cultural/visual rankings for Sites 4R and 6R). At the bottom of the table, the simple sum of ranking scores is given, and the Core Team decision (to eliminate or select the alternative) is explained.

Table H-4: Sediment Transport and Disposal Environmental Constraints Ranking

Ranking	Sediment Transport/Disposal Alternative		
	Site 1 / 2A	**Site 4R**	**Site 6R**
Cultural/Visual	3. High constraints (greatest potential for cultural resources, possible village site)	1. Low constraints (low potential for cultural resources, no records of known sites)	1. Low constraints (low potential for cultural resources, no records of known sites)
Land Use/Land Ownership	3. Medium constraints (nearby landowners and residential uses; Site 2A would cover existing race practice track)	1. Low constraints (no private land-owners, no conflicting land uses [Park District would need to approve])	2. Medium constraints (private landowner with ranch operations and residence [may be willing seller])
Traffic & Safety	1. Low constraints (trucks would not be used; sediment would be conveyed via conveyor belt or slurry pipeline).	2. Low constraints (no impact to existing public and private roads from sediment haul operations. Initial sediment site preparation and road-building to the reservoir would require access from Cachagua Road, whose geometrics are poor. Minor roadway widening prior to and/or traffic control during construction mobilization would be required.) With slurry pipeline or conveyor transport, traffic constraints would be low.	3. High constraints with truck transport from Site 1 to Site 6R (impacts to Carmel Valley pavement, left turn channelization required on Carmel Valley Road at the Tularcitos and Chupine Canyon access road intersections.) With slurry pipeline or conveyor transport, traffic constraints would be low.
Terrestrial Biology	2. Medium constraints (short route, largely along existing roads, but much of the route parallels or traverses high-value riparian habitat along Carmel River; disposal site in previously disturbed habitat; one stream crossing).	3. High constraints (short route, but disposal site is located in undisturbed native coast live oak woodland, and in an ephemeral stream).	1. Medium constraints (longer route, partly parallels or traverses riparian habitat; disposal site in previously farmed non-native grassland; one stream crossing).
Outcome of Ranking & Core Team Selection	9 points (alternative eliminated because it only marginally accommodates sediment volume, impacts known cultural resources, and has incompatible neighboring land uses and visual impacts)	7 points (alternative selected for further evaluation, including biological impacts and mitigation)	7 points (alternative eliminated due to traffic and safety impacts due to longer route traversing residential areas and Carmel Valley Road)

Cultural Resources

1 – Site 4R and Site 6R

Dense vegetation prevented ground surface observation in most of the sediment disposal areas. All areas are clear of previously recorded cultural resources. Neither site has any surface features that would indicate the probable presence of archeological resources.

3 – Sites 1 and 2A

Based on field reconnaissance the probability of containing archaeological resources would be greatest for Site 1 and 2A (based solely on landforms). A possible village site, CA-MNT-33, was previously recorded at Site One 1 and was identified in RDEIR. The site was reported as partially damaged at that time, and subsurface testing indicated that the site may be eligible for listing on the NRHP. If site 2A was chosen, further research on the equestrian facilities would be required. There is currently no historical information recorded on these buildings.

Land Use & Land Ownership

Although the land is not owned by Cal-Am, Site 4R has the least amount of conflicting land uses on and in the vicinity of the disposal site and transport routes. Site 6R has some conflicting land uses, but fewer than those associated with Sites 1 and 2A. Further, although a residence is located on Site 6R, the property owner has indicated a willingness to selling the property to CAW. While Sites 1 and 2A are owned by Cal-Am, these sites have the most conflicting land uses in and around the sites. There are residences and private recreational uses in close proximity to Site 1, and a conflicting land use (equestrian track) currently exists on Site 2A.

SITE 4R

Rationale: While disposal Site 4R is not owned by Cal-Am, there are no conflicting land uses on or in the vicinity of the site (e.g. residential or recreation), as the site is surrounded by dense vegetation on all sides. Similarly, the transport route options do not have conflicting land uses, and the access roads to the site are private and gated.

SITE 6R

Rationale: Site 6R is not owned by Cal-Am. There are conflicting land uses on the site, including ranching and the residences associated with the ranch. Land uses in the vicinity of the site are ranching. Land uses in the vicinity of the transport routes are ranching and Dam-related facilities. Following disposal, the land could return to its original land use of ranching.

SITES 1 AND 2A

Rationale: Although Cal-Am is the owner of the properties, two residences (one with a tennis court) are located in close proximity to Disposal Site 1 (within 200 feet). Land use on Disposal Site 2A includes an active horse race practice track with associated

buildings. Thus, there would be conflicting land uses in the vicinity of Site 1 and directly on Site 2A. There are no conflicting land uses in the vicinity of the transport routes.

TERRESTRIAL BIOLOGY

Site 6R

Rationale: This rating is based on potential impacts to the additional linear route from the construction access road to the sediment disposal site. This alternative is the longest, but much of the length is through areas of non-native grassland that have previously been cultivated and are currently grazed. Potential impacts to biological resources on this route, including to protected oaks, sensitive habitats, and special-status species, are similar to those for Site 1. However, the disposal site itself on this route is not associated with riparian habitats and provides little habitat for special-status species. Therefore, this route is ranked first on the basis of minimizing impacts to biological resources.

Site 1 and 2A

Rationale: This rating is based on potential impacts to the route from the construction access road to the sediment disposal sites, the two sediment disposal sites themselves, a river crossing to Site 2A, and a conveyor belt from the dam to the disposal sites. Biological resources that may by impacted include protected oaks, sensitive habitats, and special-status species. This alternative is the shortest route, and is primarily along existing roads. However, much of this route is through or adjacent to riparian habitat, and it includes one crossing of the Carmel River. Additionally, one sediment disposal site includes small areas of riparian habitat and is adjacent to other riparian habitat Therefore, this route is ranked second on the basis of minimizing impacts to biological resources.

Site 4R

Rationale: This alternative is intermediate in length, but much of it is through previously undisturbed coast live oak forest. The disposal site itself is primarily in undisturbed coast live oak forest, interspersed with patches of scrub on the north side. Potential impacts to biological resources include impacts to protected oaks, sensitive habitats, and special-status species. Therefore, this route is ranked third on the basis of minimizing impacts to biological resources. However, if this route is used for both sediment disposal and construction access, impacts to habitats below the dam would be reduced from those alternatives requiring improvements to dam access roads.

Traffic & Safety

Table H-5 presents a summary impact rating and ranking of the sediment transport routes for traffic concerns.

Table H-5: Traffic Ranking of San Clemente Dam Alternative Sediment Transport Routes

DISPOSAL SITE	ROUTE SEGMENT		ROAD TYPE	APPROXIMATE LENGTH	DAILY TRAFFIC VOLUME	IMPACT RATING				HAUL ROUTE RATING (RATING x SEGMENT LENGTH)				
						IMPACT TO RESIDENTIAL DEVELOPMENT		ROADWAY GEOMETRICS	PAVEMENT IMPACTS	IMPACT TO RESIDENTIAL DEVELOPMENT		ROADWAY GEOMETRICS	PAVEMENT IMPACTS	TOTAL SCORE
						DIRECT	INDIRECT			DIRECT	INDIRECT			
4R														
	New Haul Road	Dam - Disposal Site 4R	Private - Dam Access	0.6 miles	-	0	0	0	4	0	0	0	2	2
6R														
	Tularcitos Access Road	Site 1 - Carmel Valley Rd	Private - Dam Access	0.3 miles	-	0	0	3	4	0	0	1	1	2
	Carmel Valley Road	Tularcitos Access Road - Chupines Access Road	Public-Rural Highway	1.0 miles	1750-2100	0	0	4	4	0	0	4	4	8
	Chupines Access Road	Carmel Valley Road - Disposal Site 6R	Private - Ranch Access	2.2 miles	-	0	0	0	4	0	0	0	9	9
										0	0	5	14	19

Notes:

1. A high score indicates traffic related environmental impacts and constraints are high; a low score indicates that traffic related environmental impacts and constraints are low.
2. Rating Scale:
   - 0 = No impacts anticipated.
   - 1 = Very low level impacts; impacts can be mitigated.
   - 2 = Low level impacts; impacts can be mitigated.
   - 3 = Moderate level impacts; impacts can be mitigated
   - 4 = High level/significant impacts; impacts can be mitigated.
   - 5 = High level/significant impacts; impacts probably can not be mitigated.
3. Direct Residential Impact: Alternative adds construction related traffic to a local or collector road with residential homes directly fronting onto and accessed from the segment.
4. Indirect Residential Impact: Alternative adds construction related traffic to a segment of a local or collector road that is used to access residential development.
5. Ratings based on medium and high volumes of truck traffic.
6. Rating system evaluates the route as a haul route only. Routes that would be used for construction mobilization and dam access are not considered in the ratings presented in this table.

1 – SITE 1 & 2A

Rationale: This alternative is preferred from a traffic and safety standpoint because trucks would not be used; sediment would be conveyed via conveyor belt or slurry pipeline.

2 – SITE 4R

Rationale: This route has low constraints because there would be no impact to existing public and private roads from sediment haul operations. Initial sediment site preparation and road-building to the reservoir would require access from Cachagua Road, whose geometrics are poor. Minor roadway widening prior to and/or traffic control during construction mobilization would be required.

3 – SITE 6R

Rationale: This route has low constraints due to impacts to Carmel Valley pavement and the left turn channelization required on Carmel Valley Road at the Tularcitos and Chupine Canyon access road intersections.

Appendix I

SAN CLEMENTE DAM COMMERCIAL VALUE OF SEDIMENT IN THE RESERVOIR

M E M O R A N D U M

MWH
MONTGOMERY WATSON HARZA

To:	Fred Feizollahi and Dave Gutierrez	**Date:**	March 9, 2005
From:	Alberto Pujol and Dan Wade	**Reference:**	1004231.010101

Subject: San Clemente Dam
Commercial Value of Sediment in the Reservoir

As you requested in our December 7, 2004 meeting, we have attempted to answer the question of whether the sediment in San Clemente Reservoir has commercial value. We have concluded that while there is commercial value for the sediment, this value at the present time is completely offset by processing and transportation costs and, therefore, there is not a positive benefit-cost ratio for selling the sediment. Although our assessment is predominantly qualitative, we believe that it is sufficient to answer your question. More detailed quantitative evaluations can be made but would require additional effort and, we believe, would result in the same overall conclusion.

Background

San Clemente Reservoir has been estimated to contain approximately 2.5 million cubic yards (or about 3 million tons) of sediment. The sediment consists of sandy gravel, gravelly sand, sand, silty sand, and sandy silt. The finer-grained sediment is located nearest to the dam in both arms of the reservoir, and the coarser (gravelly) materials are encountered in the upper reaches of the Carmel River arm of the reservoir. Generally speaking, the grain size distribution of these materials, as excavated from the reservoir, would not meet typical specification requirements for high-value aggregate products (concrete sand, concrete aggregate, drain rock, base rock, etc.). Therefore, development of reservoir sediment for aggregate products would require the installation and operation of a screening and washing plant and the disposal of waste byproduct (primarily wet silt) from the processing operation in a sediment disposal site. For purposes of this evaluation, we have assumed an aggregate yield of 70%, i.e., we have assumed that about one third of the total volume of sediment would be too silty and would be wasted.

Communication with local aggregate suppliers suggests that aggregate demand could be on the order of magnitude of 200,000 tons per year (Attachment 1), suggesting that development of aggregate resources directly from the reservoir would likely take on the order of ten years. Transport of this quantity of material by highway truck via Carmel Valley Road would entail an average of about 60 truck roundtrips per business day, or about one roundtrip every ten minutes (assuming 10-hour days). In principle, this traffic impact would appear to be not significant, so transport of sand and gravel materials at this rate appears to be realistic.

We considered two main scenarios for development of aggregate resources: (1) aggregate production at the reservoir, and (2) aggregate production at a sediment disposal site. These are described and evaluated below.

On-Site Development of Aggregate Resources

This scenario envisions that sediment would be excavated from San Clemente Reservoir and processed into marketable aggregate products at the reservoir site. The waste byproduct of the processing operation would be transported to a disposal site, and the aggregate materials would be hauled off to the purchaser's site.

Evaluation: Sediment excavation and on-site aggregate processing over a period of time on the order of ten years would be difficult due to (1) the potential for environmental impacts from protracted reservoir dredging and sediment processing operations, and (2) the high cost of winter shutdowns and related annual mobilizations, installation and removal of river diversion facilities, operation of reservoir dewatering equipment, fish rescue operations, and other environmental compliance activities. Protection and mitigation measures for steelhead and California Red-Legged Frog (CRLF) during reservoir dredging operations were developed by Entrix (2004). Cost estimates prepared by Entrix and Granite Construction for annual stream diversion, dewatering, and environmental protection activities suggest that the incremental cost of these activities alone (i.e., not including the cost of sediment excavation, processing and transport operations) would be on the order of $3 million per year, or about $15 per ton of aggregate at a production rate of 200,000 tons per year. This incremental cost of environmental protection related to long-term on-site aggregate development is higher than the current price of processed aggregate at commercial sources, and therefore is higher than the revenue that could be derived. Therefore, we do not believe this to be a realistic scenario. It appears to us that from the point of view of both cost and environmental impact considerations, the removal of San Clemente Dam and its impounded sediment would need to occur over as short a time span as possible (a small number of years) in order for it to be practicable.

Development of Aggregate Resources at Disposal Site

This scenario assumes that Cal-Am moves the sediment as expeditiously as possible to a disposal site near a local highway. The question then is whether there would be a positive benefit-cost ratio in mining the sediment at the disposal site, i.e., whether the revenue from the aggregate sales would exceed the incremental costs of processing, transporting and selling the aggregate. Potential development approaches are described and evaluated below:

(1) **Mineral resources company buys the sediment "as-is," excavates it from the sediment pile, loads it on trucks, hauls it to its processing plant, processes it, disposes of the waste by-product, and sells the processed aggregate.** Operating expenses for Cal-Am could include commercial license fees, ongoing disposal site maintenance and restoration costs, ongoing disposal site environmental monitoring and mitigation costs, and legal and administration costs related to community concerns. We briefly discussed this approach with Graniterock, a leading local mineral resources

company. However, Graniterock would not be interested because of the high cost of transporting the material to its processing facility (see Attachment 1). Indeed, if we assume a cost of $2 per ton to excavate and load the sediment, 25 to 30 cents per ton-mile to haul it, $3 to $4 per ton to process it and dispose of waste material, and an aggregate yield from the sediment of 70%, it would appear that a haul distance in excess a few miles would render this approach uneconomical, i.e., the cost of this operation to the mineral resource developer would exceed the proceeds from the aggregate sales.

(2) **Mineral resources company installs an aggregate processing facility at Cal-Am's sediment disposal site, excavates sediment from the sediment pile, processes it, disposes of the waste by-product on site, and stockpiles and sells the processed aggregate.** The cost of this operation to Cal-Am could also include commercial license fees, site maintenance and restoration, environmental monitoring and mitigation, and legal and administration costs related to community concerns. Because of the greater level of industrial activity at the site, environmental risks and community relations risks would be higher. Under this approach Graniterock potentially would pay a nominal amount of $.50 per ton (see Attachment 1). However, at a production rate of about 200,000 tons per year, the resulting revenue to Cal-Am ($100,000 per year) would be highly unlikely to cover Cal-Am's costs. We conclude that this approach does not present value for Cal-Am.

(3) **Cal-Am's dam removal contractor installs an aggregate processing facility at Cal-Am's sediment disposal site, processes the sediment as it arrives to the disposal site, disposes of the waste by-product at the disposal site, and stockpiles the processed aggregate for future sale by Cal-Am or a licensee.** Under this scenario, Cal-Am would incur the initial cost of processing the 3 million tons of sediment. We believe that the incremental cost to Cal-Am of processing the sediment would be on the order of $3 to $4 per ton, so Cal-Am's initial investment may be on the order of $10 million. We have assumed that Cal-Am would then sell about 2 million tons of aggregate over a period of about 10 years, i.e., at a rate of about 200,000 tons per year. Because of the relatively large distance of this area with respect to major demand centers (Monterey and Salinas areas) and associated haul costs, it is unlikely that the aggregate products could command prices higher than $8 to $10 per ton, i.e., on the order of $1.6 million to $2 million per year. (Note that in June 2004, Graniterock estimated that the price of concrete sand at an on-site location close to Carmel Valley Road would have to range from about $1.50 per ton to $7.40 per ton to compete with closer sources, see Attachment 2). To sell the sediment, Cal-Am or its licensee would need to set up a site facility, including an office, scales, and earth-moving equipment to load third-party trucks. It is anticipated that a staff of at least three full-time personnel would be needed to cover (1) management, marketing and sales, (2) facility operation, and (3) dispatching and administration. Cal-Am's operating expenses would include but not be limited to labor costs; lease costs for the scales, loader, and office trailer; utilities; commercial license fees; site maintenance and restoration; environmental monitoring and mitigation; and legal and administration costs related to community concerns. While we have not prepared a detailed estimation, we anticipate that operating expenses could easily run on the order of $500,000 per year. The

maximum operating income might thus be in the range of $1 to $1.5 million per year over 10 years.

This approach carries risks for Cal-Am, including but not limited to production risk (that the yield of marketable aggregate will decrease because of either quality or grain-size considerations), market risk (that the assumed demand for aggregate will either not materialize or will materialize at a lower price), and operating risks (due to numerous factors including, for instance, the potential for legal challenges arising from community opposition to an industrial-type operation in their backyards). The rate of return on Cal-Am's investment that is implicit in the stream of cash flows described above is in the range of 0% to perhaps 8%, far lower than the cost of capital. Therefore, we conclude that this approach does not present value for Cal-Am at this time.

Conclusion

An approach for cost effective development of mineral resources in the sediment now stored in San Clemente Reservoir does not appear to exist at this time. While the sediment could be processed into products that have commercial value, this value is significantly and completely offset by the incremental processing and transportation costs involved. Therefore, it is concluded that there is not a positive benefit-cost ratio for selling the sediment based on current market conditions.

Attachments:

1. Letter from Mr. M. Munn, Graniterock, to Mr. Don Crone, MWH, dated January 7, 2005.
2. Letter from Mr. M. Munn, Graniterock to Mr. Fred Feizollahi, California American Water, dated June 10, 2004.

ATTACHMENT 1

Graniterock.

January 7, 2005

Dan Crone
M. W. H.
Re: San Clemente Dam

Dear Mr. Crone:

Thank you for the opportunity to consider the 2 million tons of sand and gravel from the San Clemente Dam. Upon further evaluation, the material has no value to us for reprocessing into concrete sand, pea gravel, and drainrock unless the material can be screened on site. Freight costs negatively impact the economics of moving material to our processing plant in Hollister.

We would consider the material at $0.50/ton if a screening plant could be brought on site at the stockpile location and if we were allowed to run the plant roughly 12 hours per day, five days per week, over a 10 year period. There is a possibility we would not need the full 10 years, but we cannot be certain based on current market conditions.

Sincerely,

Michael D. Munn
Sales Manager
Aggregate Division
Graniterock

- Monterey County
- San Benito County
- San Mateo County
- Santa Clara County
- Santa Cruz County
- City and County of San Francisco

Material Supplier/Engineering Contractor
License #22

P.O. Box 50001 Watsonville, CA 95077-5001 (831) 768-2000 Fax: (831) 768-2201
www.graniterock.com

ATTACHMENT 2

Graniterock.

RECEIVED
JUN 14 2004
CAL-AM WATER CO.

June 10, 2004

Mr. Fred Feizollahi, P.E.
Sr. Operations Manager
California American Water
P.O. Box 951
Monterey, CA 93942

Re: San Clemente Reservoir Sand

National Quality Award 1992 Winner

Dear Mr. Feizollahi:

California American Water has asked Graniterock, as a courtesy, to provide preliminary information regarding the potential retail market value of the sand deposit that has accumulated behind the San Clemente Reservoir on the Carmel River. We understand that you are not requesting a formal appraisal or opinion of value, but rather our informal thoughts on the value of the sand in today's construction market.

Based on the drilling logs provided by Cal Am and two "grab" samples we took during a site visit in May of 2004, the sand deposit would likely be suitable for use as concrete or plaster sand. More tests would be necessary to confirm this to the satisfaction of a potential buyer, but initial indications based on the samples tested appear promising.

With aggregate products, one of the biggest factors affecting market price is the haul distance from the point of origin to the point of use. Freight costs are often greater than the cost of material shipped. Our market analysis assumes the sand would be mined from the reservoir and stockpiled at a location close to Carmel Valley Road. We used the location adjacent to the Cal Am filer plant site to conduct our analysis of freight costs, and have assumed that all shipping would be from that site to U.S. 101 through Greenfield, rather than to Highway 1 through Carmel Valley Village. The feasible market area for the sand includes the Monterey Bay and southern Santa Clara County markets. There are numerous ready-mix concrete manufacturers in that market area with a demand for concrete sand.

Concrete sand in the potential market area from closer sources (e.g. from the sand quarry located in San Juan Bautista) is currently priced at a *delivered* price of $13.00 to $17.00 per ton, depending on the length of haul. We estimated a shipping cost of between $6.00 to nearly $16.00 per ton for various customer locations within that market area for the San Clemente sand. Depending on the landed location for the San Clemente sand, the price of the sand would have to range from about $1.50 per ton to $7.40 per ton to compete with closer sources. We think a median price for the sand would be approximately $3.00 per ton.

Assuming that there are 2 million tons of usable sand in the reservoir, the revenue from the sale of sand from a stockpile located at the filter plant to concrete manufactures in today's market would by roughly $6 million (2 million tons x $3.00 per ton).

These are our preliminary thoughts on the market value of the sand. Of course, if Cal Am or anyone else needs more definitive information on which to base a decision regarding the sand, please let us know and we can discuss the steps required for a more definitive analysis.

Very truly yours,

GRANITE ROCK COMPANY

Cc: Joyce Ambrosius

Appendix J

SEDIMENT OPERATION AND MANAGEMENT PLAN FOR FISH PASSAGE

Final EIR/EIS

For the

San Clemente Dam
Seismic Retrofit Project

SEDIMENT OPERATION AND MANAGEMENT PLAN FOR FISH PASSAGE

Prepared for

California Department of Water Resources
United States Army Corps of Engineers

Prepared by

ENTRIX Inc.

January 2008

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1.0 INTRODUCTION

1.1 BACKGROUND FOR THE SEDIMENT OPERATION AND MANAGEMENT PLAN (SOMP) FOR FISH PASSAGE

San Clemente Dam (SCD) was constructed in 1920-1921 as a diversion point for water supply. SCD originally impounded approximately 1,425 AF of water at a spillway elevation of 525 feet. Over an 86-year period of operation, the dam has trapped an estimated volume of 2.5 million cubic yards (1,555 acre-feet [AF]) of sediment generated in the upstream watershed. From the spillway elevation of 525 feet there currently remains approximately 100 AF of reservoir storage capacity.

Average natural background sediment inflow to the reservoir amounts to about 16.5 acre-feet per year, 80 percent of which is delivered by the Carmel River and the remaining 20 percent by San Clemente Creek. At this background rate of sediment inflow, it is anticipated that the remaining 100 acre feet would fill with sediment in about six to ten years.

Accumulated sediment in the Carmel River arm is at the upstream face of SCD at an elevation of about 515 AF, ten feet below the spillway elevation (see EIR/EIS Section 4.2.1 for detailed evaluation). The accumulated sediment is distributed from the east abutment to the west side of the spillway. Sediment from the Carmel River has also begun to fill the San Clemente Creek arm of the reservoir. At full reservoir pool (water surface elevation of 525), the sediment/water interface is located about 200 feet upstream of the dam in the Carmel River arm. A low flow channel has developed through the delta of stored sediment in both arms, progressing downstream to the reservoir pool.

As described in Section 4.2.3 (Issue WR-5), during low-flow periods, when all of the river flow is going through the fish ladder, the slope of the water surface of the channel leading into the remnant pool is steep and has a high sediment transport capacity. This sediment can build up in a wedge in the remnant pool that would approach the fish ladder exit. Fine sediment would be conveyed toward and through the fish ladder. Any alternative that leaves SCD in place would require construction of a new fish ladder and a way to assure fish passage upstream through the remaining reservoir to the Carmel River and San Clemente Creek.

1.2 PURPOSE OF THE SOMP

The purpose of the Sediment Operation and Management Plan for Fish Passage (SOMP) is to provide a flexible suite of management tools that can be used proactively to maintain fish passage through the fish ladder and upstream of SCD. It includes these objectives:

- Address the potential actions necessary to maintain up and downstream passage for steelhead (*Oncorhynchus mykiss*) between the top of the fish ladder and the upstream channel.

- Manage sediment conditions upstream of SCD between the upstream exit of the fish ladder and the upstream river channels to allow continuous passage for steelhead.

- Focus on measures that can be implemented proactively during the dry season (June-October), to prevent fish passage problems from developing in the subsequent wet season (November through May) and forestall the need for wet-season sediment management.

- Provide for adaptive management and ongoing improvement of the SOMP based on monitoring information.

- Emphasize consultation and coordination with resource agencies in determining actions and methods to implement in order to provide sediment management for fish passage.

2.0 SEDIMENT OPERATION AND MANAGEMENT PLAN FOR FISH PASSAGE

This SOMP provides a toolbox of actions that can be implemented to manage sediment accumulation behind SCD to maintain fish passage during the adult upstream migration season (January through May). Physical sediment management methods include sluicing sediment through the dam or excavating sediment using mechanical means or a suction dredge.

The SOMP uses a collaborative adaptive management approach that emphasizes consultation with resource agencies to choose and implement appropriate actions before the migration season begins, rather than waiting to respond to problems after they have occurred. The SOMP would be modified and improved based on information gathered during each year of sediment management.

Implementation of the SOMP would integrate new monitoring data, collected after implementation of the project and after each sediment management activity, with historic physical and fish migration as a basis for sediment management decision-making.

Because the SOMP implements a proactive, adaptive approach, it does not specify sediment control procedures in advance but retains the flexibility that would allow collaboration to choose actions (if any) and methods to manage sediment and ensure fish passage through the ladder and reservoir. The decision-making process would be based on immediate fish passage needs, data collected from previous management actions, fish migration resources, and time of the year.

2.1 MANAGEMENT SEASONS

The SOMP defines two management action windows: (1) June through October would be the dry season window and (2) November through May would be the wet season window. To ensure fish passage during the wet season, the dry season window focuses on managing sediment upstream of SCD prior to any fish migration. Dry season management activities are done while the Carmel River flow is near base flow levels, a time when the mouth of the Carmel River is typically blocked and anadromous fish are unable to enter the Carmel River from the ocean. Dry season actions are intended to establish conditions from the fish ladder upstream that will allow for fish passage throughout the upcoming migration season based on the anticipated sediment loading to the reservoir. The objective of the dry season actions is to establish conditions that will provide fish passage and not require any additional action during the wet season.

The wet season management period would focus on maintaining an open channel during the migratory season when flows are high enough to accommodate fish passage through the ladder. The two windows are differentiated by the presence of steelhead trout and the typical seasonal flow regimes of the Carmel River.

2.1.1 DRY SEASON SEDIMENT MANAGEMENT ACTIONS

- The dry season is generally the low-flow season for Carmel River and therefore would be the designated sediment management window for implementing such proactive management measures as dredging. During the dry season window (June through October), average daily flows have historically ranged from no flow (0 cfs) up to 130 cfs (based on the 48 years of recorded flows at USGS Robles Del Rio gauge).

- Because some of the management actions in the SOMP rely on low flow conditions, the historic flow record was analyzed to assess the frequency of low flow conditions in the dry season. Daily flows from the historic record were ranked and an exceedance graph was developed to estimate the probably of low flows during the months of the dry season. A flow of 20 cfs would be the upper limit for safely working in the channel upstream of the SCD during sediment management activities, based on engineering judgment regarding the magnitude of flow that would be contained in the low flow channel upstream of the dam. Figure J-1 presents an exceedance graph of the average daily flow for the Carmel River at the Robles Del Rio gage, located downstream of SCD. The exceedance graph shows the percent of time a given flow is exceeded during the dry season and could interrupt sediment management activities. The analysis of daily flow data show that a flow of 20 cfs is exceeded:

- 39 percent of the days in June;

- 12 percent of the days in July;

- 5 percent of the days in August;

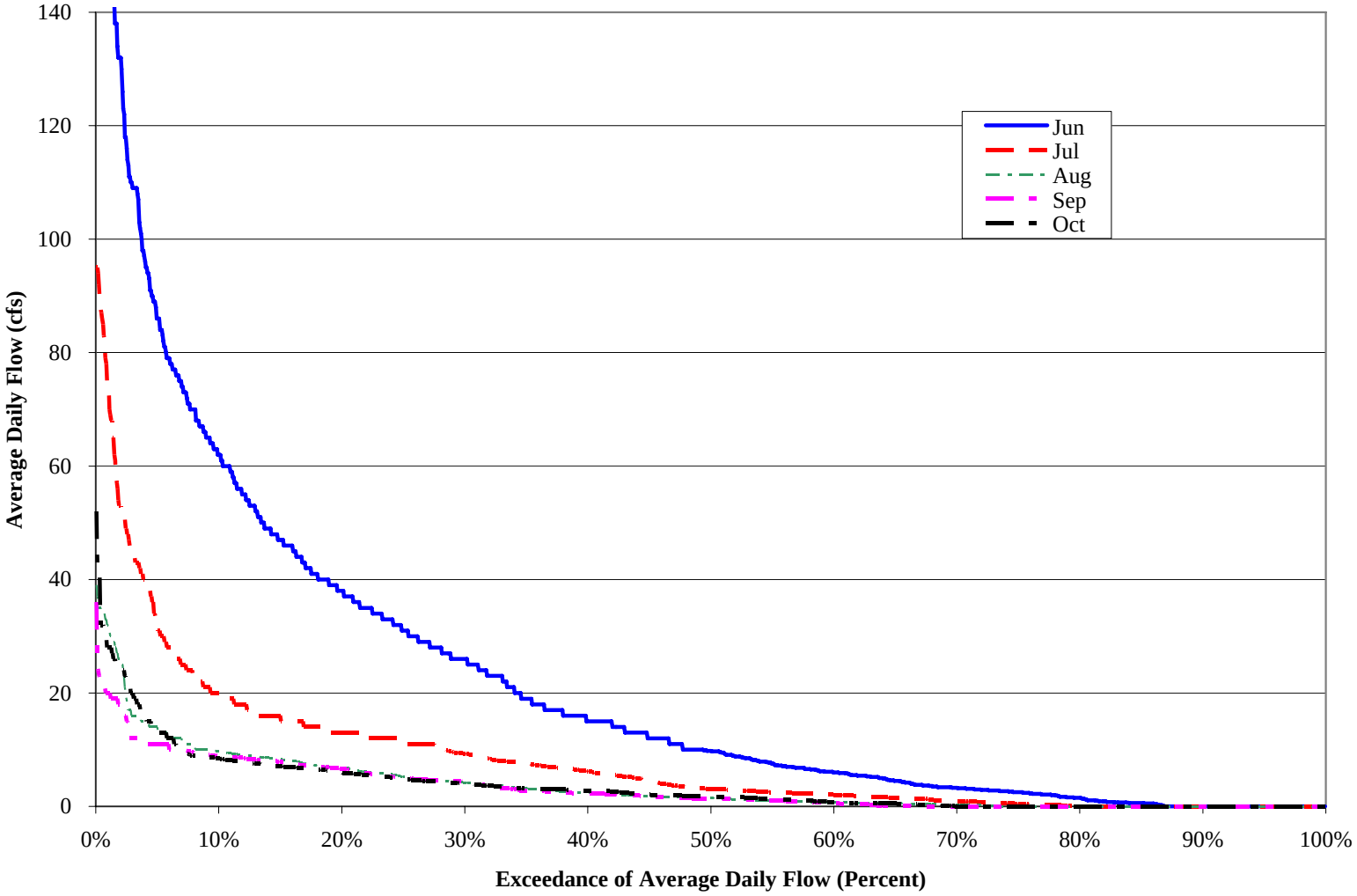
- 2 percent of the days in September; and

- 4 percent of the days in October.

These probabilities indicate that as the dry season moves further into the summer and fall months, high flows would be less likely to constrain sediment management activities behind the dam.

The dry season is further subdivided into a data collection period (June through August) and an implementation period (August through October). During the data collection period, the condition of the remnant pool, and the Carmel River and San Clemente Creek channels would be examined and fish migration data from the previous wet season would be analyzed (see SOMP Section 3.0 for further discussion of data collection). Proactive sediment management actions would be undertaken during the implementation period as discussed below. This period would comprise those months in which flows are typically lowest (Figure J-1).

Figure J-1: Exceedance of Average Daily Flow for the Sediment Maintenance Actions



Source: Data from Carmel River at Robles Del Rio (#11143200), water years 1958-2006.

2.1.2 WET SEASON FISH PASSAGE MANAGEMENT ACTIONS

Significant wet season changes in sediment conditions upstream of the dam may require implementation of wet season management. Fish passage conditions would be visually monitored during the primary fish migration period (January through May) to assess fish passage conditions. If it appears that passage may become impeded, wet-season sediment management actions would be considered, following the process described in Section 3 below.

2.2 SEDIMENT MANAGEMENT TOOLBOX

The sediment management toolbox is a resource that provides management tools to respond to sediment conditions upstream of SCD. The selection of management tools would be based on recent monitoring data regarding biological and physical conditions. Different tools may be appropriate for use depending upon the time of year (dry season versus wet season) and the type of action that is needed. These tools are explained below.

2.2.1 DRY SEASON SEDIMENT MANAGEMENT TOOLS

Under the SOMP, sediment management work is preferred to be undertaken during the dry season, when the chance of fish exposure or water quality problems is low. During the dry season, sediment buildup in the remnant pool could be addressed through maintenance tools such as:

- Mechanical dredging
- Suction dredging
- Operation of the fish ladder

A description of each sediment management tool is described below. In addition, suggested parameters and justification is also provided.

Mechanical Dredging

Mechanical dredging uses machinery to physically remove and dispose of sediment stored within the impoundment. Dredging would be accomplished with such machinery as an excavator and a dump truck to collect and haul away the sediment. Mechanical dredging is currently employed about every two to four years at Daguerre Point Dam to maintain upstream passage between a fish ladder and the river. Similar removal methods would be considered for sediment management at SCD, and would likely be employed at a similar frequency.

Suction Dredging

Suction dredging uses a vacuum to pick up a slurry mix of water and sediment. The slurry would be piped directly to a dewatering site where it would be dried and loaded

into trucks to haul to a disposal site. Dewatering can be handled onsite within the reservoir area by dumping the slurry mix in a bermed area on the existing stored sediment. (Similar dewatering areas are evaluated in the EIR/EIS in relation to sediment disposal under Alternatives 1 and 2). A dry, elevated area above the low-flow channel would be used. An off-site sediment disposal location (Site 4R) has been identified and evaluated in the EIR/EIS. The amount of sediment requiring disposal on an annual basis under the SOMP would be far less than that considered for disposal at Site 4R under Alternatives 1 or 2.

Dried sediment can also be stockpiled for later addition to the river. Stockpiles could be strategically placed so as to add sediment to a flood flow for downstream conveyance, or at locations that would not be influenced by flow. This type of storage can also be used with graded sediment so as to introduce specific sediment sizes to the river.

Suction dredging would occur only if flows are low and there is no woody debris present. The fish ladder would have to be closed during this time to keep fish away from the work area. Temporary barriers also would be placed near the dredging to keep fish from the entering the work area. This technique may be appropriate to clear the fish ladder, which will pass fine sediment when open. Suction dredging would remove fine sediment that has been deposited in or suspended in front of the fish ladder.

Operation of the Fish Ladder

Sediment modeling (MEI 2007) suggests that maintaining a consistent water surface elevation (e.g., the spillway level) and avoiding rapid drawdown of the water surface could avoid the problem of a sediment wedge moving into the remnant pool and entering the fish ladder. Maintaining the spillway as the control point could be accomplished by reducing flow through the ladder and raising the water surface elevation in the remnant pool to an elevation of 525 feet. If the water surface must be brought down to an elevation below the spillway, excess sediment would be removed using dredging before the drawdown.

2.2.2 WET SEASON SEDIMENT MANAGEMENT TOOLS

The wet season includes two distinct periods: During the first period, from November to January, fish have not yet begun to migrate and the mouth of the Carmel River at the lagoon is typically closed from the ocean by a barrier beach. The second period begins once the mouth of the river is open and higher flows initiate fish migration, typically from January to May. The management tools available for the wet season include:

- Sluicing through sluice gate
- Suction dredging
- Sluicing through the fish ladder
- Trap and truck fish

A description of each sediment management tool is described below. In addition, suggested parameters and justification is also provided.

Sluicing Through the Sluice Gate

Sluicing refers to the evacuation of water and sediment from an impoundment through an orifice in a dam. Sluicing is a long-established means of releasing sediment from the reservoir. This wet season sediment management tool would be used only if fish passage conditions deteriorate, based on monitoring information. Dry season sediment management would be used to establish adequate fish passage entering the wet season, and normally should be sufficient to maintain fish passage throughout the wet season.

Sluicing would be accomplished using a 10 foot diameter circular gate constructed in SCD east of the fish ladder (Figure J-2). The gate can be opened to pass water and sediment. Sluicing can also occur through the fish ladder, which is designed to pass both water and sediment.

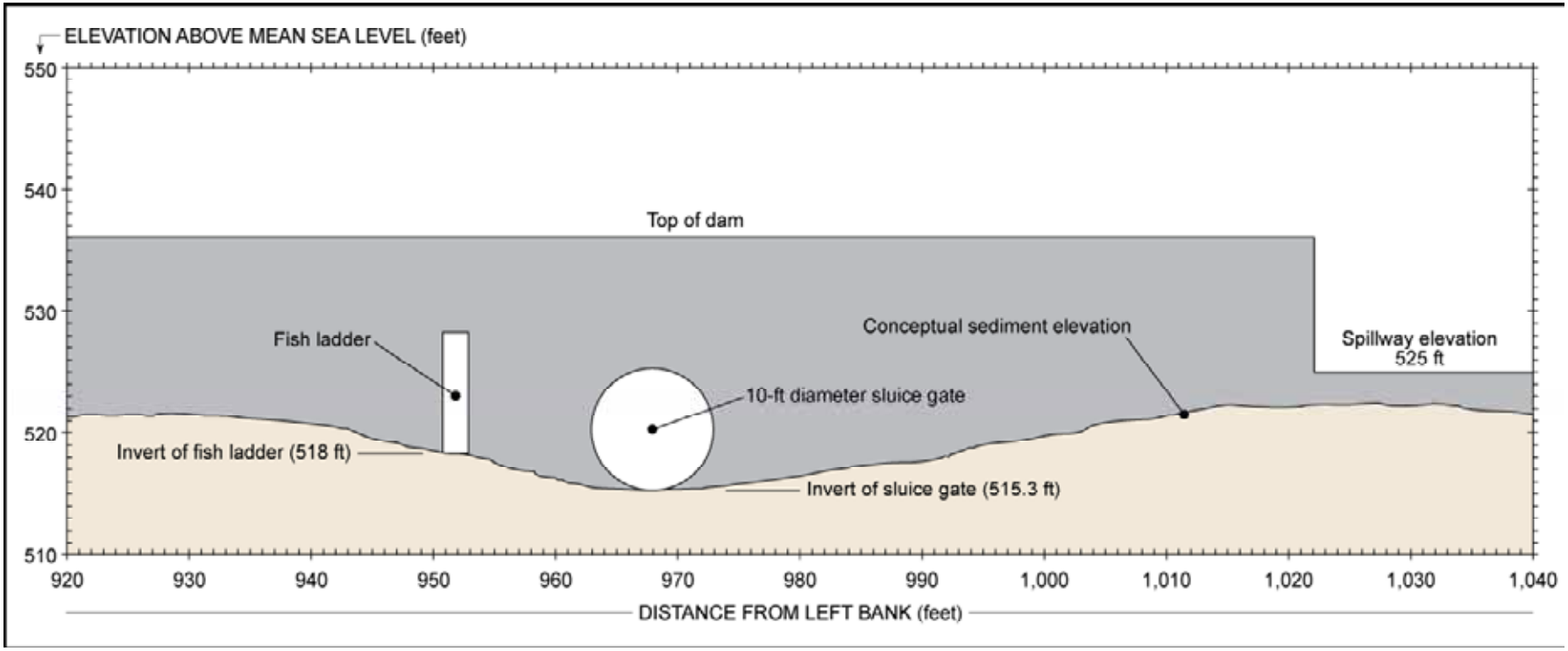
Sluicing was assessed using sediment transport modeling and available flow data described in this EIR/EIS. The SOMP identifies criteria to determine whether sluicing would be needed and whether appropriate conditions exist to consider undertaking a sluice event; it does not predetermine the use of sluicing as a sediment management tool.

Potential Sluicing Events

Prerequisites to sluicing include high flow coupled with the presence of sediment near the fish ladder that may block the ladder. Flows sufficient to carry sediment through the sluice gate typically occur during the wet season. The SOMP requires a threshold flow of 300 cfs to initiate sluicing.

To estimate the frequency and duration of potential sluicing events, historic records of average daily flows at the Carmel River at Robles Del Rio gage were analyzed. Flow data are available for this gage from October 1957 to 2006 (49 years of recorded daily flows). Data from the Robles Del Rio gage was used rather than data from the Sleepy Hollow Gage because the Robles Del Rio record is longer, is in a ready-to-use electronic format, and is more reliable. The Sleepy Hollow gage uses flow over the SCD spillway to estimate high flows. This estimation is unreliable whenever debris is present in the spillway. A comparison of the flows at both gages for water year 2005, where reliable data are available from January to July, shows a similar flow pattern. Therefore, the Robles Del Rio gage data is considered sufficient for this analysis.

Figure J-2: Sluice Gate and Fish Ladder Configuration



Adapted from MEI 2006

A spreadsheet model was developed to determine the number of potential sluicing opportunities per year, the length of an event, and the length of time between events. Potential sluicing events were defined as periods when the two-day average of daily flow falls within a range of 300-800 cfs. This range was selected based on MEI (2006), which modeled possible sluice events. The frequency and duration of possible sluicing events varies with the magnitude and duration of flow. MEI (2007) found that sluicing could remove the necessary amount of sediment at flows around 300 cfs with the sluice gate open for approximately 2 hours.

Analyses conducted using this spreadsheet model determined the number of events in a year when flows would be within the appropriate range for sluicing, and also the number of events falling in this range on the rising limb of the hydrograph. (Sluicing would be preferred to occur on the rising limb of the hydrograph because sediment transport capacity increases with flow. Sluicing at this time would improve downstream sediment transport and avoid unwanted sediment storage in the plunge pool.)

While these analyses yield an estimate of the number of potential opportunities for sluicing (as discussed further below), they do not address the issue of whether sluicing is necessary nor do they designate the preferred method to control any unforeseen buildup of sediment prior to sluicing. Actual operations and sediment management under this SOMP would depend upon several factors (as discussed in Section 3 below). Evaluation of these factors could lead to a determination that sluicing is not necessary, that the pre-season sediment management was sufficient to assure fish passage, or that the real-time hydrograph indicates the need to follow a different sluicing pattern then the one described here based on average daily flows.

Estimated Sluicing Opportunities for the Entire Hydrograph

Analysis of the 49-year record for potential sluicing opportunities throughout the rising and falling limbs of the hydrograph shows that 42 years of the 49-record, at least one sluicing opportunity was available; the years in which no sluicing opportunities occurred were seven of the eight driest years in the record.

Although few or no sluicing opportunities may occur during low flow years, sediment transport capacity also would be low and sediment deposition in the remnant pool and upstream channels would be minimal during these years. This suggests that fish passage during these times would be unlikely to present a problem. If a sluicing event were to be necessary in a dry year, the sluiced sediment would be deposited into the plunge pool and the upper reach (Reach 4.3) of the river, with little or no transport to the downstream portion of the river until higher flows returned in subsequent years.

On average, 20 sluicing opportunities occur in any given year. The duration of periods during which optimal flows are available for sluicing greatly exceeds the amount of time needed to sluice. Although the sluice gate may need to be opened for only two hours in order to evacuate the accumulated sediment, the duration of optimum flows averages five days, and periods of optimum flow range up to 56 days.

Estimated Sluicing Opportunities for the Rising Limb of the Hydrograph

Based on the results of the spreadsheet model and assuming that sluicing would be performed only on the rising limb of the hydrograph, at least one sluicing opportunity would occur in 86 percent of the years; 14 percent of the years would present no sluicing opportunities.

The total number of annual sluicing opportunities decreases if only the rising limb is used. There is an average of five opportunities per year when sluicing is constrained to the rising limb, as opposed to 19 when the entire hydrograph is considered. The average length of time when sluicing flows are optimal would be one day, with the duration of optimal sluicing flows ranging from one to three days.

Sluicing Modeling

MEI (2007) found that sediment may fill the channel upstream of the SCD and excess sediment may be conveyed into the fish ladder during the dry season, when flows drop below the capacity of the fish ladder. Whenever flows exceed the fish ladder capacity, water flows both through the ladder and over the spillway, and the spillway elevation controls the water surface elevation in the remnant pool. When flow drops below the fish ladder capacity, all the water goes through the fish ladder, the fish ladder controls the water surface elevation, and the surface water slope through the channel leading to the remnant pool increases. These factors increase sediment transport capacity, and would cause fine-grained material to refill the sluiced channel and to be transported into and through the fish ladder.

MEI found that this condition could be managed by controlling the flow through the ladder. By restricting the fish ladder opening, the surface elevation of the pool upstream of the dam could be maintained at the spillway elevation, causing fine sediment to deposit near the upstream end of the pool.

Sluicing Through the Fish Ladder

The fish ladder is designed to pass both flow and fine sediment. When open, suspended sediment and sediment that settled directly upstream of the ladder would be transported into the ladder and downstream. The fish ladder would be able to convey fine sediment (sand, silt, and clay) but may not be able to convey gravel. If coarse sediment (gravel sized and larger) were to build up, other tools such as mechanical dredging would be used to clear the sediment before opening the fish ladder.

Trap and Truck Fish

Trapping and trucking fish is not a sediment management tool, but can be used when other SOMP actions require a short-term closure of the fish ladder. The process involves collecting fish from the ladder and moving the fish upstream above the dam and fish ladder. This action would be needed if the fish ladder were closed during the migration period for any reason. For example, if sediment deposited in front of the

ladder following a large flood and suction dredging was to be employed to remove it, the ladder would be closed during the operation to avoid impacting fish. (If no fish were present in the ladder, then trapping and trucking would be unnecessary.)

3.0 SEDIMENT MANAGEMENT DECISION PROCESS

The SOMP guides a process of annual data collection and evaluation during the low-flow period from June through October to proactively determine the need for sediment management actions to prepare the Carmel River and San Clemente stream channels upstream of SCD for the upcoming wet season and to maintain suitable conditions throughout the year.

3.1 DRY SEASON CONDITIONS

A decision tree for the selection of dry season sediment actions is shown in Figure J-3. Decisions are based on annual data collected to monitor changes in sediment deposition within the reservoir and fish ladder. The goal of sediment management is to maintain the Carmel River and San Clemente Creek channels flowing into the remnant pool following sediment inflow during the previous wet season.

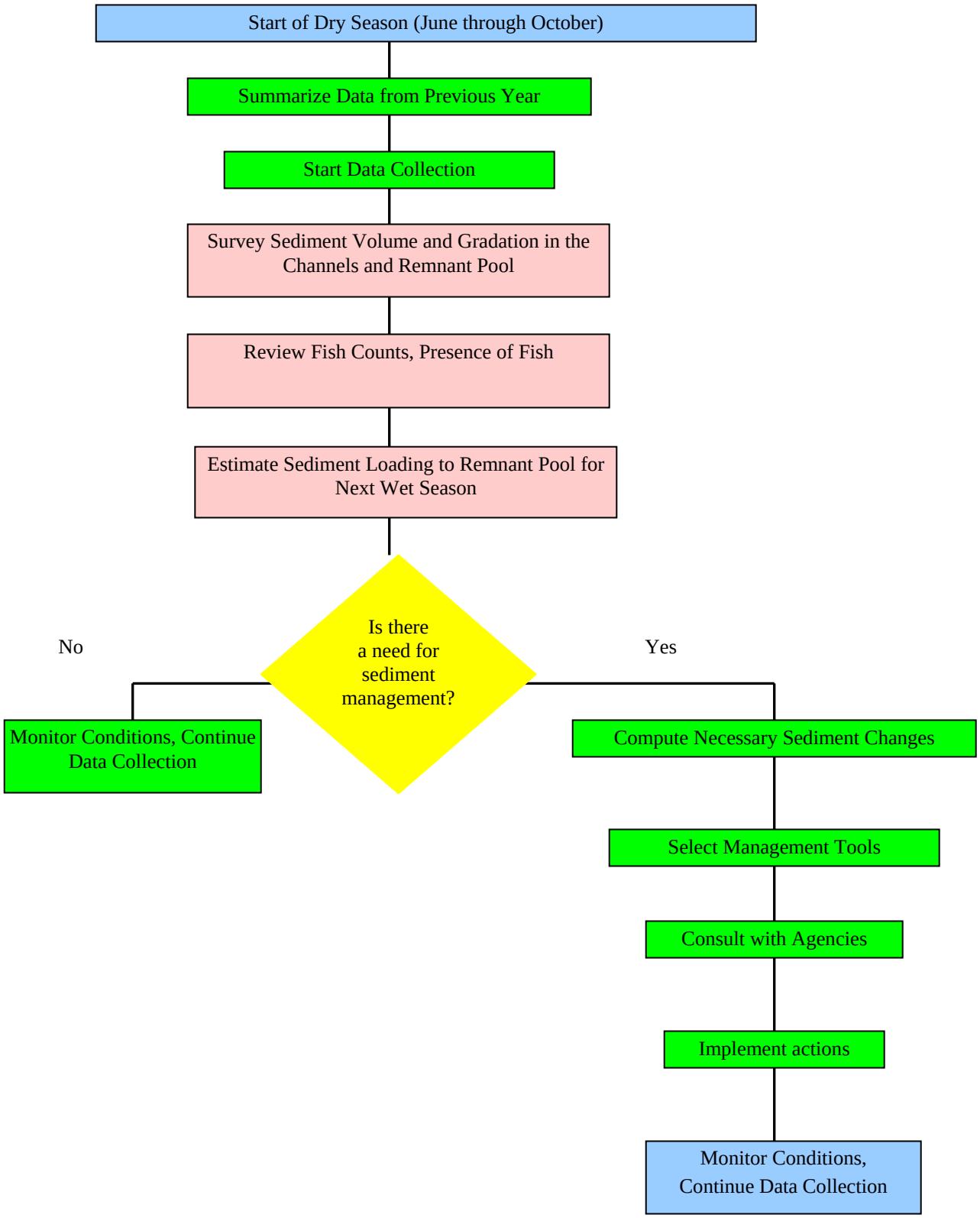
3.1.1 DATA COLLECTION

Data collection and monitoring are important components of the SMOP, and includes both physical and biological data sets. Physical data include sediment volume in the remnant reservoir, sediment passing the dam, and suspended sediment concentration. Biological data include the presence of fish in the ladder and remnant pool, numbers of fish using the ladder, and spawning utilization of the lower river.

Data collection serves two purposes: it provides a measure of current conditions and it adds to a long-term database that allows comparison of data across years to assess trends.

CAW (otherwise referred to as “applicant” on future actions relating to this project) would be responsible for the collection and analysis of data. These data would be integrated with data collected by other agencies to create a large database of information to use in the decision-making process.

Figure J-3: Schematic Representation of the Dry Season Sediment Management Actions



Adult Fish Passage Conditions

An automated fish counter would be installed in the fish ladder to record the number of fish passing each day throughout the migration season. The counter would be operated throughout the year to collect data on out-migrant smolts or residents. A counter such as the Vaki River Watcher (VRW) system would be used. The VRW is capable of counting fish, measuring body size, and determining direction of travel. These data would be used to document fish passage conditions at SCD and would augment the long-term record of fish passage at SCD.

The Monterey Peninsula Water Management District (MPWMD) monitors annual juvenile steelhead abundance monitoring at sites throughout the Carmel River. Juvenile abundance surveys may be supplemented in the area immediately downstream of SCD to document the population's response to changes in bedload and suspended sediment conditions.

Biological Conditions

Periodic studies would be implemented through CAW ("applicant") in selected reaches of the Carmel River to evaluate changes to the macroinvertebrate fauna. Such studies would be conducted biannually for the first several years and the results would be assessed to determine the frequency with which studies would be implemented going forward. Study reaches would include reaches immediately above and below SCD, as well as control reaches located upstream of any influence of the project. These reaches would be monitored to evaluate changes to aquatic invertebrates as a result in the change in sediment delivery to the river.

Water Quality Conditions

Water quality parameters (turbidity, dissolved oxygen, and temperature) would be monitored at established sites at locations throughout the river, beginning upstream of SCD and including the remnant pool, the channel formed through the sediment in the reservoir, the natural channel upstream of the reservoir, and locations from the dam to the mouth of the Carmel River. These data would document any changes that may occur throughout the year and following sediment management activities. Initial sampling would identify seasonal changes resulting from channel construction activities, and would continue at regular intervals throughout the year.

Sediment Inflow and Outflow

Sediment conditions in the remnant reservoir and at SCD would be monitored visually, and measured at established sampling locations. During the dry season data collection, the "applicant" would establish control points in the remnant pool and stream channels for long-term comparisons of sediment elevation and gradation. The collected data would include surveyed sediment elevation, sediment gradation, a water surface profile of the channels, and flow.

Changes in the volume of stored sediment would be estimated through channel and floodplain cross-sectional surveys. Comparisons between dry and wet season sediment volumes in the impoundment would be used to estimate the net change in stored sediment.

Flow and the fish count information would be used to related fish passage to flows during migration and to sediment conditions at the start of the wet season. These data would be used to help identify physical conditions needed to pass fish and how those conditions change from the start to end of the wet season for different water year types.

Channel Hydraulics Upstream of Dam

Channel cross sections would be surveyed at specified locations during the pre-season to estimate the hydraulic characteristics of the Carmel River and San Clemente Creek channels above SCD. Based on these hydraulic characteristics, a sediment transport relationship would be developed, closely approximating the measured sediment data. The MEI sediment model (see Appendix S) would be used to project wet season sediment flow and select sediment management actions to be implemented prior to the beginning of the upcoming wet season.

3.1.2 DATA ANALYSIS

Existing physical and biological data would be used to establish pre-project conditions and a baseline for initiating the SOMP. At project completion, physical data would be gathered on the sediment volume, channel characteristics (width, depth) upstream, and gradation upstream of the reservoir. Modeling results (MEI 2005, 2006, 2007) would be used to provide estimates of channel conditions and sediment transport and deposition in the reservoir. These data establish baseline physical and biological conditions in the river and allow CAW to project the anticipated sediment deposition in the remnant pool for the upcoming wet season.

Sediment will be removed from in front of SDC to facilitate dam thickening or dam notching. Final configurations of the remnant pool and the Carmel River and San Clemente Creek channels leading to the pool will be designed. These designs would accommodate anticipated sediment loads during the wet season and constitute the post-project initial condition.

During the first year, baseline data would be compared to sediment deposition data collected during the first dry season after project completion, to ascertain whether deposition is within the anticipated post-project condition or if excessive deposition has occurred. If this review determines sediment deposition in the remnant pool is within expected limits, then management activities would be selected to clear any newly deposited sediment prior to the start of the wet season. CAW would be responsible for their implementation. If more sediment is deposited than was anticipated following the first year of implementation, sediment management actions would be selected and implemented, and estimates of long-term sediment relationships would be adjusted to

improve the ability to predict sediment loading in the future. If the channels and remnant pool are at or near the planned baseline, no maintenance or management activities would be required.

In subsequent years, the baseline database would be adjusted annually to reflect changes in stored sediment relative to the constructed channel and remnant pool. Each year, these data would be reviewed to determine actions needed to prepare the channel for the wet reason. Baseline conditions may vary from year to year, and the annually expanding database will assist in future projections of wet season conditions.

3.1.3 SEDIMENT MANAGEMENT IMPLEMENTATION

If sediment management activities are deemed necessary, they would be conducted during the low-flow period to minimize turbidity effects to fish. Low flows typically occur outside of the adult fish migration period. The objective of sediment management is to assure that the channels from both watercourses into the remnant pool are clear and have the appropriate cross-section to provide the necessary passage depth. The physical parameters for channels and the remnant pool would be established in the initial project design, but may be modified as more data are collected. In general, stream channel parameters are based on fish passage criteria for steelhead (depth and velocity), together with a goal of assuring that the remnant pool retains about 2 acre-feet of water storage capacity.

The appropriate method to restore initial post-project conditions depends on the location of the maintenance work, the amount of sediment to be removed, and the current flow conditions. The objective would be to select tools that minimize disturbance to fish and which do not adversely influence water quality.

Implementation of appropriate sediment management actions under the SOMP would establish suitable conditions for fish passage before the wet season. As more data are collected for maintenance activities, sediment projections are expected to improve allowing dry season actions to be fine-tuned.

During the first years of sediment management, moderate flow events (1.5 to 5-year recurrence interval flow) would need to be closely monitored. These moderate flow events are able to transport material downstream, but may not initiate large flows over the spillway. As a result, the amount of scour and bed mobilization immediately behind SCD under such flows would be small, allowing sediment to enter the remnant pool, possibly impeding fish passage upstream. As additional data are collected on the amount of sediment transport and deposition that occurs behind the dam during moderate flow events, managers may determine that sediment excavation may be needed.

3.2 WET SEASON CONDITIONS

During the wet season, the goal of the SOMP is to maintain conditions established during the dry season that allow fish passage past SCD and through the impoundment. At the completion of the project, a design for the upstream channels and the remnant pool at the dam would be implemented to provide fish passage under the anticipated annual sediment load. The implementation of this design going into the first wet season following completion of the constructed channels would allow fish passage throughout the wet season with the anticipated volume of inflowing sediment. Real-time monitoring of the fish passage conditions would be undertaken to ensure fish passage conditions are maintained. A decision tree for wet season conditions is provided (Figure J-4).

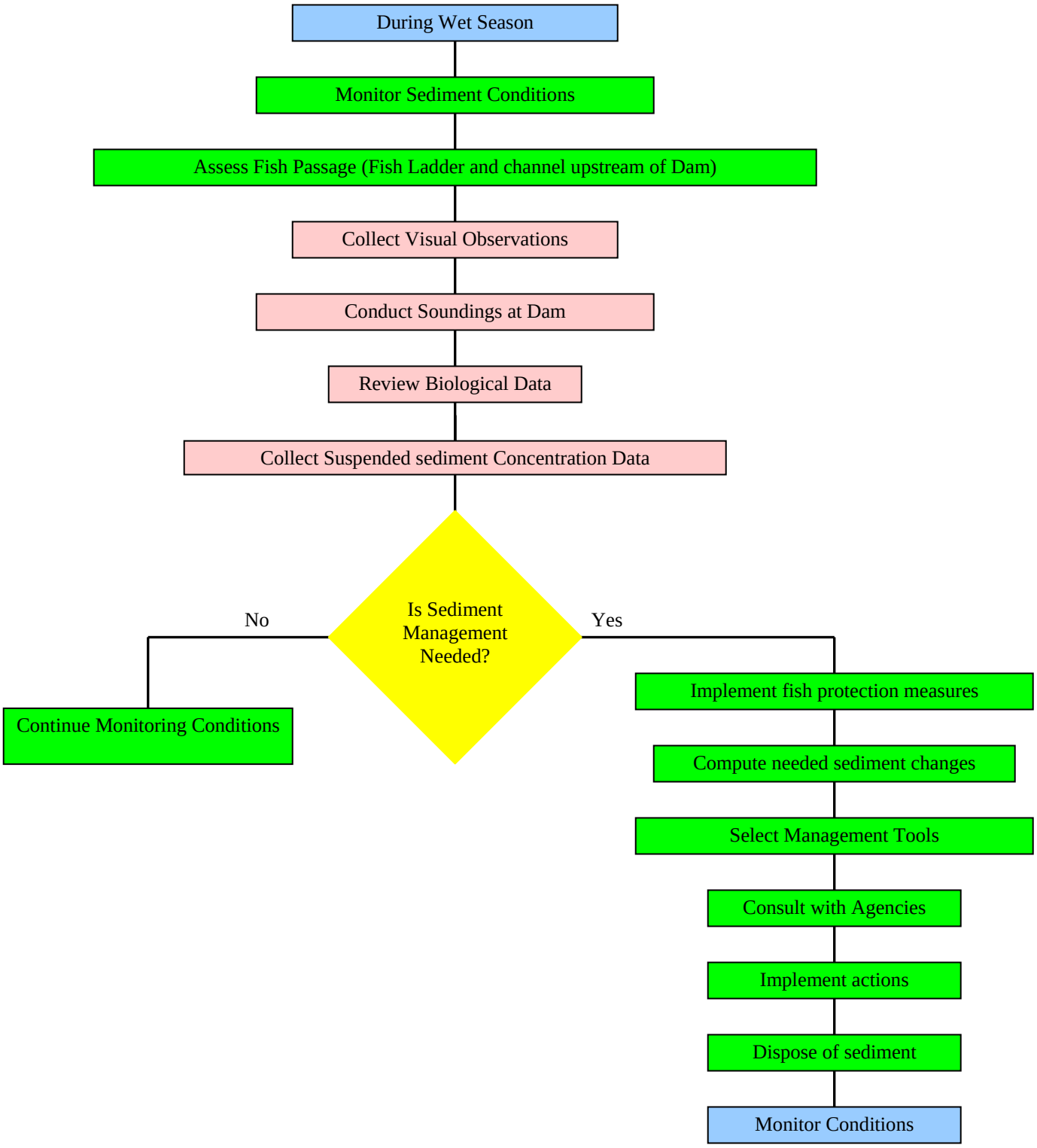
Wet season real-time monitoring would assess the sediment buildup upstream of the dam. During high flows, it is difficult to safely survey sediment elevations in the remnant pool. However, the elevation of the sediment upstream of the fish ladder and sluice gate can be visually surveyed from the dam. The remnant pool would be visually monitored to assess sediment changes during high flow events. For example, standing waves or lodged debris could indicate shallow depth. The trigger conditions that would signal a problem with excessive sediment buildup include reduced fish passage upstream of the ladder and water depths of less than one foot in the channel or remnant pool. In addition, the concentration of suspended sediment in the water flowing in the fish ladder and over the spillway would indicate the proximity of sediment to the ladder.

3.3 FISH PASSAGE MANAGEMENT COMMITTEE

A Fish Passage Management Committee (Committee) would be established and tasked with determining and selecting sediment management to effectively maintain sediment management and fish passage based on current information regarding conditions upstream of SCD. The committee would consist of CAW and representatives from NMFS, California Department of Fish and Game, and Monterey Peninsula Water Management District.

CAW would be responsible for implementing sediment management data collection and analysis and for providing management recommendations to the Committee. The Committee would approve sediment management actions and would help select sediment management tools in response to changes from baseline conditions as they arise. The Committee would meet annually during the dry season. CAW (“applicant”) would call wet season meetings only if monitoring results indicate a need for further sediment management. While the Committee would guide the application of tools described in this Plan, CAW would retain operational responsibility of SCD.

Figure J-4: Schematic Representation of the Wet Season Sediment Management Actions



LITERATURE CITED

Mussetter Engineering, Inc., 2006. Evaluation of Sediment Sluicing Options Associated with the San Clemente Dam Fish Ladder. Prepared for Montgomery Watson Harza, March 16, 2006.

Mussetter Engineering, Inc., 2007b. Additional Modeling to Evaluate Sediment Sluicing Options and Compare Downstream Sediment Concentrations for EIR/EIS Alternatives, for the San Clemente Dam Removal/Retrofit Project. Prepared for Montgomery Watson Harza, March 23, 2007.

Appendix K

STORMWATER POLLUTION PREVENTION PLAN

San Clemente Dam Seismic Safety Project

Storm Water Pollution Prevention Plan

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LIST OF ATTACHMENTS

Attachment A: Location Map
Attachment B: Typical Drawings
Attachment C: Notice of Termination Form
Attachment D: Report Form for Inspections

The attachments are not included in this copy

STORM WATER POLLUTION PREVENTION PLAN

1. INTRODUCTION

This Storm Water Pollution Prevention Plan (SWPPP) has been prepared to comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Construction Activities (U.S. Environmental Protection Agency [USEPA], February 17, 1998). This plan presents the means for controlling the off-site discharge of pollutants associated with storm water discharges associated with construction activities on the San Clemente Dam Seismic Retrofit Project.

The State of California, under the regulatory authority of the Regional Water Quality Control Boards (RWQCB), has authorization from the USEPA to regulate storm water discharges from construction activities. As owner of San Clemente Dam (SCD), the California American Water Company (CAW [otherwise referred to as "applicant" on future actions relating to this project]) will submit a Notice of Intent to the Central Coast Regional Water Quality Control Board (CCRWQCB) so that project construction activities will be covered by the General Permit prior to the beginning of construction. The SWPPP will be submitted to the CCRWCQB for approval before construction begins.

In general, this SWPPP includes specifications for best management practices that will be utilized to control erosion and sedimentation during construction to minimize impacts resulting from construction activities. CAW's objective is to minimize the potential for erosion and sedimentation during dam conversion activities, and to effectively restore disturbed areas created during construction activities at the SCD. The measures described in this plan are intended to prevent discharge of pollutants during construction activities. CAW will meet these objectives by employing the erosion and sediment control measures set forth in this plan. This plan presents typical structural and non-structural erosion and sediment control measures and management practices that will be implemented during construction activities. The erosion and sediment control measures described in this plan will serve as minimum standards during construction. In general, the measures are designed to minimize erosion and sedimentation by:

- Minimizing the quantity and duration of soil exposure;
- Protecting critical areas during construction by reducing the velocity of run-off and redirecting runoff away from disturbed areas;
- Installing and maintaining erosion and sediment control measures during construction;
- Re-establishing vegetation as soon as possible following final grading; and

- Inspecting and maintaining erosion and sediment controls as necessary until final stabilization and revegetation is achieved.

Environmental Inspectors (EIs) will be responsible for ensuring that contractors implement and maintain erosion and sediment control measures during construction. This plan and a copy of the Notice of Intent will be kept at all of the construction sites (if practical) or at the nearest contractor office or trailer and plan will be available for review upon request.

All personnel involved in the project will attend an environmental training program that will include a discussion on general erosion and sediment control requirements, proper clearing and grading methods, and the importance of protecting sensitive resources on the project. Crews specializing in erosion control tasks will be given additional training on proper installation and maintenance of erosion and sediment control measures.

To be eligible under the NPDES general permits for storm water discharges from construction activities, an applicant must certify that storm water discharge will not adversely affect threatened and endangered species. The applicant will review the completed and ongoing threatened and endangered species consultations with various agencies for this project in the application. Storm water discharges from this project are not expected to have adverse affects to threatened and endangered species.

In general, construction activities proposed can be mitigated with BMPs discussed in this SWPPP. Potential short-term, significant and unavoidable water quality impacts are projected in the event of a reservoir drawdown. Lowering water levels would increase turbidity and decrease dissolved oxygen levels, which could adversely affect aquatic organisms in the reservoir. In order to mitigate effects of this drawdown, the reservoir water level would be drawn down at a relatively slow rate (about 0.5 feet or less per day), similar to that currently being used for the annual drawdown (an interim dam safety measure). Other unavoidable elevated turbidity levels are projected in the operation of sluice gates, which would increase the sediment load to the downstream river. To minimize the effect of this increased turbidity on species downstream, operation of sluice gates would occur during periods of high runoff as specified in the detailed sluice plan put forth in the Sediment Management and Operations Plan (SOMP) (Appendix J). In addition, establishment of appropriate turbidity standards to reduce turbidity impacts will be developed in consultation with the appropriate permitting agencies prior to construction. Further discussion of these issues can be found in Section 4.3 (Water Quality) of the EIR/EIS.

The NPDES general permits for storm water discharges from construction activities have removed the requirements for review of historic preservation issues. Rather the USEPA is conducting consultations on a case-by-case basis. However, since the CAW San Clemente Dam Seismic Safety Project is being conducted under the jurisdiction of the US Army Corp of Engineers (USACE), a historic preservation review has been conducted. The review activities are summarized in Cultural Resources (Section 4.1).

The report documents the surveys and consultations that were conducted and were ongoing as of the date of the report as required the National Historic Preservation Act.

Additional materials to accompany this plan will be included in the following attachments upon finalization of the plan:

- Attachment A – Location Map
- Attachment B – Typical Drawings
- Attachment C - Notice of Termination
- Attachment D - Report Form for Inspections

2. DISCUSSION OF POSSIBLE CONSTRUCTION ACTIVITIES

The need for the San Clemente Dam Seismic Safety Project is to increase dam safety to meet current standards for withstanding a Maximum Credible Earthquake (MCE) and passing the Probable Maximum Flood (PMF) at the dam. Construction activities for the San Clemente Dam Seismic Safety Project would vary depending on the alternative selected. Most alternatives include work on access roads and the fish ladder. In addition, a new facility to divert water will be constructed upstream of the dam to replace the existing surface water diversion at San Clemente. The water diversion facility would apply to Alternatives 1, 2, and 3 of the San Clemente Dam Seismic Safety Project. Existing access roads with minor improvements would be used to reach the base of the dam. The Old Carmel River Dam Bridge (OCRB) and the access road from the filter plant to the dam would be improved. The existing access road along the east side of the Carmel River, between Old Carmel River Dam and the base of San Clemente dam would be rebuilt. Under some of the alternatives, an existing 4WD road would be improved to connect Cachagua Road with the sediment disposal site. This route would be used only to move construction equipment and materials necessary to construct the road, prepare the sediment disposal site, and connect the sediment disposal site to the dam by conveyor belt. All sediment transport would occur via conveyor belt from the dam to the disposal site. Accumulated sediment in the reservoir would be removed over multiple seasons by excavation with heavy equipment. No sediment would be hauled by truck over any roads. This preliminary Plan is a comprehensive discussion of all the possible construction activities independent of the alternative selected.

Under the Proponent's Proposed Project and some of the alternatives, the existing fish ladder would be removed and replaced to accommodate the lowered dam elevation and to comply with existing criteria for fish passage promulgated by the National Marine Fisheries Service (NMFS) and the California Department of Fish and Game (CDFG). A tower crane would be staged at the base of the dam to move construction materials from the batch plant to the dam face and fish ladder. A high-level outlet equipped with a sluice gate would be installed to enable controlled and limited sediment releases to maintain both upstream passage to the fish ladder exit. Sediment in the reservoir would

be removed down to various levels depending on the selected alternative. The historic Carmel River channel exposed by sediment excavation in the reservoir's inundation zone would be restored as needed. Additional construction activities would depend on the alternative selected; however the actual construction disturbances would be within the vicinity of the dam structure.

Several of the alternatives would include a number of activities, some of which will not result in disturbance of soil. Those activities include upgrading the electrical system at the dam to support a conveyor sediment transport system.

Construction activities for alternatives may involve clearing and grading, excavation, pipe laying or other activities, backfilling, cleanup and restoration. The actual activities conducted at any given site will depend on the specific alternative selected. However, all activities that will involve ground disturbance are subject to the provisions of the General Permit.

All disturbed areas will be returned to pre-construction contours, as near as practicable and stabilized, as appropriate. Thus, the only changes expected to occur in regard to storm water runoff, will be temporary soil disturbances created during construction.

Because of the variety of topographic settings, runoff coefficients for every construction location are not presented in this plan. The runoff coefficient values will vary significantly based on the various soil types that will be encountered. Construction reclamation efforts will return project-disturbed areas to pre-construction contours, and all project disturbances will be stabilized and revegetated. Therefore, no appreciable difference between pre- and post-construction runoff coefficients is expected, but a monitoring program, regulated by the CCRWQCB, the CDFG, and the USACE as appropriate, will be executed for a 10 year period.

Potentially hazardous materials that may be stored at construction sites could include diesel fuel, fuel oil, hydraulic oils, lubricants, and small amounts of other chemicals. These materials will be handled according to the provisions of the Spill Prevention Control and Countermeasure Plan (SPCC Plan). The SPCC Plan details how these materials will be stored and handled as well as containment, cleanup, and reporting procedures that will be followed in the event of a spill or release of these materials.

3. EROSION AND SEDIMENT CONTROL

Best Management Practices (BMPs) are incorporated into this SWPPP to prevent erosion and protect water quality, control dust control, minimize loss of native vegetation, protect wildlife, protect cultural resources, protect and minimize potential adverse impacts to wetlands and water bodies. Construction contractors will submit additional BMPs to the Project Engineer that conform to this SWPPP. The SWPPP may be further modified during permit consultation with the CCRWCQB. The Contractor will implement the BMPs during construction to control the off-site discharge of pollutants.

3.1 General Measures

Temporary erosion and sediment control measures along with methods for minimizing demolition impacts are designed to effectively reduce erosion and the transport of sediment, and to protect sensitive resources during construction. The following general environmental protection measures will be implemented to minimize environmental impacts during construction and operation of the project:

- All personnel, vehicles, and equipment will stay in the designated construction areas. Access roads outside of the construction area will be designated by CAW. All staking, flagging, and exclusion fencing will be respected.

- Construction, cleanup, and reclamation will be managed to minimize the time between grading, trench excavation, backfilling, and final restoration/reclamation.

- Temporary erosion/sediment control devices will be installed immediately after initial soil disturbance and will be maintained throughout construction and restoration, as necessary, until replaced by permanent erosion control measures.

- Permanent erosion control measures and final cleanup will be completed within 10 days of completion of the dam seismic retrofit. If this schedule cannot be met, these activities will be completed as soon as possible. In no case will final cleanup be delayed beyond the end of the next recommended seeding season.

- A stockpile of erosion control materials, including straw bales, silt fence, and geotextile fabric, will be stored at the contractor yard during the entire period that construction disturbance occurs. Materials will be stored for planned use during construction, and sufficient additional quantities will be stored for maintenance and emergency use.

- Blasting mitigation devices will be utilized as needed in the construction process whenever demolition occurs on the SCD site.

- Environmental Inspector(s) will verify compliance with the environmental requirements throughout construction.

3.2 Sediment Control Plan Elements

Temporary sediment barriers are designed to reduce the velocity of water flow and intercept suspended sediment conveyed by sheet flow, while allowing runoff to continue down gradient. These installations are used to limit sediment transport out of the construction area. Temporary sediment barriers will be installed at the following locations immediately after initial ground disturbance:

- adjacent to paved roadways, drainages, wetlands (dry or wet), springs (dry or wet), impoundments (dry or wet), and other sensitive resources where the topography will direct sediment into these resource areas;

- around soil or spoil piles, where necessary (e.g., adjacent to flowing drainages); and

- Where requested by the Environmental Inspector to prevent significant sediment transport into adjacent resource areas.

- Straw bale or silt fence sediment barriers will be placed at the bottom of slopes and will be located at least 6 feet from the toe of the slope, where possible, in order to increase ponding volume. The ends of the sediment barrier will be turned upslope to capture sediment.

- Sediment barriers will be placed so as not to hinder construction activities and above the ordinary high water mark of active stream channels. If silt fences or straw bale sediment barriers are placed across the construction area, provisions will be made for traffic flow. A gap approximately 15-feet-wide, will be provided along the silt fence or straw bale row, with the ends of the sediment barrier turned slightly upslope. Across the gap, a driveable earth berm will be installed and maintained immediately upslope of the sediment barrier (upturned ends of the sediment barrier will tie into the driveable earth berm).

- If sediment builds up to greater than 40 percent of barrier capacity, the sediment will be removed or spread on the sediment disposal site. Damaged or undermined sediment control barriers will be repaired or replaced as described in this plan.

3.2.1 Straw Bales

Straw bale sediment barriers consist of a row of tightly abutted straw bales placed perpendicular to the runoff direction with the ends turned upslope. The barriers are typically one bale high, placed on the fiber-cut edge (ties not in contact with the ground) in a 4-inch-deep trench, and anchored securely with two wooden stakes driven through each bale. Soil will be placed and compacted along the toe of the uphill side of the straw bale barrier. If a dugout area cannot be excavated due to the presence of rocky material, the Contractor will install the straw bale so that the bale will not be undermined.

Only straw bales that are certified to be free of noxious weeds will be used. The Contractor will acquire weed-free straw and provide the “applicant” with the appropriate documentation.

3.2.2 Silt Fences

Silt fence composed of commercial filter fabrics with sufficient strength to prevent failure will be provided and installed by the Contractor. The height of the silt fence will not exceed 36 inches above the ground. The fabric will be cut from a continuous roll of fabric with splices only at the support posts. When splicing sections, at least a 6-inch overlap of fabric will be secured and wrapped to the post(s). Support posts will be a maximum of 10 feet apart.

The bottom edge of the silt fence will be installed in a trench excavated approximately 4 inches wide by 6 inches deep and refilled with compacted soil, unless on-site constraints dictate otherwise (e.g., rock). If a trench cannot be excavated, the Contractor will secure the bottom edge of the silt fence so that it will not be undermined. Silt fences will be attached to supporting posts by staples or wire. As determined by the Environmental Inspector, a wire fence may be used instead of wooden support posts to provide additional strength on hillsides.

3.2.3 Sandbags

Sandbags may be used as dikes or sediment barriers to control sediment in drainage swales. Sandbags can be strategically placed to control runoff, dissipate runoff energy, and catch sediment (i.e. as a "J" hook at the end of a waterbar).

3.3 Erosion Control Plan Elements

Temporary erosion control measures will be installed where needed immediately following significant soil disturbance and will be maintained throughout the course of construction. In general, temporary erosion control measures will be removed during cleanup activities after permanent erosion control measures have been installed. Permanent erosion control measures are designed to minimize erosion and sedimentation after construction until revegetation efforts have effectively stabilized the construction area...

3.3.1 Waterbars

Waterbars are utilized in various forms (e.g., rolling dips on access roads, driveable berms across travel ways, waterbars on slopes, etc.) during project construction and after final grade restoration. Waterbars are intended to intercept water traveling down a disturbed slope and divert water off disturbed soil into stable, well-vegetated, or adjacent rocky areas.

Waterbars will be installed near the base of slopes adjacent to wetlands and drainages, except at those specific sites (e.g., terrain slopes away from a canal) where, in the judgment of the Environmental Inspector, waterbars are not necessary to prevent discharge of sediment into sensitive resources. The general spacing for temporary and permanent waterbars is as follows:

- 300 feet for slopes of 5 to 15 percent
- 200 feet for slopes of 15 to 30 percent
- 100 feet for slopes greater than 30 percent

The Environmental Inspector can modify the final spacing of waterbars in the field. Waterbar spacing is based on a site-specific evaluation of the project site and standard construction protective measures. This spacing takes into account the soils, timing of

construction, and area of disturbance anticipated for construction of the project. Except for site-specific situations as determined by the Environmental Inspector (e.g., extremely long slopes with highly erodible soils), waterbars will not be constructed on slopes with less than a 5 percent gradient.

Earthen waterbars will be constructed of existing suitable material and compacted to increase durability. Alternatives to waterbars may include a series of tightly abutted straw bales (constructed as per Section 3.1.1.2), excelsior logs, or abutted burlap bags filled with native sand/soil. The installation angle will be two to eight percent down slope (as measured by a hand-held clinometer or level) and will extend to, or slightly beyond, the edge of the disturbed construction area, but within the boundaries of the project area.

Where possible, waterbars will discharge into stable, non-erosive (vegetated or rocky) receiving areas. In isolated instances where waterbars discharge into unstable or highly erosive areas without rock or vegetation, flow energy dissipators or “J-hook” shaped sediment barriers may be positioned at the waterbar outlet. Additionally, in highly erodible soils, the spacing between waterbars may be decreased to further slow the velocity of water. Whenever feasible, waterbars will be sited so that they do not outlet directly into sensitive resource areas (e.g., cultural sites, rare plant sites, drainages, waterbodies, wetlands, etc.).

The Contractor will regularly inspect and repair waterbars during construction to maintain their effectiveness. Waterbars worn down by heavy construction traffic or filled with sediments will be repaired, as needed, and the sediment will be spread on the disturbed area uphill of the waterbar.

3.3.1 Check Dams

Where determined necessary by the Environmental Inspector, the Contractor will install check dams in bar ditches or other intermittent drainages to minimize the transport of sediment from the construction zone. Check dams will be constructed of staked straw bales or stacked sand bags just inside the drainage area edge. The center of the structure will be lower than the ends to channel water and create a sediment dump immediately upstream of the structure. The structure, and any deposited sediment, will be removed following final restoration of the site.

3.3.2 Surface Roughening

Surface roughening involves tracking of the ground surface with heavy machinery creating a series of shallow depressions running parallel to the ground surface contours. Surface roughening assists in controlling erosion by reducing the speed of storm water runoff, increasing infiltration, and trapping sediment.

3.4 Blasting Mitigation Plan Elements

Should the alternative selected entail demolition components, potential water quality impacts related to these activities would be mitigated to a less-than-significant level by implementing appropriate BMPs. These are described in the following paragraphs.

3.4.1 Blasting Mats

The application of blasting mats over concrete blocks at demolition sites prevents flying concrete debris.

3.4.2 Fabric Barriers

Fabric barriers placed on the ground surface in the active construction/demolition area serve to catch sediment and cement debris.

3.5 Hazardous Materials Management

Care will be taken during construction to prevent the discharge of potential pollutants such as construction materials, petroleum products, debris, and sanitary wastes into Waters of the United States. Each contractor will submit and maintain an approved Spill Prevention Control and Countermeasure Plan (SPCC Plan) on site and will conduct activities according to their plan. The SPCC Plan will be prepared and certified by a California Registered Professional Engineer to comply with the provisions of the EPA Oil Pollution Prevention Regulation. The SPCC Plan will address the following areas:

- Operating procedures that prevents oil spills
- Control measures installed to prevent a spill from reaching navigable waters
- Countermeasures to contain, clean up, and mitigate the effects of an oil spill that reaches navigable waters

The SPCC Plan, at a minimum will include the following measures to protect water quality:

- Refueling of construction equipment and vehicles in the staging area would only occur within a designated, paved, and bermed area where possible spills can be contained. Fuel storage would be in double contained areas, capable of holding 125 percent of the volume of fuel being stored.
- Truck and cement equipment wash-down would not occur in the ordinary high water area of the channel.
- Equipment and vehicles operated within the ordinary high water would be checked and maintained daily to prevent leaks of fuels, lubricants, or other fluids to the stream.

- Litter and construction debris would be removed from below the ordinary high water line daily and disposed of at an appropriate site. All litter, debris, and unused materials, equipment or supplies would be removed from the construction staging areas above ordinary high water at the end of the construction season.

- At the end of each workday, all construction equipment will be moved to the staging area to protect against accidental spills.

- All vehicles carrying over 150 gallons of fuel will have a fuel spill prevention plan and all materials required to clean up a spill if it were to occur in transit. In some cases, a vehicle following the fuel truck would carry the clean-up equipment.

Fueling of construction equipment will be restricted within 100 feet from streams or wetlands unless site conditions preclude this (i.e., steep slopes on which movement of equipment to fueling stations would create excessive disturbance). In these areas, special precautions may be implemented at the approval of the Environmental Inspector. In all cases, refueling will be conducted in accordance with the SPCC Plan. No storage of hazardous materials, chemicals, fuels, or lubricating oils will be allowed within 100 feet of stream and wetlands. Refueling will also be restricted within 200 feet of any known potable private water well and within 400 feet of any municipal or community water supply well. The Environmental Inspector will install “No Refueling” signs along the project site in areas where refueling and maintenance of vehicles is restricted to warn construction workers of the restriction in the area.

3.6 Wetlands

When the construction activities encounter wetlands, CAW will protect and minimize potential adverse impacts to wetlands by:

- Expediting construction in and around wetlands, and limiting the amount of equipment and mainline construction activities within wetlands to reduce disturbances of wetland soils;

- Restoring wetlands to their original configurations and contours;

- Permanently stabilizing upland areas near wetlands as soon as possible after completion of ground disturbing work; and

- Inspecting the project area periodically during and after construction and repairing any erosion control or restoration features until vegetation is successfully established on the upland portions of the project area.

3.7 Waterbodies

No perennial waterbodies have been identified within the proposed construction areas. However, in the event that waterbodies are encountered, CAW will protect and minimize potential adverse impacts to waterbodies by the following protective measures:

- Expediting construction and limiting the amount of equipment and activities in waterbodies;
- Reducing clearing, leaving in place as many trees as possible on stream banks;
- Constructing waterbody crossings as perpendicular to the axis of the waterbody channel as engineering and routing conditions allow;
- Maintaining ambient downstream flow rates;
- Removing all construction material and structures from the waterbody after construction;
- Restoring stream channels and bottoms to their original configurations and contours;
- Permanently stabilizing stream banks and adjacent upland areas after construction; and
- Inspecting the project area periodically during and after construction and repairing any erosion controls and/or performing restoration, as needed, in a timely manner.

4. CLEANUP AND RECLAMATION

4.1 Cleanup

After final construction on the dam, all disturbed portions of the construction area, including the access roads, and staging areas, will be returned to preconstruction grades and contours. Construction debris will be removed from the project site and shall be graded where appropriate and decompacted so that the soil is left in the proper condition for planting. Permanent water bars (constructed in the same manner as temporary waterbars) will be constructed after final grading and prior to seeding.

Every effort will be made to complete final cleanup and installation of permanent erosion control measures within 10 days after final backfilling is complete. If this schedule cannot be met, final cleanup will be completed as soon as possible. In no case will final cleanup be delayed beyond the end of the next recommended seeding season. Sediment barriers left in place after construction will be limited to earthen berms, waterbars, and diversion swales, although silt fences may be left in place in specific locations at the direction of the Environmental Inspector.

4.2 Reclamation

Reclamation, including alleviating soil compaction, final seedbed preparation, and revegetation, will occur immediately after final cleanup. Reclamation and revegetation of the project site incorporates permanent erosion and sediment control measures. However, if final restoration cannot occur in a timely manner due to weather or soil

conditions, temporary erosion and sediment control measures will be employed until the weather is suitable for final cleanup and revegetation. Seeding may be postponed until conditions allow (e.g., time of year, soil moisture, or weather conditions). However, in no case shall final cleanup be delayed beyond the end of the next recommended seeding season. If final reclamation or reseeding is delayed more than 30 days before the perennial vegetation seeding season, areas adjacent to waterbodies shall be mulched with 3 tons/acre of straw, or its equivalent, for a minimum of 100 feet on either side of the waterbody.

Wherever possible, sediment barriers left in place after construction will be limited to earthen berms, waterbars, and diversion swales, although silt fences may be left in place in specific locations at the direction of the Environmental Inspector.

4.3 Revegetation and Seeding

Following final recontouring of the project site and installation of permanent erosion control measures, the project site will be seeded with a seed mix that is native and appropriate for the local conditions. Due to the dispersed nature of this project, the Environmental Inspector, in conjunction with the landowner, will determine the specific revegetation requirements (including seed mixtures and soil amendments) for each site. The project site will be seeded within 6 working days of final grading in accordance with recommended seeding dates, weather and soil conditions permitting. Slopes steeper than 3:1 will be seeded immediately after final grading in accordance with recommended seeding dates, weather permitting.

Prior to application of the seed, the seedbed will be prepared to depth of 3 to 4 inches using appropriate equipment to provide a firm, smooth seedbed that is free of debris. For broadcast and hydro-seeding, the seedbed will be scarified to ensure sites for seeds to lodge and germinate. The seed will be applied and covered uniformly per local soil conservation authorities recommendations for the seed mixture being applied. A range drill will be used on many of the disturbed sites, however, broadcast or hydro-seeding may also be used at double the recommended seeding rates. Where broadcast seeding is used, the area will be lightly raked or dragged with appropriate equipment after seeding to lightly cover the seeds.

Seed will be purchased in accordance with the specifications for seed mixes described in the Botanical Resource Management Plan (Appendix U). and used within 12 months of testing. PLS is an agricultural industry standard that omits dust, chaff, and empty seed, weed and other crop seed in the calculation of the weight and value of purchased seed. Specifics on the calculation of PLS can be found at http://www.dot.state.tx.us/mnt/wildflower/pls_explanation.htm. Legume seed will be treated with a species-specific inoculate per manufacturer’s specifications.

4.4 Mulching

Mulch, consisting of weed-free straw, wood fiber, or an approved equivalent, may be applied to disturbed soils to minimize the effects of wind or rain on exposed soils.

During rainy conditions, mulch reduces the impact of rainfall in initiating erosion and slows the down slope velocity of surface flow.

4.4.1.1 Straw Mulch

An acceptable application of straw mulch will include the following:

- Straw mulch will be required in the following areas:
  - within 100 feet of flowing streams;
  - slopes of 30 to 40 percent with less than 70 percent surface cover; and
  - slopes of 0 to 30 percent with highly wind erodible soils and less than 70 percent surface cover, as directed by the Environmental Inspector or other qualified personnel.
- Straw mulch will be applied at a rate of 2,000 to 4,000 pounds (3,000 on average) per acre, as directed by the Environmental Inspector. Mulch rates may be reduced or eliminated by the Environmental Inspector, where necessary.
- Only straw that is free of noxious weeds will be used. Written confirmation from an approved supplier will be required.
- Straw fiber length will be at least 8 inches long to facilitate crimping in place after application.
- Equipment specifically designed to crimp straw will be used to crimp straw fibers to a depth of 2 to 3 inches. Steep slopes inaccessible with a crimper will be crimped by tracking with tracked equipment running perpendicular to the slope. Farm discs will not be allowed for crimping.
- Acceptable straw mulch crimpers include:
  - mechanical crimper;
  - backhoe with crimper forks;
  - tracked equipment tracking up and down slopes (restricted to areas where other methods will not work); or
  - Equivalent, as approved by the Environmental Inspector.
- If a straw mulch blower is used, strands of the mulching material will be at least 8 inches long to allow anchoring. Alternatively, organic liquid mulch binders may be used in accordance with the manufacturer's recommendations and with CAW's approval.

If reclamation and seeding is deferred more than 10 days after final grade restoration, all disturbed slopes above waterbodies and wetlands will be temporarily stabilized by applying 3 tons of dry straw mulch per acre for a minimum distance of 100 feet above the edge of the waterbody or wetland.

After final restoration and seeding, mulch will be applied to all dry sandy sites, slopes greater than 8 percent, and all slopes within 100 feet of waterbodies to control erosion. Mulch will be spread over the area to a visible coverage of at least 75 percent of the ground surface and at a rate of 2 tons of dry straw (or functional equivalent) per acre.

4.5 Matting/Netting

Where determined necessary by the Environmental Inspector and/or Construction Inspector, erosion control matting will be installed along the stream banks of flowing streams and steep slopes (greater than 33 percent) after final grade restoration to reduce rain impacts on soils, to control erosion, and to stabilize steep slopes and waterbody banks.

The Contractor will use matting supplied in continuous rolls of 30 feet or greater with a minimum width of 4 feet. Staples will be made of wire, 0.09 inch in diameter or greater, and have a “U” shape with legs 8 inches in length and a 2-inch crown. Wire staples will be driven into the ground for the full length of the staple legs. Alternatively, wood pegs (0.5-inch-diameter) may be used to secure the erosion control fabric. In areas of active livestock grazing, protection measures other than fabric must be used.

Matting will be anchored, as it is unrolled to prevent stretching of the material and incomplete ground contact. For stream bank installations, mats will be laid parallel (upper mat overlapping lower mat in a shingle pattern) to the waterbody to a point above the top of the bank. Native materials (e.g., rocks, logs, etc.) may be used in conjunction with the matting to aid in bank stabilization.

During regular erosion control monitoring, erosion control matting will be inspected for washouts, adequate staking, and loss of matting. Damaged or undermined matting will be repaired or replaced, as necessary.

5. MAINTENANCE AND REPORTING

5.1 Inspection and Modifications

Throughout construction, the Engineer, Contractor and the Environmental Inspector will inspect temporary erosion control structures as follows:

- daily in areas of active construction or equipment operation;
- on a weekly basis in areas with no construction or equipment operation; and
- In all areas of the project site within 24 hours of each 0.5-inch or greater rainfall event, soil and weather conditions permitting.

The Environmental Inspector (EI) will document all erosion control inspections in the Environmental Daily Inspection Report. In the event of forecasted impending heavy precipitation, all temporary erosion control devices found needing repair or new

installation will be repaired immediately. During this period, the Contractor will provide additional personnel, vehicles, and materials to repair erosion control structure damage where noted during the inspection.

Should structures clog, deteriorate, fail, be damaged, or require maintenance, the Contractor will conduct repairs or replacements within 24 hours after problems have been identified, weather and soil conditions permitting. Additionally, changes to the SWPPP will be made reflecting any corrective measures determined necessary during the inspection.

On sites that have been finally stabilized or where runoff is unlikely due to seasonal arid periods in arid areas (average 0 to 10 inches of rainfall) or semi-arid areas (average 10 to 20 inches), inspections will be conducted at least once every month until the project site revegetates successfully. Inspections will take place until coverage under the permit is terminated.

Based upon the results of the inspection, this plan will be revised as needed within seven calendar days to address pollution sources identified and pollution prevention measures recommended. Any changes to this plan will be implemented before the next anticipated storm event or as soon as practicable following the inspection. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of this SWPPP, and actions taken resulting from observation made during the inspection will be made and retained as part of the plan for at least 3 years following the date of the inspection.

5.2 Reporting

Any noncompliance or discharge that may seriously endanger health or the environment will be reported as soon as possible, but no later than 24 hours from the time “the applicant” first becomes aware of the circumstance. The report will be made to the appropriate agency in accordance with the SPCC Plan and will be made to the US EPA Emergency Response Branch, and the appropriate State Agency. In addition to verbal notification, a written submission to both the USEPA and the State Agency will be provided within 5 days of the time that CAW becomes aware of the circumstances. The submission will contain the following:

- Description of the noncompliance and its cause;
- Period of noncompliance, including exact dates and times;
- Estimated time noncompliance is expected to continue, if it has not been corrected; and
- Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

5.3 WATER QUALITY MONITORING

6. COMPLETION PROCEDURES

6.1 Notice of Termination

Following completion of construction activities and final stabilization of disturbed areas, a Notice of Termination (NOT) will be submitted to the USEPA at the address indicated on the NOT form. In California, the NOT will be submitted to the Executive Officer of the Regional Water Board responsible for the area in which the facility is located. The mailing address is:

Central Coast Regional Water Quality Control Board
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401
Phone: (805) 549-3147

The NOT serves as notification that permit coverage of storm water discharges associated with the construction activities under the general NPDES Permit have been terminated.

Final stabilization is defined as:

"All soil disturbing activities have been completed and a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas not covered by permanent structures, or equivalent permanent stabilization measures (such as rip-rap, gabions, or geotextiles) have been employed" (USEPA 2005).

"In some parts of the country, background vegetation will cover less than 50 percent of the ground (i.e., arid areas). Establishing at least 70 percent of the native vegetation cover criteria for final stabilization (e.g., if the native vegetation covers 50 percent of the ground), 70 percent of the 50 percent would require 35 percent total cover for final stabilization." (USEPA 2005).

Following completion of construction activities, all disturbed areas will be stabilized either through revegetation or other appropriate measures, except for those areas which were cropland prior to construction and which are to be returned to crop production. After the construction areas are adequately stabilized and a NOT has been filed, no additional storm water management will be undertaken.

7. LITERATURE CITED

USEPA, NPDES General Permit for Stormwater Discharges from Construction Activities. Construction General Permit (CGP) 2003. Modified January 21, 2005. http://www.epa.gov/npdes/pubs/cgp2003_entirepermit.pdf

STORM WATER POLLUTION PREVENTION PLAN CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the systems, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____ _____

Name Date
Title
Company

Appendix L

CARMEL RIVER REACH COMPARISONS

Table TT1. Comparison of reach designations

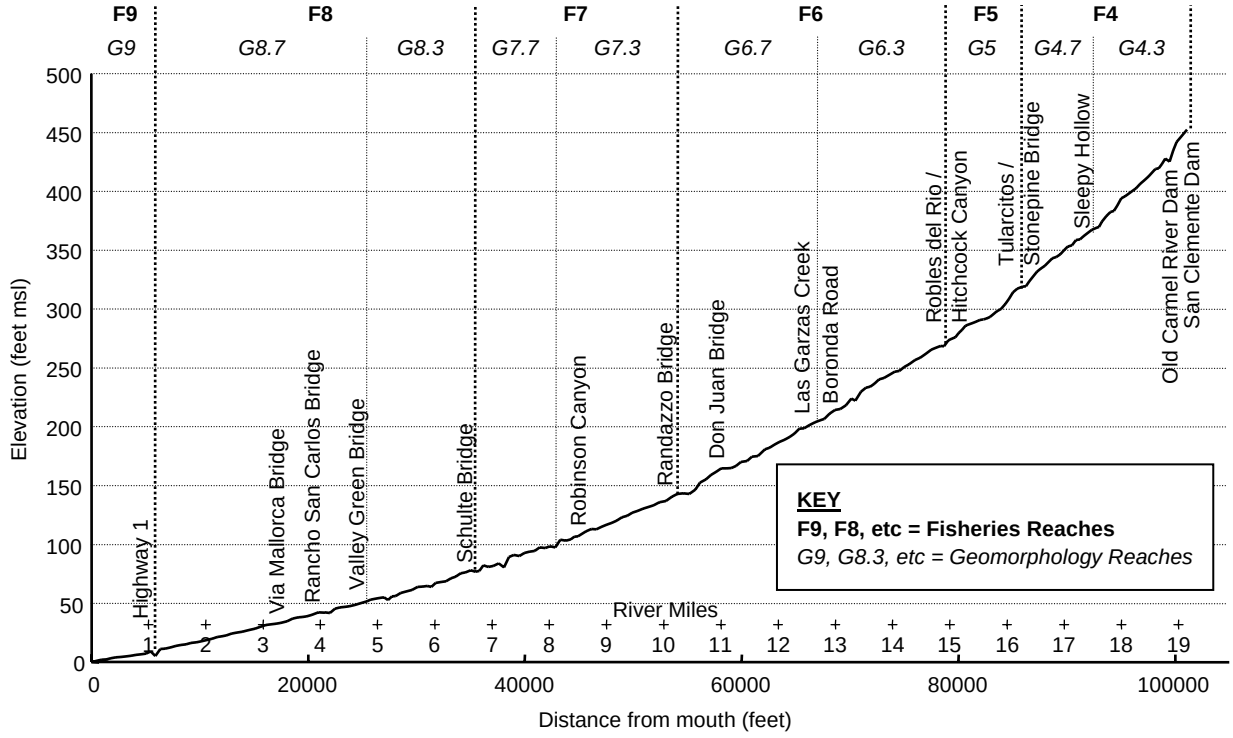
Geomorphology reach no.	Length (mi)	Fisheries reach no.	Length (mi)	Reach description**	Upstream station (River Mile)	Downstream station (River Mile)
		1	1.3	Los Padres Dam to Cachagua Creek	25.3	24
		2	4	Cachagua Creek to San Clemente Dam	24	20
		3	0.9	San Clemente Dam	20	19.1
4.3	1.7	4	3	San Clemente Dam to Sleepy Hollow	19.1	17.4
4.7	1.3			Sleepy Hollow to Tularcitos Creek	17.4	16.1
5	1.3	5	1.3	Tularcitios Creek to Hitchcock Canyon	16.1	14.8
6.3	2.2	6a, b, c*	4.6	Hitchcock Canyon** to Las Garzas Creek	14.8	12.6
6.7	2.4			Las Garzas Creek to Randazzo Bridge	12.6	10.2
7.3	2.1	7	3.5	Randazzo Bridge to Robinson Canyon	10.2	8.1
7.7	1.4			Robinson Canyon to Schulte Road	8.1	6.7
8.3	1.9	8	5.6	Schulte Road to Valley Green Bridge	6.7	4.8
8.7	3.7			Valley Green Bridge to Highway 1	4.8	1.1
9	1.1	9	1.1	Highway 1 to mouth	1.1	0
Total length	**25.3**	**Total length**	**19.1**			

NOTES:

***Fisheries reach no. 6 consists of three subreaches:**

6a	1.5	Robles del Rio** to DeDampiere
6b	1.5	DeDampiere to Borondo Road
6c	1.6	Borondo Road to Garland Park

**Hitchcock Canyon is the same location as Robles Del Rio


F9
F8
F7
F6
F5
F4
G9
G8.7
G8.3
G7.7
G7.3
G6.7
G6.3
G5
G4.7
G4.3
Elevation (feet msl)
Distance from mouth (feet)
River Miles
Highway 1
Via Mallorca Bridge
Rancho San Carlos Bridge
Valley Green Bridge
Schulte Bridge
Robinson Canyon
Randazzo Bridge
Don Juan Bridge
Las Garzas Creek
Boronda Road
Robles del Rio / Hitchcock Canyon
Tularcitos / Stonepine Bridge
Sleepy Hollow
Old Carmel River Dam
San Clemente Dam
KEY
F9, F8, etc = Fisheries Reaches
G9, G8.3, etc = Geomorphology Reaches

Appendix M

SEDIMENT TRANSPORT MODELING

APPENDIX M

SEDIMENT TRANSPORT MODELING

Sediment Management Studies and Sediment Transport Modeling Conducted for the 2000 RDEIR

As described in EIR/EIS Chapter 1, the San Clemente Dam Seismic Safety Project was considered in CEQA processes leading to a Draft EIR in 1998 and a Recirculated Draft EIR (RDEIR) in 2000. Comments on the RDEIR identified sediment management and sediment transport in the lower Carmel River as among the most serious concerns of the project. The National Marine Fisheries Service (NMFS) requested further evaluation of sediment transport and effects with dam removal.

Sediment transport analyses conducted for the RDEIR examined (1) the rate at which sediment stored behind SDC would erode, (2) the suspended sediment concentration in the river downstream of the SDC, and (3) the potential effects of the stored sediment on flooding, channel stability, and habitat conditions in the 19-mile reach of Carmel River between the dam and the Pacific Ocean. Sediment-transport modeling simulated sediment outflow from the reservoir and downstream sediment movement over a 41-year hydrologic period of record. Analysis showed that significant aggradation of sand and fine gravel-sized sediment would occur downstream if the dam were lowered or removed without first removing the stored sediment (MEI 2003).[1] This level of aggradation was considered unacceptable, both in terms of its potential flood risk and its potential to pose a significant barrier to upstream fish migration.

One scenario analyzed evaluated the effects of notching the dam in 15-foot increments every 5 to 10 years until it was completely removed. Again, a significant amount of sediment was found to erode and remain in the downstream river, severely impacting channel stability and flood carrying capacity by the end of the 41-year simulation period (MEI 2003). These results underscored the necessity of excavating the stored sediment to reduce downstream impacts.

Sediment Management Studies and Sediment Transport Modeling Conducted for the Present EIR/EIS

For the present EIR/EIS, further sediment analyses were conducted to investigate all of the action alternatives, including one (Alternative 3) which had not been previously considered in the 2000 RDEIR (MEI 2005, 2006b). (This alternative is described in Chapter 3.5.)

Sediment transport modeling for the Proponent's Proposed Project and Alternative 1 (Dam Notching) considered the proposed use of a sluice gate to manage sediment to maintain steelhead passage through the fish ladder. Instream conditions resulting from

[1] Downstream sediment storage in the river ranged from 100 to 700 AF under various scenarios analyzed, as compared to about 20 AF stored in the channel under baseline conditions.

periodic sluicing were modeled by MEI (2006a) to estimate effects to sediment remaining in the reservoir and to downstream reaches of the Carmel River. The simulations were performed for a single sluice event for one year.

Mussetter Engineering, Inc. (MEI) modeled sediment conditions in the reservoir and the river downstream of SCD using two computer models:

(1) A HEC-6T sediment transport model was used to simulate the accumulation of sediment in the reservoir and sediment releases from the reservoir to the river downstream. Thus, the model simulates the movement of sediment from the reservoir to the ocean. The model uses an assumed upstream sediment load that varies with river flow as the sediment input to the model. The output of this model includes the stored sediment in the reservoir, sediment load passing SCD, and sediment load in the lower river. The HEC-6T model uses a 41-year hydrologic pattern based on the measured flow at the Robles Del Rio gage. Because project-related changes in sediment transport are expected to be greatest in the first year following construction, two different hydrologic time series were used: one that starts with a wet year (1978); and one that starts with a dry year (1985) (MEI, 2006). This was accomplished by organizing the 41-year flow record to start with 1978 or 1985. The hydrology that begins with 1978 is referred to as "wet-year hydrology," and that beginning in 1985 is referred to as "dry-year hydrology."

(2) Sediment management activities were incorporated into the simulations to assess the sediment release downstream. A second model was used to simulate the behavior of sediment in the reservoir when a sluice gate is used to release sediment past the dam. This model tracks the release of sediment through the sluice gate and the subsequent formation of an upstream channel in the remnant pool. This model's output is used in the HEC-6T model to simulate downstream sediment loading. This sluicing model uses a one-year hydrologic record for simulation. The simulations were performed assuming a sluicing event for a single dry year and a single wet year. The sluicing event simulated was a two-hour sluice at a time when the river flow exceeded 300 cfs, and occurring after January 1. The days chosen for simulation of sluicing events were January 4, 1978 (wet year) and February 9, 1985 (dry year). The simulation was continued through the remainder of the year.

Sediment concentrations present in the lower river were analyzed by post-processing the results from the HEC-6T sediment transport model to estimate the suspended sediment concentration. Estimates of concentration were made for the entire reach of the lower river (from SCD to the ocean).

Sediment Transport Modeling

SUMMARY OF MODELING HISTORY

To date, six reports have been published by MEI analyzing the current (baseline) downstream sediment transport, and potential effects resulting from the implementation of a seismic safety project.

(1) The first report (MEI 2003) modeled variations of the current project alternatives. However, because Alternative 3 (Carmel River Reroute) had not been proposed at that time, it was not considered in the report. The results of the 2003 modeling focused on the volume of sediment transported from behind SCD, without any prior sediment removal, down to the mouth of the river. MEI then evaluated changes in channel storage and bed elevation from SCD down to the mouth of the river. The 2003 results indicated that the release of stored sediment in addition to the natural sediment load in the river would cause significant changes in the channel downstream.

(2, 3) Subsequently, MEI prepared three reports (2005, 2006b and 2007a) focusing on the alternatives assessed in the San Clemente Dam Seismic Safety Project EIR/EIS, including prior removal of the stored sediment for the dam removal alternatives. In these reports, the effects of the alternatives were evaluated in terms of timing, volume, and distribution of sediment downstream of the dam site. The size of material transported from the location of the dam site to the downstream reaches was also estimated.

Additionally, two reports were prepared by MEI (2006a and 2007b) because a sluice gate has been proposed for the two alternatives that keep the dam in place (Dam Thickening and Dam Notching). The sluice gate would be one option used to periodically flush sediment away from the ladder and provide flows and sediment transport capacity sufficient to maintain the desired open-channel conditions upstream from the dam. The results of the models depict the size, volume, timing and movement of sediment through the reservoir and downstream to the mouth of the river during sluicing events of various stream flow magnitudes.

SEDIMENT MODELING ASSUMPTIONS AND APPROACH

MEI modeled a baseline condition that reflects current conditions present in the river and reservoir at the time environmental analysis began (because the NEPA/CEQA process occurs over several years, sediment conditions in the reservoir have changed while the EIR/EIS is being prepared, reviewed, and finalized). This baseline was used in the 41-year simulation of sediment movement and represents the condition with the dam remaining in place. The baseline condition begins with about 100 AF of storage remaining in the reservoir at the start of the simulation.

Because the reservoir will soon “fill” with sediment (other than a remnant pool, as explained in Section 4.2.1), MEI developed a modified baseline to simulate the effects of sediment management actions under the Proponent’s Proposed Project and Alternative 1. The modified baseline begins the simulation with the remaining capacity

of the reservoir filled with sediment. This modified baseline was necessary to simulate the sediment management actions with all alternatives at a common starting point relative to the sediment load that would be available to the river downstream of the dam. The modified baseline was used for a single-year simulation. This modified baseline is similar to the Proponent's Proposed Project except it does not include sediment management. MEI modeled the Proponent's Proposed Project by adding sediment management to the modified baseline.

Sluicing is one of the techniques proposed for managing sediment for fish passage, and was simulated using the sediment transport models described above. Modeling was not conducted for all sediment management activities, but was conducted for sluicing because of concerns raised in comments on the Draft EIR/EIS regarding potential impacts related to suspended sediment following a sluicing event. A sluicing event was simulated for the Proponent's Proposed Project to assess effects on fish passage in the reservoir and downstream.

As described in Chapters 3.2 and 3.3, sluicing is accomplished using a gate through the dam that can be opened to release sediment and water. This gate is modeled as a 10 foot diameter pipe located east of the fish ladder (see Figure 4.2-9, Hydrology in the Final EIR/EIS). The total volume of sediment passing through the sluice gate and the volume of sediment stored in the lower river was estimated from the sediment models.

To assess sediment management by sluicing, MEI used the sluicing model to estimate the upstream (reservoir) bed profile through the remnant pool after sluice events lasting 2, 4, 8, and 24 hours, and at sluice flow rates ranging from 300-800 cfs. Based on that analysis, MEI estimated that a 2-hour sluice at 300 cfs would be sufficient to maintain the channel upstream of the dam. Such a sluice would remove about 2.4 AF of sediment. The modeling assumed that the sluice would occur after January 1 when the river flow exceeded 300 cfs. The final sluicing simulation was conducted for one sluicing event in a single year and not the full 41-year simulation. (This was done because it is not expected that sluicing would be needed every year or multiple times per year.)

The results of the simulation were used to assess the need for sluicing and test the validity of the assumption that sluicing would be infrequent. Sluicing under the modified baseline condition was simulated for the Proponent's Proposed Project for a single wet year (1978) and a dry year (1985) (MEI 2007b). The simulations for these specific years for the other alternatives are found in the 41-year simulation. No specific sluicing run was conducted for Alternative 1, which can be extrapolated from the results for the Proponent's Proposed Project. (Alternatives 2 and 3 remove the dam and either excavate and remove the sediment or stabilize it in place; they therefore do not require a sluicing analysis.)

The Sediment Operations and Management Plan for Fish Passage (SOMP, see Appendix J) describes a toolbox of sediment management approaches that may be used under the Proponent's Proposed Project or Alternative 1. Sediment may be

removed upstream of SCD by some form of mechanical excavation using a backhoe or by suction dredging. These sediment removal techniques may be employed if persistent dry year conditions present challenges for fish migration at times when sluicing could damage river habitat or harm adult or juvenile fish in the lower river. Sediment removal techniques such as these would be employed to maintain fish passage through the remnant pool and avoid potential impacts to Reach 4.3 from sluicing. These sediment management tools were not simulated.

At the time that this modeling was conducted, the No Project (No Action) Alternative (Alternative 4) included environmental improvements such as a new fish ladder and sluice gates. For the Final EIR/EIS, these improvements are not considered part of Alternative 4 (see Chapter 3.6), however the modeling that was conducted presents results for an Alternative 4 configuration that includes sluice gates and a new fish ladder. For long-term simulation of sediment movement, the Proponent's Proposed Project is similar enough to Alternative 4 that the results for the two can be considered to be the same. For the one-year sluicing event, a specific model run was conducted for the Proponent's Proposed Project and Alternative 4 by adding sluicing to the modified baseline condition.

Although Alternatives 2 and 3 do not entail sluicing, sediment management actions are undertaken for each of these alternatives that could result in downstream sediment transport. Sediment would be excavated for offsite disposal under Alternatives 1 and 2, and would be redistributed and stabilized in the river under Alternative 3. In each case, the sediment stored upstream of SCD would be excavated using heavy equipment and, after excavation, new channels would need to be constructed, either to provide a new stream channel across the remaining sediment (Alternative 1), or to restore a free-flowing river in its historic channel (Alternative 2), or to create a river channel capable of carrying the Carmel River flow in San Clemente Creek (Alternative 3). At a practical level, not all of the overlying sediment can be removed under Alternative 2 or 3 (and not all the stored sediment is planned for removal under Alternative 1). The ability to completely excavate stored sediment is constrained by the irregular shape of the underlying canyon, obstacles such as boulders, and the need to avoid excavation into underlying native soils. Therefore, sediment transport modeling of Alternatives 2 and 3 assumes that one foot of sediment would remain in the reservoir area after the excavation and dam removal and be available for transport downstream.

RESERVOIR CROSS-SECTIONS

MEI developed assumed cross sections through the reservoir for the Carmel River and San Clemente Creek for the different alternatives (Figures M-1 through M-5). The assumed channels contain a low-flow channel and a flood channel, and are sized for the anticipated flow and sediment loads. These cross sections are based on a hydraulic assessment by MEI that determines the cross section capable of conveying the base flow, median flow, 2-year flood, the 100-year flow, and the probable maximum flood

(MEI 2007a). Each is sized to be stable under the anticipated flow and sediment conditions. These cross sections were used in the modeling of the alternatives.

Downstream of the dam, the individual Carmel River, cross-sections used in the model were grouped within defined river reaches for the presentation and discussion of the results (Table M-1).

FLOW DISTRIBUTION BETWEEN SPILLWAY AND FISH LADDER

The Proponent's Proposed Project and Alternative 1 include a fish ladder that provides access to the remnant pool for migrating fish. The ladder can be operated at different flow rates by reducing the ladder opening at the dam. When the river flow is less than ladder capacity, all of the flow goes through the ladder and the water surface elevation in the remnant pool is controlled by the ladder.

At river flows greater than the ladder capacity, the spillway controls the water surface elevation in the remnant pool. Some water will flow through the fish ladder and some over the spillway. Preliminary modeling indicated that the storage of sediment in the remnant pool for dry years depends on the water surface elevation in the pool. When flow exceeds the ladder capacity, any sediment moving at that flow will deposit at the head (upstream end) of the remnant pool. When all the flow is through the ladder, sediment will move into the pool and approach the dam and ladder. Therefore, simulations were performed both with the fish ladder operating at full capacity and with the ladder operating at a reduced capacity, assumed to be 10 cfs for this analysis.

The purpose of the second simulation is to increase the range of low flows under which the water surface elevation is at the spillway and force any sediment deposition to the head of the remnant pool.

CHANNEL CROSS-SECTIONS

Figures M-1 through Figure M-5 represent theoretical channel cross sections that would be necessary to pass the 100-year flow under the alternatives. These channels are sized to be hydraulically stable and pass the anticipated sediment loads. These channels are used in the sediment transport modeling to assess the movement of sediment upstream of the current damsite and do not reflect the natural channel that existed before construction of San Clemente Dam.

Figure M-1: Typical Cross Section for the Alternative 1 (Dam Notching) in the Carmel River Arm

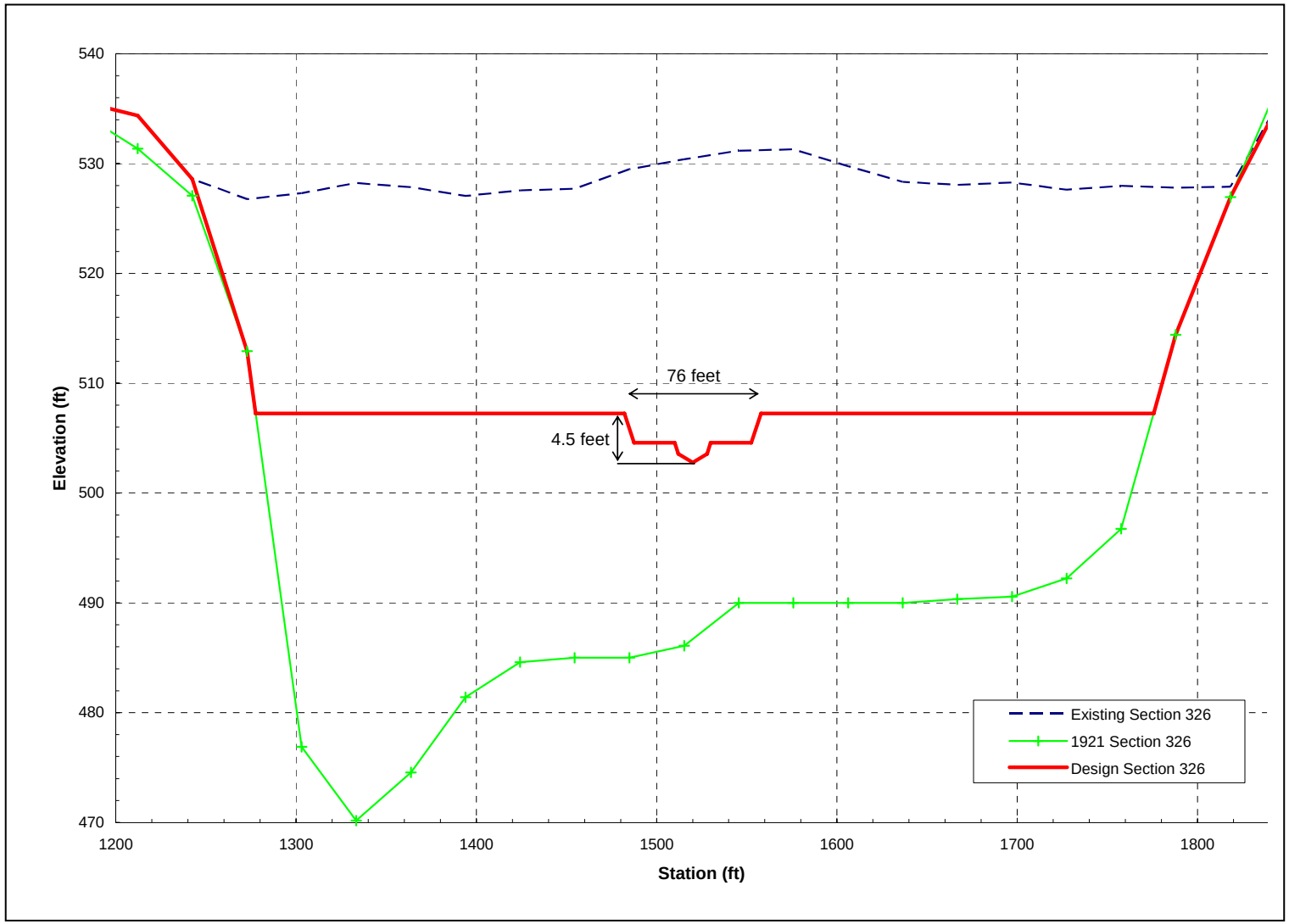


Figure M-2: Typical Cross Section for the Alternative 1 (Dam Notching) in the San Clemente Creek Arm

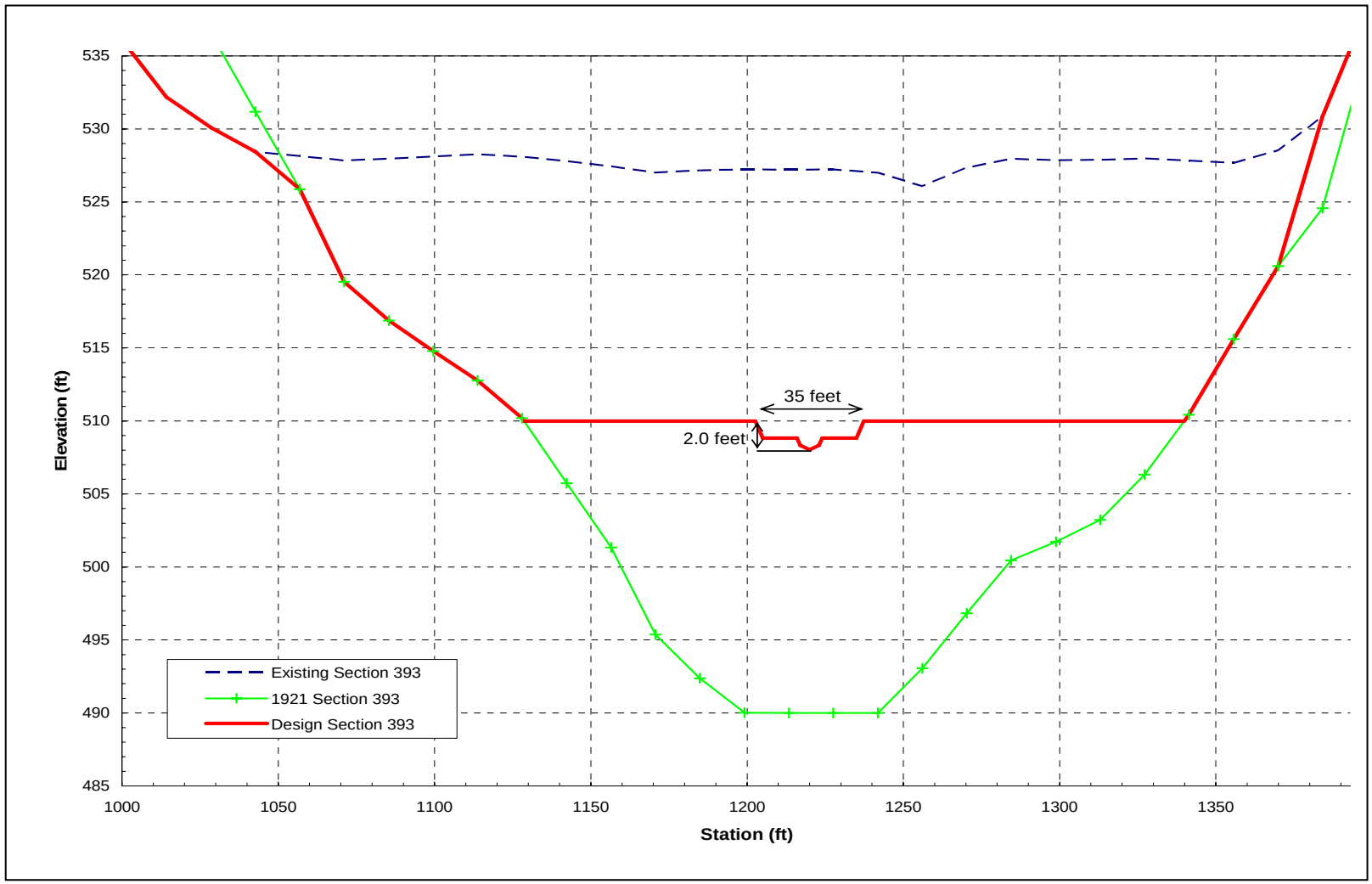


Figure M-3: Typical Cross Section for the Alternative 2 (Complete Dam Removal) in the Carmel River Arm

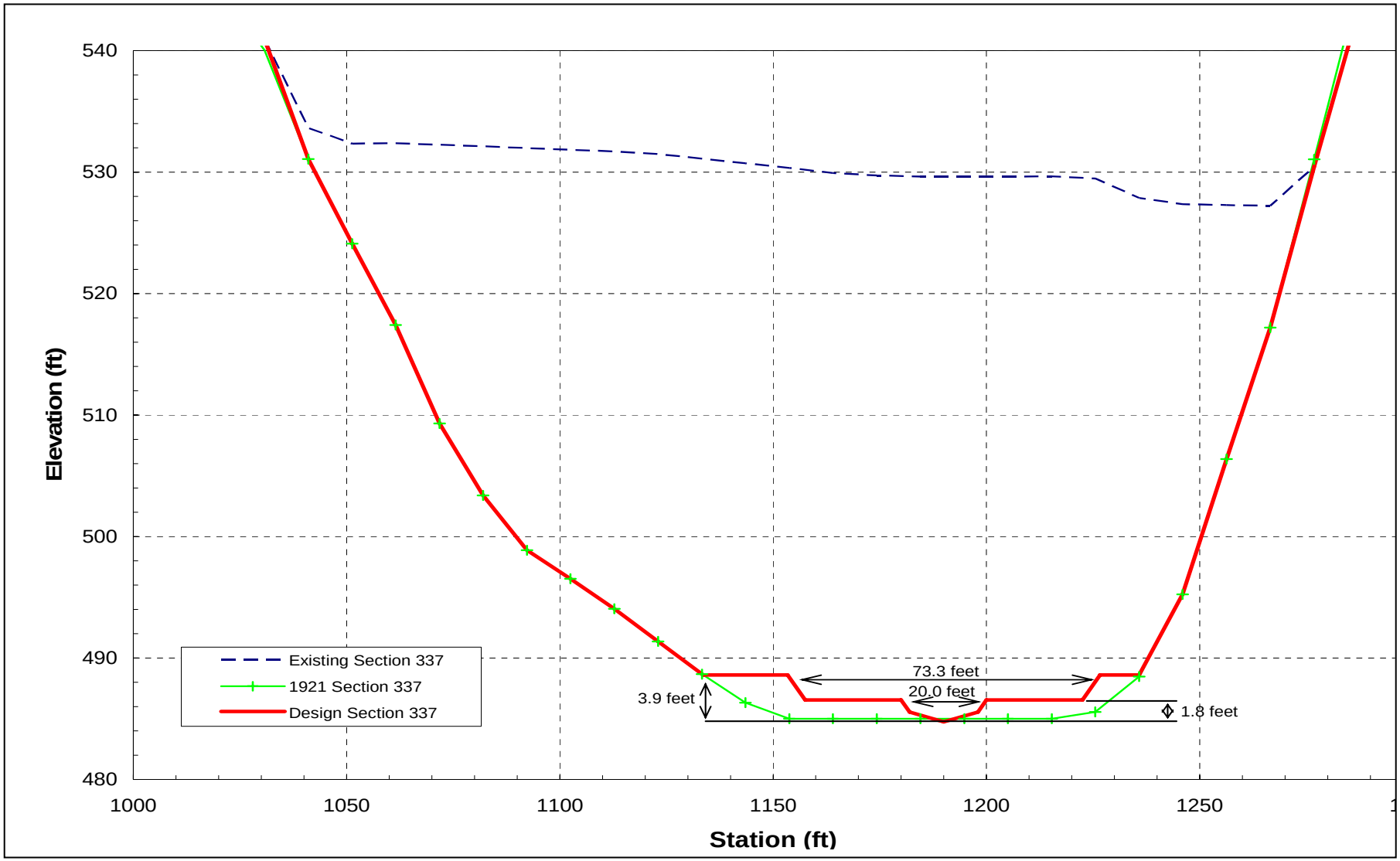


Figure M-4: Typical Cross Section for the Alternative 2 (Dam Removal) in the San Clemente Creek Arm

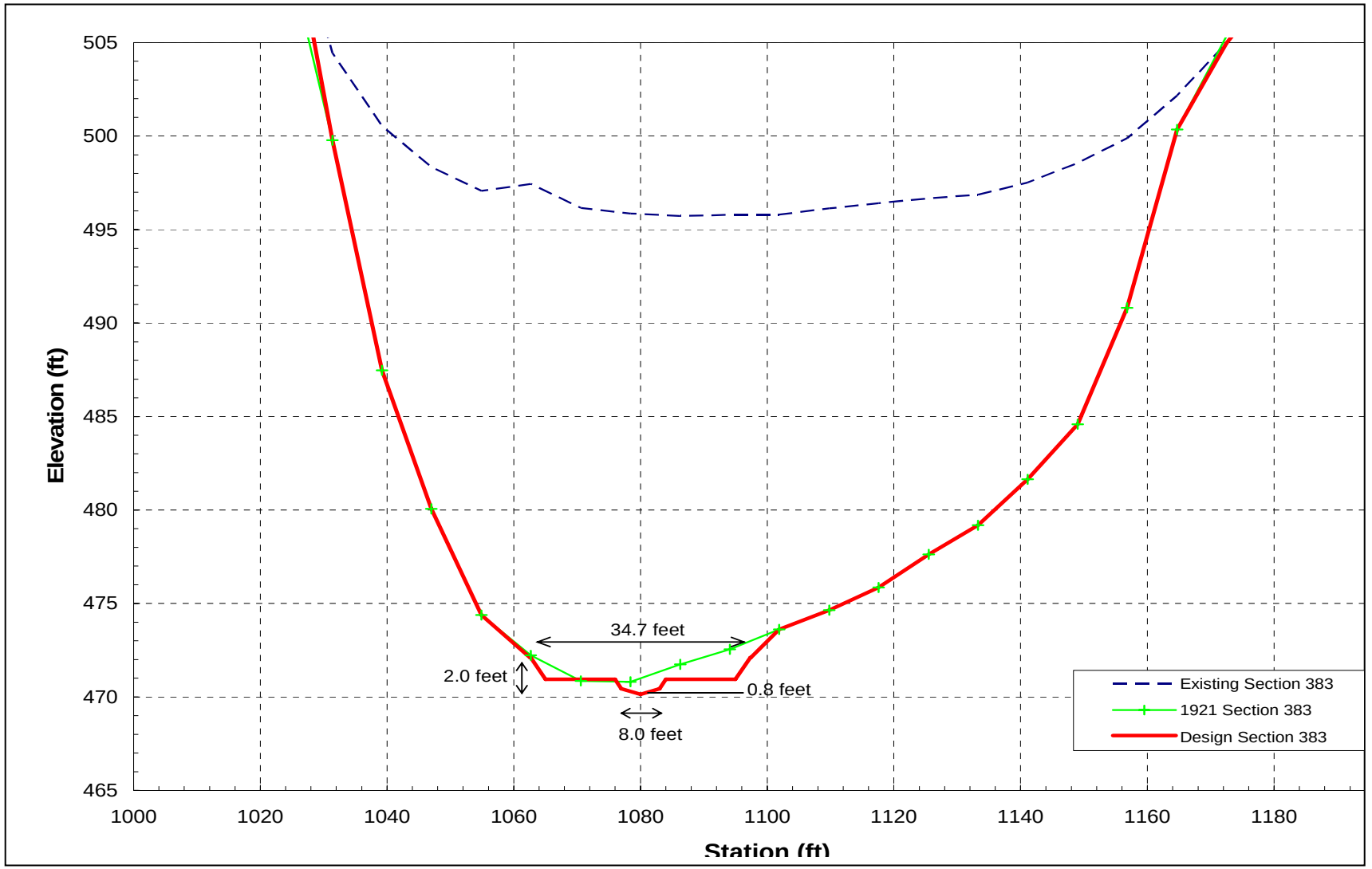


Figure M-5: Typical Cross Section for the Alternative 3 (Carmel River Bypass) in the San Clemente Creek Arm

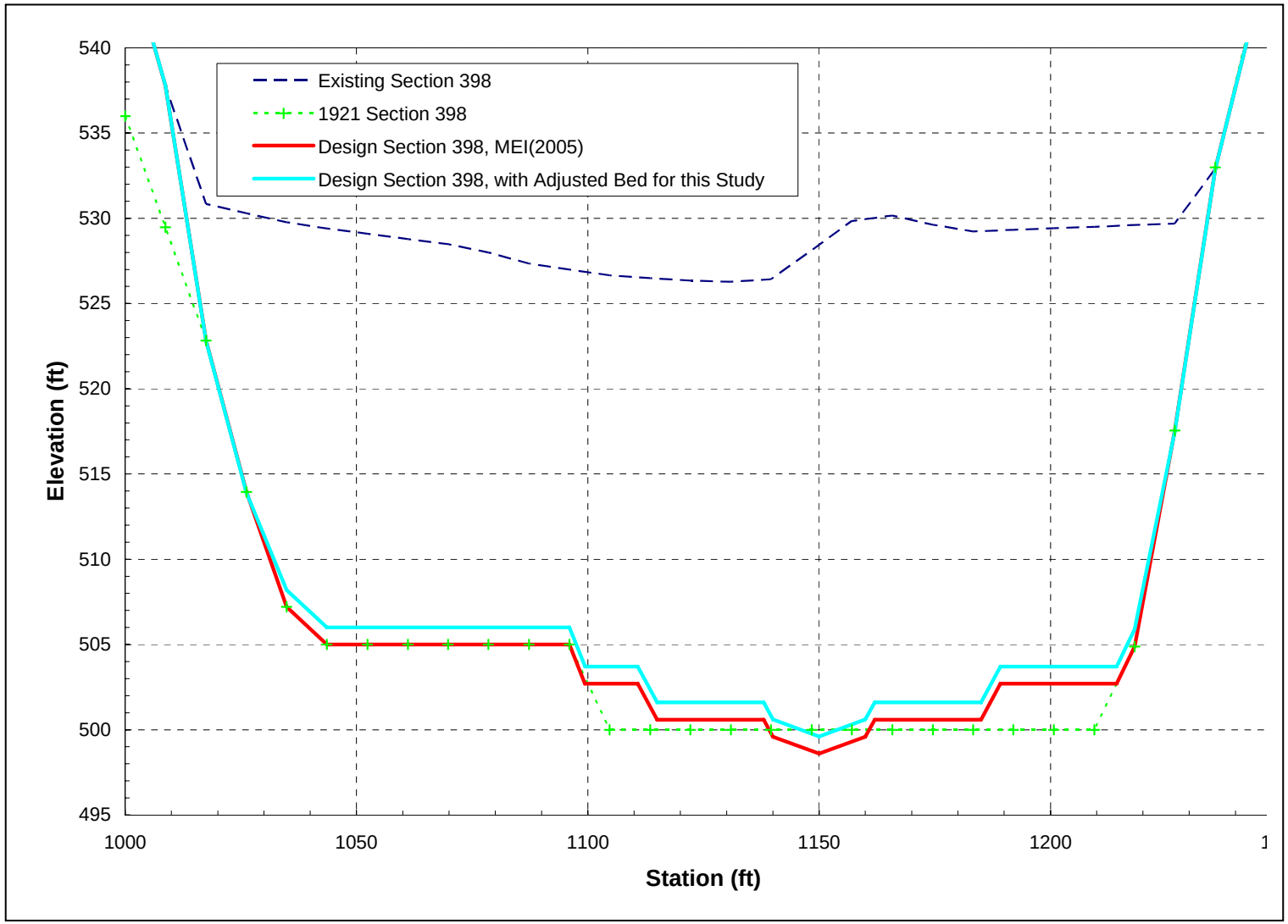


Table M-1: Summary of Subreaches Used in the Sediment Transport Modeling

Subreach Number	Description	Upstream Station	Downstream Station	Subreach Length		Average Gradient		Bed Size Material		Model Cross Sections
		(ft)	(ft)	(ft)	(miles)	(ft/ft)	(ft/mile)	D_{50}	D_{84}	
4.3	San Clemente Dam to Sleepy Hollow	101,400	92,400	9,000	1.70	0.0099	52.1	203	293	207- 232
4.7	Sleepy Hollow to Tularcitos Creek	92,400	85,800	6,600	1.25	0.0079	41.5	152	227	189 to 206
5	Tularcitos Creek to Hitchcock Canyon	5,800	78,800	7,000	1.33	0.0067	35.3	161	230	168 to 188
6.3	Hitchcock Canyon to Garza Creek	78,800	67,000	11,800	2.23	0.0055	29.0	103	176	142 to 167
6.7	Garzas Creek to Randazzo Bridge	67,000	54,100	12,900	2.44	0.0048	25.4	86	155	115 to 141
7.3	Randazzo Bridge to Robinson Canyon	54,100	42,900	11,200	2.12	0.0035	18.7	75	121	93 to 114
7.7	Robinson Canyon to Schulte Road	42,900	35,400	7,500	1.42	0.0029	15.1	53	88	77 to 92
8.3	Schulte Road to Valley Green Bridge	35,400	25,400	10,000	1.89	0.0025	13.2	38	65	55 to 76
8.7	Valley Green Bridge to Highway 1	25,400	5,900	19,500	3.69	0.0021	11.2	1.8	6.2	14 to 54
9	Highway 1 to mouth	5,900	0	5,900	1.12	0.0009	4.5	1.5	4.9	0.5 to 13
			Total Length	**101,400**	**19.2**					

Source: MEI 2007a

SEDIMENT TRANSPORT EVALUATION CRITERIA

Three evaluation criteria were applied to the output of sediment transport modeling: reservoir sedimentation, sediment loading, and downstream sediment concentration.

Reservoir Sedimentation

Reservoir sedimentation was evaluated from the simulated total sediment load retained in the reservoir and also by the reservoir trap efficiency. The 41-year simulation is used for this analysis. Trap efficiency refers to the amount of sediment entering the reservoir that is trapped within the reservoir area. The computation is based on the long-term simulation of sediment transport through the reservoir. The trap efficiency was estimated by summing the total sediment retained in the reservoir area divided by the total sediment inflow to the reservoir. In recent years the trap efficiency was about 75 percent but declines to about 35 percent as the reservoir fills.

Reservoir sedimentation was assessed for sluicing under the Proponent's Proposed Project, using a one-year simulation as explained above.

Over the long term, sedimentation of the reservoir may be affected by unanticipated events such as wildfires or landslides. Such events can produce large amounts of sediment that enters the river and moves downstream to the reservoir. These events occur randomly and therefore no modeling was performed for them.

Downstream Sediment Loading

The sediment transport modeling simulated the total amount of sediment passing the dam to the lower river for the 41-year simulation period under the four alternatives, and includes sediment grain size distribution.

Downstream sediment loading was also assessed for sluicing under the Proponent's Proposed Project. Simulations were performed for the change in channel bed elevation as a result of the downstream sediment loading.

Downstream Sediment Concentration

Using the modeled sediment loading results, MEI estimated suspended sediment concentrations in the lower river water column. Suspended sediment concentrations were estimated from 0.5 feet above the river bed to the water surface. Results were presented for the river reaches described in Section 4.2 of the Final EIR/EIS (Hydrology, Table 4.2-3).

Suspended sediment concentrations were also assessed for sluicing under the Proponent's Proposed Project.

Appendix N

SUMMARY OF HYDRAULIC AND SEDIMENT-TRANSPORT ANALYSIS OF RESIDUAL SEDIMENT: ALTERNATIVES FOR THE SAN CLEMENTE DAM REMOVAL/RETROFIT PROJECT, CALIFORNIA

Summary of Hydraulic and Sediment-transport Analysis of Residual Sediment: Alternatives for the San Clemente Dam Removal/Retrofit Project, California

March 19, 2007

1. INTRODUCTION

Mussetter Engineering, Inc. (MEI) was retained by MWH Americas, Inc. (MWH) to perform an evaluation of the potential effects to the downstream river of residual sediment that would remain in the valley bottom during implementation of the Carmel River Bypass (**Figure 1**), Complete Removal and Dam Notching (**Figure 2**) Alternatives for the San Clemente Dam Removal/Retrofit project.

The baseline effects of the Bypass Alternative were evaluated in a previous study (MEI, 2005) under the assumption that all of the sediment deposits in the relevant portion of the reservoir would be excavated prior to removal of the dam. In practice, a portion of the existing deposits would likely remain in the valley bottom under either of the Complete Dam Removal or Bypass Alternatives because it is not practical to remove all of the sand from the pre-existing, coarse-grained bed material. In addition, depending on the actual design of either of these alternatives, it may be more practical to intentionally leave a limited amount of the existing deposits to provide material within which the reconstructed channel can adjust, rather than completely pre-forming the channel to the desired dimensions.

For the Dam Notching Option, the profile on the sediment deposits after excavation would intersect the pre-dam profile about one mile upstream from the dam in the Carmel River Branch and about 2,000 feet upstream from the dam in the San Clemente Creek Branch, assuming that the gradient across the remaining deposits after excavation is the same as the existing reservoir gradient (**Figures 3 and 4**). In the portion of the reach upstream from this intersection, the residual sediment issues will be similar to those for the Bypass and Complete Removal Alternatives. The sediment deposits beneath the reconstructed channel in the reach between the dam and the intersection with the pre-dam profile will be significantly finer than in the up- and downstream river, which will affect the transport rates and downstream sediment delivery.

Based on the above discussion, the following tasks were conducted to analyze the effects of the residual sediment under each of the three alternatives:

Carmel River Bypass Option

a. The HEC-6T sediment-routing model that was used to evaluate the Carmel River Bypass Option (MEI, 2005) was modified to reflect a residual sediment depth of 1.0 feet across the valley bottom.

b. Consistent with the previous modeling studies, the modified model was run with both the 1985 (dry starting period) and 1978 (wet starting period) hydrology.

Complete Dam Removal Option

a. Cross-sectional geometry was developed for appropriately sized, reconstructed channels in both the Carmel River and San Clemente Creek branches of the reservoir, with the channel profile at approximately the pre-dam elevations. A one-dimensional (1-D) step-backwater model of each reach was developed to evaluate the hydraulic conditions in the reconstructed reaches, and the resulting cross-sectional geometry was integrated into the HEC-6T sediment-routing model.

b. The HEC-6T sediment-routing model was modified to reflect the reconstructed channel geometry with a residual sediment depth of 1.0 feet.

c. The modified model was run for both the 1985 (dry starting period) and 1978 (wet starting period) hydrology.

Dam Notching Option

a. Cross-sectional geometry was developed for appropriately sized, reconstructed channels in both the Carmel River and San Clemente Creek branches of the reservoir, with the channel dimensions and gradient in the reach between the dam and the intersection with the pre-dam profile in each branch established to convey the inflowing baseload, and the profile upstream from that point at approximately the pre-dam elevations. This task included development and refinement of a 1-D step-backwater model of each reach to evaluate the hydraulic conditions in the reconstructed channels.

b. The HEC-6T sediment-routing model was modified to reflect the reconstructed channel geometry, with a residual sediment depth of 1.0 feet in the reaches upstream from the intersection of the excavated profile and the pre-dam bed elevations.

c. The modified model was run for both the 1985 (dry starting period) and 1978 (wet starting period) hydrology.

Results from each of the above described model runs were summarized and interpreted.

2. HYDRAULIC ANALYSIS

2.1. Model Development

A hydraulic analysis was performed to aid in developing appropriate profiles and cross-sectional shapes for the diversion channel and reconstructed reaches of the Carmel River and San

Clemente Creek under the Complete Dam Removal and Notching Alternatives, and the results were assessed to evaluate the hydraulic conditions and capacity of the resulting channels. The hydraulic analysis was performed using the U.S. Army Corps of Engineers' one-dimensional (1-D) HEC-RAS step-backwater program, Version 3.1.3 (USACE, 2005).

2.1.1. Complete Dam Removal Alternative

Model topography for the reconstructed reaches of San Clemente Creek and the Carmel River was estimated based on the pre-dam (1921) 5-foot contour-interval mapping, under the assumption that the majority of the existing sediment deposits could be removed. The resulting slope is about 1.2 percent in the Carmel River Branch and about 2.5 percent in the San Clemente Creek Branch (**Figures 5 and 6**).

The cross-sectional geometry for the reconstructed channel was developed to convey between the 1.5- and 2-year peak discharges in each branch. Consistent with the original Carmel River Bypass Option design geometry (MEI, 2005), a two-stage, compound channel form was selected. The geometry in the Carmel River Branch includes a 20-foot wide, 1.8-foot deep low-flow channel and a 73-foot wide high-flow channel with an overall depth of 3.9 feet (**Figure 7**). In the San Clemente Creek Branch, the geometry includes an 8-foot wide, 0.8-foot deep low-flow channel and a 35-foot wide high-flow channel with an overall depth of 2.0 feet (**Figure 8**). The capacity of the low-flow channel is approximately 130 cfs and the capacity of the bankfull channel is approximately 1,330 cfs in the Carmel River branch, and the corresponding capacities in the San Clemente Creek branch are 20 and 318 cfs, respectively.

The cross-sectional geometry was inserted into the existing conditions model that was developed in MEI (2005) and executed over a range of flows including:

- the median flow at San Clemente Dam (15 cfs),
- the 2-year peak discharge (2,250 cfs),
- the maximum mean daily flow in the 41-year period of record from the CVSIM model (8,468 cfs),
- the 100-year peak discharge (22,700 cfs), and
- the probable maximum flood (PMF) that was estimated by CDWR to have a peak discharge of 81,200 cfs.

A roughness value (Manning's *n*) of 0.035 was used for the main channel in the reconstructed reach of San Clemente Creek, and an *n*-value of 0.08 was used in the portion of the cross section that extends across the re-constructed floodplain to the valley wall under the assumption that vegetation will colonize the floodplain within a few years after construction.

2.1.2. Dam Notching Alternative

Under the Dam Notching Alternative, the profile on the sediment deposits after excavation will intersect the pre-dam profile about one mile upstream from the dam in the Carmel River Branch and about 2,000 feet upstream from the dam in the San Clemente Creek Branch, assuming that the gradient across the remaining deposits after excavation is the same as the existing reservoir gradient (Figures 3 and 4). In the portion of the reach upstream from this intersection, the residual sediment issues will be similar to those for the Bypass and Complete Removal Alternatives.

Consistent with the Bypass and Complete Dam Removal Alternatives, a two-stage channel was used to maintain reasonable flow depths and velocities over the range of flows. The channel in the Carmel River Branch includes a 20-foot wide, 1.8-foot deep low-flow channel bounded by a 76-foot wide high-flow channel with an overall depth of 4.5 feet (**Figures 9 and 10**). The bankfull capacity of the channel in the portion of the reach upstream from the intersection of the pre-dam surface is about 1,930 cfs approximately the 2-year flood peak and the low flow channel will convey about 130 cfs, and the bed-material transport capacity significantly exceeds the inflowing sediment load (**Figures 11 and 12**). Between the intersection and the dam, the low-flow channel capacity is about 35 cfs and the bankfull capacity only about 530 cfs due to the flatter slope. With this geometry, however, the transport capacity matches the inflowing sediment load very closely, indicating that the main channel in this reach will not significantly aggrade or degrade. The channel in this portion of the reach will eventually adjust to the 1.5- to 2-year peak by deepening as the overbanks continue to aggrade during the relatively frequent overbank flows.

The compound channel in the San Clemente Creek Branch includes an 8-foot wide, 0.8-foot deep low-flow channel bounded by a 35-foot wide high-flow channel with an overall depth of 2.0 feet (**Figure 13**). The capacities of the low flow and bankfull channels downstream from the intersection with the pre-dam surface are about 8 and 120 cfs, respectively, increasing to 20 and 320 cfs, respectively, in the upstream reach.

To establish the gradient of the channel across the remaining reservoir deposits under this alternative, it was assumed that the floodplain of the reconstructed channel will coincide with the crest elevation of the notch (506 feet), with the channel invert below the dam crest (Figure 3). To accommodate this configuration, a 4.5-foot deep by 30-foot wide low-flow notch will be cut into the lowered dam to convey the 2-year peak flow of 2,250 cfs under critical depth conditions.

2.2. Hydraulic Model Results

2.2.1. Complete Dam Removal Alternative

Under the Complete Dam Removal Alternative, the computed water-surface profiles in the Carmel River Branch indicate that the valley constriction in the vicinity of the existing dam causes a relatively significant backwater effect at flows greater than the 2-year peak (**Figure 14**). The backwater extends about 600 feet upstream from the constriction in the Carmel River branch and about 1,300 feet upstream in the San Clemente Creek branch at the 100-year discharge (**Figure 15**). The analysis also indicates that hydraulic jumps will occur at discharges greater than the 2-year event at other locations where the valley constricts the flow, causing a localized increase in energy slope. If this alternative is ultimately selected, it may be possible to eliminate some of these jumps at moderate flows in the 2- to 50-year range by adjusting the channel configuration and profile during the detailed design phase. At higher flows, the valley configuration controls the jumps, and it will probably not be possible to eliminate them. Given the infrequency of flows in this range, this is not considered to be a serious limitation of the Bypass option.

The model results indicate that average velocities in the reconstructed reach of the Carmel River Branch will range from about 2.4 fps at the median flow of 15 cfs to about 9 fps at the 2-year peak discharge of 2,250 cfs (combined Carmel River and San Clemente Creek flows)

(**Figure 16, Table 1**). Flow conditions at the 2-year peak are near-critical or supercritical. At the 100-year peak discharge, average main channel velocities are about 11.7 fps in areas with subcritical flow, but range up to 20.1 fps in supercritical areas. In the San Clemente Creek Branch, the average velocity is 1.7 fps at the median flow, increasing to 6.6 fps at the 2-year event and 10.7 fps at the 100-year event (**Figure 17**). Although the high velocities are expected given the relatively steep gradient of the reach, constraints on fish passage should be considered in the design phase.

Table 1. Summary of average hydraulic parameters under the Complete Dam Removal Option for the median flow, the 2-year peak discharge, the 100-year peak discharge, and the PMF.

Flow	Discharge at Existing Dam (cfs)	Carmel Branch				San Clemente Creek Branch			
		Main Channel Velocity* (ft/s)	Hydraulic Depth* (ft)	Top Width* (ft)	Energy Grade* (ft/ft)	Main Channel Velocity* (ft/s)	Hydraulic Depth* (ft)	Top Width* (ft)	Energy Grade* (ft/ft)
Median Flow	15	2.5	0.4	15.1	0.01299	1.7	0.1	4.9	0.0264
1.5-year Peak	1,193	7.7	2.1	73.0	0.01240	5.7	1.0	33.5	0.0199
2-year Peak	2,250	9.1	2.5	90.9	0.01192	6.6	1.2	46.2	0.0166
100-year Peak	22,700	16.6	9.2	206.3	0.00532	10.7	4.6	99.4	0.0080
PMF	81,200	20.7	22.2	309.5	0.00313	11.8	15.3	169.8	0.0044

*Includes sections with supercritical flow.

2.2.2. Dam Notching Alternative

Under the Dam Notching Alternative, hydraulic conditions are similar to the Complete Dam Removal Alternative in both branches upstream from the intersection with the pre-dam surface, since the design geometries and channel profiles are similar. Downstream from the intersection, however, the significantly flatter slopes result in increased flow depths and top widths, and decreased velocities and energy gradients (**Figures 18 and 19, Table 2**). In the San Clemente Creek Branch, the backwater effects from the Carmel Branch extend about 200 feet upstream from confluence with the Carmel River at the 2-year peak flow, and about 2,000 feet upstream at the 100-year peak (Figure 19).

Downstream from the intersection in both braches, main channel velocities are relatively consistent at flows less than the 2-year event, when the flow is constrained to the reconstructed channel, but at flows greater than the 2-year event, constrictions in the valley cause locally high velocities (**Figures 20 and 21**). At the 2-year event, the average main channel velocity on the remaining reservoir deposits is about 4.0 fps in the Carmel River branch and about 3.4 fps in the San Clemente Creek Branch, increasing to 8.9 and 7.1 fps in the reaches upstream from the intersection with the pre-dam profile. Average main channel velocities downstream from the intersection for the 100-year event are about 9.1 and 3.6 fps in the Carmel River and San Clemente Creek Branches, respectively, increasing to 18.5 and 15.0 fps upstream from the intersection.

Table 2. Summary of average hydraulic parameters under the Notching Option for the median flow, the 2-year peak discharge, the 100-year peak discharge, and the PMF.

Flow	Discharge at Existing Dam (cfs)	Main Channel Velocity* (ft/s)	Hydraulic Depth* (ft)	Top Width* (ft)	Energy Grade* (ft/ft)	Main Channel Velocity * (ft/s)	Hydraulic Depth* (ft)	Top Width * (ft)	Energy Grade* (ft/ft)
		Carmel River Branch (Upstream)				**Carmel River Branch (Downstream)**			
Median Flow	15	2.6	0.4	14.9	0.0164	1.1	0.8	17.6	0.0010
1.5-year Peak	1,193	7.5	2.1	75.1	0.0136	3.5	2.0	274.8	0.0012
2-year Peak	2,250	8.9	2.7	83.0	0.0133	4.0	3.0	279.5	0.0011
100-year Peak	22,700	18.5	7.9	208.8	0.0094	9.1	13.5	321.5	0.0013
PMF	81,200	24.1	17.0	340.9	0.0064	13.7	27.8	403.1	0.0012
		San Clemente Creek (Upstream)				**San Clemente Creek (Downstream)**			
Median Flow	15	1.6	0.1	5.0	0.0288	0.9	0.2	6.1	0.0049
1.5-year Peak	1,193	5.8	0.9	33.4	0.0252	3.2	0.6	172.5	0.0037
2-year Peak	2,250	7.1	1.0	48.7	0.0249	3.4	1.1	175.1	0.0029
100-year Peak	22,700	15.0	3.3	80.6	0.0243	3.6	8.3	209.9	0.0006
PMF	81,200	19.0	9.5	107.9	0.0134	4.7	20.1	274.8	0.0002

3. SEDIMENT-TRANSPORT ANALYSIS

The sediment-transport modeling for this study was performed using modified versions of the earlier HEC-6T models that were developed for MEI (2005). The following sections describe the model modifications and results.

3.1. Model Development

The following three scenarios were modeled for this study:

Scenario 1: the Carmel River Bypass Alternative,
Scenario 2: the Complete Dam Removal Alternative, and,
Scenario 3: the Dam Notching Alternative.

The model for each alternative was developed by substituting the cross sections discussed in the previous section into the appropriate locations in the existing conditions geometry file. No changes were made to the portion of the model that represents the river downstream from the dam for any of the scenarios. Consistent with the previous studies, two hydrologic scenarios were evaluated for each scenario to represent wet and dry conditions immediately after removal of the dam (1978 and 1985 start-dates, respectively).

3.1.1. Carmel River Bypass Alternative Model Development

The model geometry for the Carmel River Bypass Alternative was similar to the model geometry in MEI (2005), except that the channel bed geometry was adjusted in the reconstructed (Bypass) reach of San Clemente Reservoir by adding 1 foot of elevation to the cross section points located between the valley walls to account for the residual sediment (**Figure 22**). The sediment size-gradation in the 1-foot deep BSR between the diversion channel outlet and the dam was estimated based on the gradations for Zones 9A, 11, and 2A from MEI (2003) (**Figures 23 and 24**). Upstream from the diversion channel in the Carmel River Branch, the cross-sectional geometry and sediment gradation in the BSR was the same as that used in the MEI (2005) model. Consistent with the previous study, the portion of the Carmel River Branch that would remain in permanent storage below the diversion channel was not included in the model.

3.1.2. Complete Dam Removal Alternative Model Development

The model for the Complete Dam Removal Alternative was developed by inserting the cross-sectional geometry for both branches of the reservoir that was developed for this alternative (Section 2.1.1) into the existing conditions model. The geometry of the channel bed was then adjusted by adding 1 foot of elevation to the cross section points located between the valley walls to account for the residual sediments that would likely remain after excavation. The existing dam was removed from the model, and a BSR with a depth of 1-foot was added to the bottom of the model. The gradation of the BSR sediments in the Carmel Branch was based on Zones 9, 5, 3, 1, and 12, and Zones 9A, 11, 2A, and 1A in the San Clemente Creek Branch (Figures 23 and 24, **Figure 25**).

3.1.3. Dam Notching Alternative Model Development

The cross-sectional geometry for the Dam Notching Alternative Model was developed in a similar manner to the Complete Dam Removal Alternative by inserting the new geometry, as appropriate (Section 2.1.2), and adjusting the cross sections in the reach upstream from the intersection with the pre-dam surface to include an additional one foot of elevation along the channel bed to account for the residual sediment. Downstream from the intersection with the pre-dam profile, the BSR includes the portion of the reservoir deposits that will remain below the notched dam. The geometry of the dam was adjusted by lowering the crest to an elevation of 506 feet and adding the 30-foot wide, 4.5-foot deep low flow notch to tie into the assumed geometry of the upstream reconstructed channel. Based on the profiles shown in Figures 23 and 25, the gradation of the BSR was adjusted to include Zones 8, 5, 3, 1 and 12 in the Carmel River Branch, and Zones 10, 2A and 1A in the San Clemente Creek Branch.

3.2. Reservoir Model Results

Results from the sediment-transport models were evaluated to determine the effects of the alternatives on the timing, volume, and distribution of sediments evacuated from the reservoir and deposited in the downstream Carmel River. Potential impacts were evaluated by comparing results from each of the alternatives with results from the baseline (with dam) conditions model that was presented in MEI (2005) that represents the no-action or dam-thickening alternatives. The results from the Carmel River Bypass Alternative were also

compared to the Bypass Alternative with no BSR from MEI (2005) to assess the effects of the residual sediments.

3.2.1. Carmel River Bypass Alternative

The general direction and magnitude of the predicted responses for the Carmel River Bypass Alternative are very similar to those from the earlier study (Carmel River Bypass Alternative with no BSR), but there are differences that are important to interpretation of the effects of the BSR for the other alternatives evaluated in this study. The total volume of sediment passing the existing dam location at the end of the 41-year simulation is about 556 ac-ft for the flow sequence with the 1985 start-date and about 576 ac-ft for the 1978 start date (**Figures 26 and 27**). This represents an increase of 12 to 15 ac-ft over the results from the previous model with no BSR. Because the HEC-6T program interprets the BSR as the depth below the cross section thalweg elevation to which any point along the cross section can erode, it is possible for more than one foot of erosion to occur outside of the low-flow channel (**Figure 28**). This interpretation of the BSR is believed to reasonably reflect conditions after excavation to the pre-dam surface that will likely include areas where the residual sediments are more than 1 foot deep, or where the pre-dam surface included fine-grained alluvial deposits.

The total load passing the existing dam location is 12 percent (1985 start date) to 14 percent (1978 start date) higher than under baseline conditions. Most of the increase occurs in the gravel and cobble size-ranges, with a volume of about 70 ac-ft under both start dates compared to about 23 ac-ft under baseline conditions (**Figure 29**). This indicates that about 77 percent of the inflowing gravel would be transported to the existing dam location, compared to 25 percent under baseline conditions. The results also indicate that 97 ac-ft (1978 start date) to 117 ac-ft (1985 start date) of additional sediment is stored in the reservoir upstream from the existing dam location (**Figures 30 and 31**). Despite net storage, 15 ac-ft (1985 start date) to 28 ac-ft (1978 start date) of material is eroded from the residual sediments in the reconstructed reach of San Clemente Creek, and therefore, between 128 and 132 ac-ft is stored on the Carmel River delta upstream from the diversion channel.

3.2.2. Complete Dam Removal Alternative

Results from the Complete Dam Removal Alternative indicate that this option has the largest impact on sediment loading to the downstream river, with about 670 ac-ft of total load passing the dam at the end of the 41-year simulation with both start dates (Figures 26 and 27). This represents a 30 percent increase over baseline conditions. The majority of the increase occurs in the coarse sand and gravel size ranges, with about 380 ac-ft of medium to coarse sand and 104 ac-ft of gravel (Figure 29). This indicates that all of the inflowing sand and gravel is transported to the existing dam location, and an additional 13 ac-ft of gravel is entrained from the upstream portion of the delta and transported to the location of the existing dam, representing an increase of about 14 percent over baseline conditions. The increased loading at the location of the existing dam is primarily due to the removal of the flat portions of the delta and the relatively large amount of residual sediment that is exposed in the reconstructed channel bed and overbanks in the Carmel River Branch. As expected, the amount of sediment stored in the existing reservoir is significantly less than under the other alternatives, with only about 3 ac-ft (1985 start date) to 4 ac-ft (1978 start date) of material that is primarily stored in the overbanks of the reconstructed channel in areas where the valley widens and the energy gradient flattens at higher flows.

3.2.3. Dam Notching Alternative

Results from the Dam Notching Alternative indicate that the total load passing over the reconfigured dam during the 41-year simulation period is similar to the Carmel River Bypass Alternative [573 ac-ft (1985 start date) to 585 ac-ft (1978 start date)] (Figures 24 and 25). The primary difference in the sediment loading over the notched dam is an increase in the amount of fine material and a decrease in the amount of gravel. Under the Dam Notching Alternative, 197 ac-ft (1985 start date) to 201 ac-ft (1978 start date) of very fine to fine sand is delivered over the dam, compared to 172 to 178 ac-ft of this material under the Bypass Alternative. The volume of gravel passing the dam is 55 ac-ft (1978 start date) to 59 ac-ft (1985 start date), compared to about 70 ac-ft under the Bypass Alternative. These gravel volumes represent 60 percent (1978 start date) to 65 percent (1985 start date) of the inflowing gravel. The increased fine material loads and the decreased gravel loads passing over the dam result from the reduced gradient and transport capacity of the reconstructed reaches downstream from the intersection with the pre-dam surface. The increase in fine sediment loading results in an overall reduction in the amount of material trapped in the reservoir [100 ac-ft (1985 start date) to 89 ac-ft (1978 start date), compared to 97 to 117 ac-ft under the Bypass Alternative, and 177 to 168 ac-ft under the baseline conditions].

3.3. Model Results for the Carmel River Downstream from the Existing Dam

Potential impacts of the alternatives on the river downstream from the dam were assessed based on the magnitude of sediment storage along the reach and the resulting changes in bed elevation, the effects of these changes on flood potential, and the volume of gravels that remain in storage within the main channel. The evaluations were performed on a reach-by-reach basis using the 10 subreaches that were identified in MEI (2002a) (**Table 3**).

3.3.1. Sediment Storage Volumes

Under the Bypass Option with one foot BSR to account for the residual sediment in the reconstructed reach of San Clemente Creek, the maximum increase in the total volume of sediment stored in the river during the simulation period is about 19 ac-ft, occurring in the sixth year of the simulation for the 1978 start date and the eighth year of the simulation for the 1985 start date (**Figures 32 and 33**). For the 1978 start date, the curves in Figure 32 for the Bypass Alternative (with and without the BSR) are generally parallel after the first 10 years of the simulation, indicating that no additional sediment accumulates in the river after this time. Interestingly, for the 1985 start date (Figure 33), after the initial increase in sediment deposition that occurs in Years 8 through 10, the curves for the Bypass Alternative (with and without the BSR) slowly converge, indicating that the river eventually recovers from the effects of the residual sediments. This difference in the 1978 and 1985 start dates is likely a result of relatively large amounts of coarse material that are deposited in the river at the beginning of the 1978 start-date simulation and armor the channel bed, thereby protecting the underlying finer material. This process does not occur to the same extent under the 1985 start-date simulation. The total volume of material that is deposited in the river at the end of the simulation ranges from 57 ac-ft (1985 start date) to 73 ac-ft (1978 start date), a moderate increase over the baseline (with dam) conditions that represents 10 to 12 percent increase in the load passing the location of the existing dam (**Figure 34**). The distribution of sediment storage along the reach varies significantly, with net degradation in Subreaches 8.3 and 8.7, little or no net degradation or aggradation in Subreaches 6.3 and 6.7, and net aggradation in the remainder of the reach

(**Figures 35a and 35b**). Subreach 9, downstream from Highway 1, is the most strongly aggradational of the subreaches. Of the above storage volumes, 74 percent (1978 start-date) to 79 percent (1985 start-date) is located in the overbanks, and the remainder is in the main channel of the river. The model results also indicate that 2 ac-ft (1978 start-date) to 9 ac-ft (1985 start-date) of gravel is stored in the main channel at the end of the simulation (**Figure 36**). The majority of the gravel is stored in the lagoon area downstream from Highway 1 (Subreach 9) and in the reach between Robinson Canyon and Shulte Road (Subreaches 7.3 and 7.7), while some depletion of gravel occurs between Garzas Creek and Randazzo Bridge (Subreach 6.7) and between Valley Green Bridge and Highway 1 (Subreach 8.7).

As expected, the volume of sediment stored in the river at the end of the simulation is larger under the Complete Dam Removal Alternative (Scenario 2) than under the other alternatives since the trapping effect of the reservoir is completely removed. Under this scenario, 123 ac-ft (1985 start date) to 170 ac-ft (1978 start date) of sediments are stored in the river at the end of the 41-year simulation, or about 18 to 25 percent of the inflowing sediment load passing the location of the existing dam (Figures 32 through 34). The model results indicate that in-channel degradation will occur in Subreach 6.7 for both start-dates (Figures 35a and 35b). Subreaches 8.3 and 8.7 would be essentially in equilibrium, and aggradation will occur in the remaining subreaches. Consistent with the Bypass Alternative (Scenario 1), Subreach 9 is the most strongly aggradational. Because the reconstructed reaches of the reservoir deliver all of the inflowing gravel to the downstream river, the volume of in-channel gravels is higher than the other alternatives, with about 18 ac-ft (1978 start date) to 35 ac-ft (1985 start date) stored in the main channel at the end of the simulation. In spite of the overall increase in gravel storage, there is net depletion of gravel in Subreach 6.7 with both start dates and in Subreach 7.3 with the 1978 start date, and insignificant net change in Subreaches 8.3 and 8.7 (Figure 36).

Under the Notching Alternative, 58 ac-ft (1978 start date) to 60 ac-ft (1985 start date) of total sediment is stored in the river at the end of the simulation, a slight increase over baseline (with-dam) conditions due to the larger volume of coarse material that passes the dam. This represents about 10 percent of the load passing over the notched dam, similar to the percentage under Scenario 1. The distribution of sediment along the reach is also similar to Scenario 1 (Figures 35a and 35b), with generally less aggradation in the upstream three subreaches. For the overall downstream river, about 6 ac-ft (1978 start date) to 7 ac-ft (1985 start date) of additional gravel is stored in the main channel, similar in magnitude and distribution to Scenario 1 but substantially less than under Scenario 2 (Figure 36).

These results indicate that the Complete Dam Removal Alternative would result in more sediment storage in the river over the long-term than would occur under either the Bypass or Dam Notching Alternatives, and the differences between the Bypass Alternative and the Dam Notching Alternative are likely within the uncertainty in the model. In addition, the impacts of each of the alternatives evaluated in this study to the downstream river are relatively small compared to the impacts that would occur under the previously analyzed dam notching and dam removal scenarios (**Figure 37**).

3.3.2. Reach-averaged Bed Elevation Change

As an additional step in understanding the potential effects of the additional sediment storage in the river, the change in mean bed elevation at the end of the 41-year simulation was computed for each of the subreaches using methods described in MEI (2003). As discussed in MEI

(2003), the trends in bed elevation change and in-channel storage along the reach are similar; however, the relative magnitudes are somewhat different due to differences in reach length and channel width from subreach to subreach. Under the Carmel River Bypass Alternative, the largest change in bed elevation occurs in Subreaches 7.3, 7.7, and 9, with increases of between 0.1 and 0.2 feet (**Figure 38**). Average increases of about 0.1 feet also occur in the upstream subreaches (Subreaches 4.3 through 5). The remainder of the subreaches shows a net decrease in mean bed elevation, with average decreases of less than 0.05 feet in Subreaches 6.3, 8.3, and 8.7, and about 0.1 feet in Subreach 6.7.

As expected, the largest changes in bed elevation occur under the Complete Dam Removal Alternative (Scenario 2) because the changes in in-channel sediment storage are greatest under this scenario. The overall change is, however, relatively small, with a distance-weighted average increase of about 0.1 feet over the entire reach. The largest changes occur in the upstream subreaches (Subreaches 4.3, 4.7, and 5), with increases of 0.24 to 0.43 feet at the end of the simulation. Average increases of about 0.2 feet occur in Subreaches 7.3 and 7.7, and Subreaches 6.3 and 9 increases by about 0.15 feet. A net decrease in bed elevation of about 0.11 feet occurs in Subreach 6.7, and the remainder of the subreaches (Subreaches 8.3 and 8.7) show essentially no change in mean bed elevation.

Under the Dam Notching Alternative (Scenario 3), the patterns of aggradation and degradation through the study reach are similar to those under Scenario 1, but the changes are slightly smaller in most areas. Exceptions occur in Subreaches 7.7 and 9, where the increase in mean bed elevation is slightly larger than predicted under Scenario 1.

3.3.3. Effects of Sediment Storage on Flood Conditions

The effects of the indicated aggradation or degradation on flood potential along the reach under each scenario were evaluated by importing the cross sections from the HEC-6T model into a detailed HEC-2 step-backwater model that includes all of the bridges and other hydraulic controls along the reach, running each model with the 100-year peak discharge, and comparing the resulting water-surface profiles. The specific steps that were used in the evaluation were as follows:

1. The year during the simulation when the aggradation impacts on April 1 are largest was identified for each of the 10 subreaches. A separate, modified floodplain model was then developed for the worst-case conditions within each subreach by substituting the cross-sectional geometry from the HEC-6T model for the target year into the existing conditions floodplain model. This resulted in the development of 10 separate models for each HEC-6T model run.

2. The updated floodplain models for each case were then run with the 100-year peak discharge to develop a 100-year water-surface profile for the entire study reach.

3. An envelope water-surface profile incorporating the highest 100-year water-surface elevation at each cross section was then developed, and this envelope profile was compared to the 100-year profile under existing conditions.

The results from this analysis indicate that the flooding impact is about the same and relatively small under the Bypass Option and the Notching Option, and the impact under the Complete

Dam Removal Option is somewhat larger, especially in the upstream subreaches (**Figure 39 and 40**). To aid in comparing results among the alternatives and subreaches, distance-weighted average increase in water-surface elevation were computed for each of the subreaches (**Figures 41 and 42**). The results generally indicate that, under each of the alternatives, the most significant changes from existing conditions occur in the upstream portion of the study reach (Subreaches 4.3, 4.7, and 4.5), with the most significant impacts occurring under the Complete Dam Removal Alternative. Under this scenario, the average change in water-surface elevation ranges from 0.25 to 0.40 feet, with worst-case increases of as much as 2.2 feet in certain locations (Figures 39 and 40). Under the other two alternatives, the maximum increase in water-surface elevation ranges from 0.03 feet (Subreach 5, Dam Notching Alternative, 1985 start date) to about 0.2 feet (Subreach 4.3, Carmel River Bypass Alternative, 1978 start date). Downstream from the Boronda Bridge (Subreaches 6.7 through 9), the worst-case increases in water-surface elevation are relatively small for each of the alternatives (except for the relatively large increase that occurs upstream from Rancho San Carlos Road Bridge), and the differences among the three alternatives are relatively insignificant.

4. SUMMARY AND CONCLUSIONS

This study included an evaluation of the potential effects to the downstream river of residual sediment that would remain in the valley bottom during implementation of the Carmel River Bypass, Complete Dam Removal and Dam Notching Alternatives for the San Clemente Dam Removal/Retrofit project. A variety of analyses were performed to complete this evaluation, including the following:

1. A detailed hydraulic analysis of the design elements in the existing reservoir to identify appropriate dimensions for the reconstructed reaches of the Carmel River and San Clemente Creek under the Complete Dam Removal and Dam Notching Alternatives.

2. Sediment-transport modeling to evaluate the sediment-transport characteristics through the reservoir and impacts to the downstream river for each of the three scenarios, and

3. An additional hydraulic analysis to evaluate the potential effect of changes in sediment storage on flood potential in the downstream river.

The reconstructed channel through the existing reservoir under the Complete Dam Removal Scenario was sized to convey between the 1.5- and 2-year peak discharge. For the Dam Notching Alternative, the selected channel dimensions will convey the 2-year peak discharge upstream from the intersection with the pre-dam surface with transport capacity that exceeds the upstream supply. In the flatter reach across the remaining reservoir deposits, the bankfull capacity is only about 530 cfs, but the transport capacity is approximately in balance with the upstream supply.

Sediment-transport modeling was conducted for each of the three scenarios to determine the pattern of sediment erosion and transport over a simulated 41-year period, both within the existing reservoir and downstream into the Carmel River. The model results generally indicate that the impacts to the downstream river for the Bypass and Dam Notching Alternatives will be similar to those for baseline (with dam) conditions. The impacts from the Complete Dam Removal Option are somewhat greater, but generally on the same order-of-magnitude, as

baseline conditions. Under the Complete Dam Removal Alternative, very little additional sediment would be stored in the reservoir over the 41-year simulation period, compared to nearly 180 ac-ft under the baseline (with dam) conditions (**Figure 43**). The total volume of sediment stored in the downstream river is also relatively small, ranging from 57 ac-ft under the Bypass Alternative to 127 ac-ft under the Complete Dam Removal Alternative.

The impact of the indicated changes in sediment storage on flood potential is also relatively small. Under the Bypass and Dam Notching Alternatives, average changes in 100-year water-surface elevation of 0.1 to 0.2 feet occur in the portion of the reach upstream from Rosie's Bridge, but increase to between 0.2 and 0.4 feet under the Complete Dam Removal Alternative. The differences in water surface in the downstream portions of the reach are considerably smaller, with average changes of less than 0.1 feet for the Bypass and Dam Notching Alternatives, and less than about 0.15 feet for the Complete Dam Removal Alternative.

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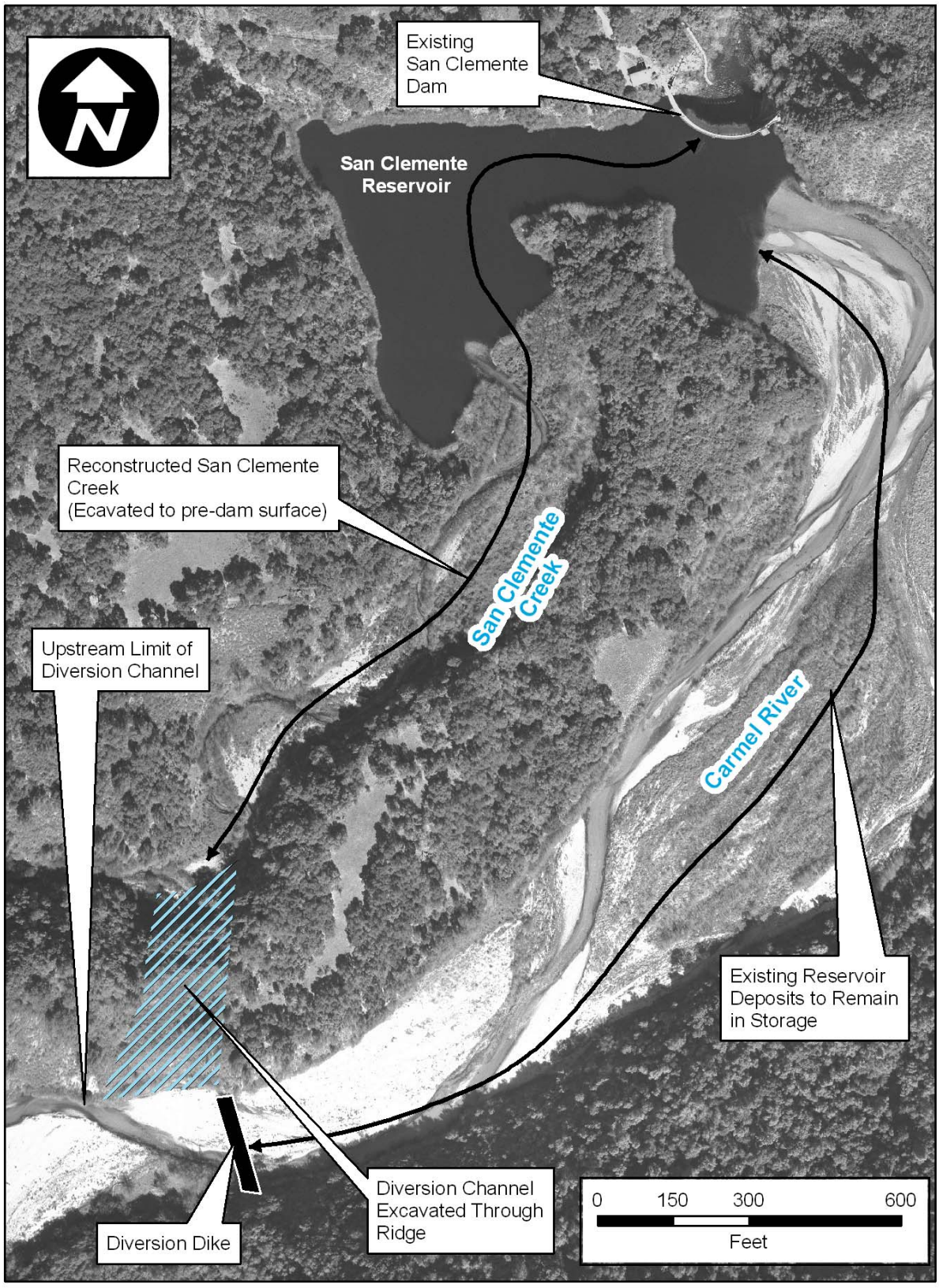


Figure 1. Proposed elements of the Carmel River Bypass Alternative.

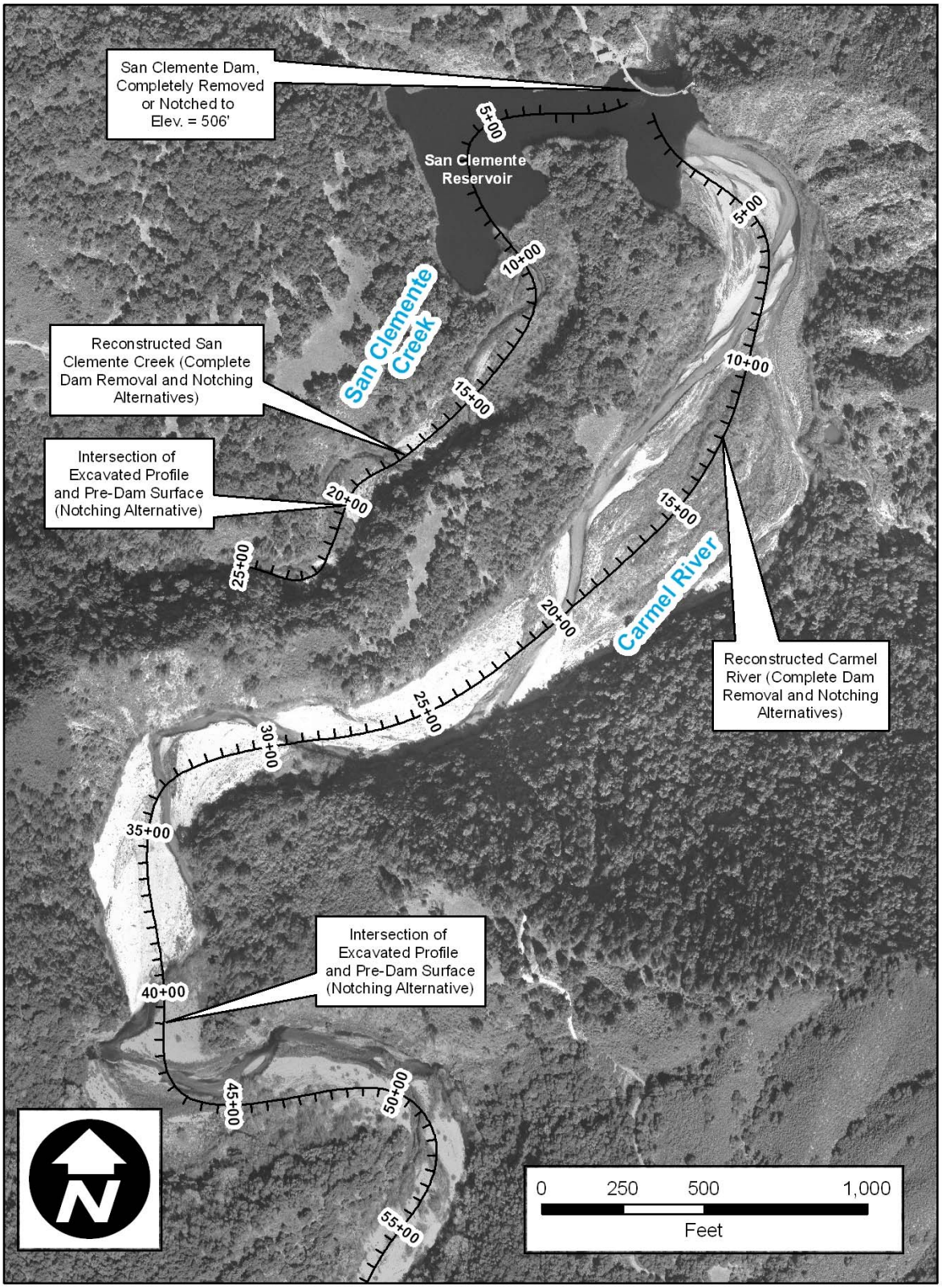


Figure 2. Proposed elements of the Complete Dam Removal and Dam Notching Alternatives.

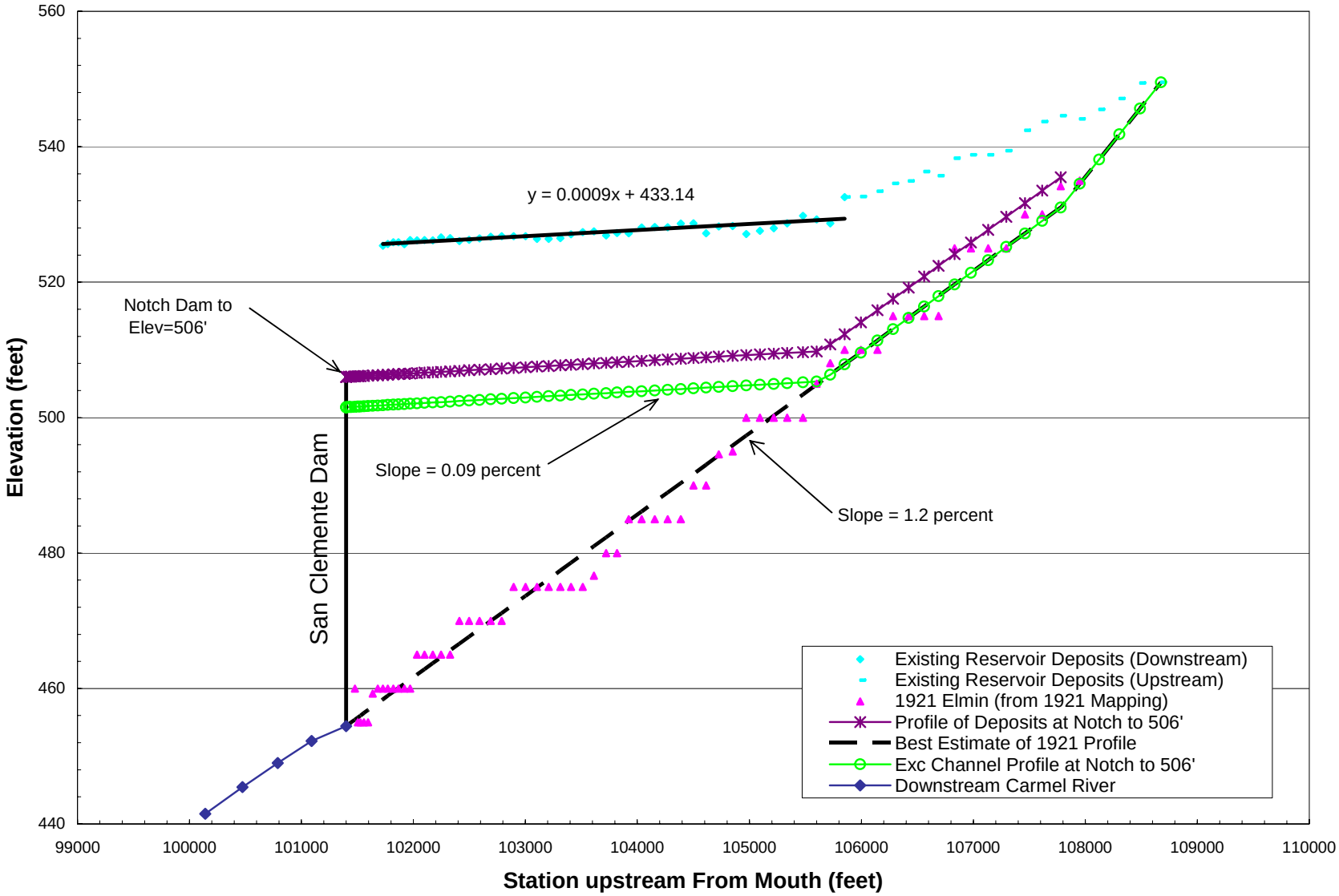


Figure 3. Longitudinal profile of the existing reservoir deposits, the pre-dam surface, and the constructed profile under the Notching Alternative in the Carmel Branch of San Clemente Reservoir.

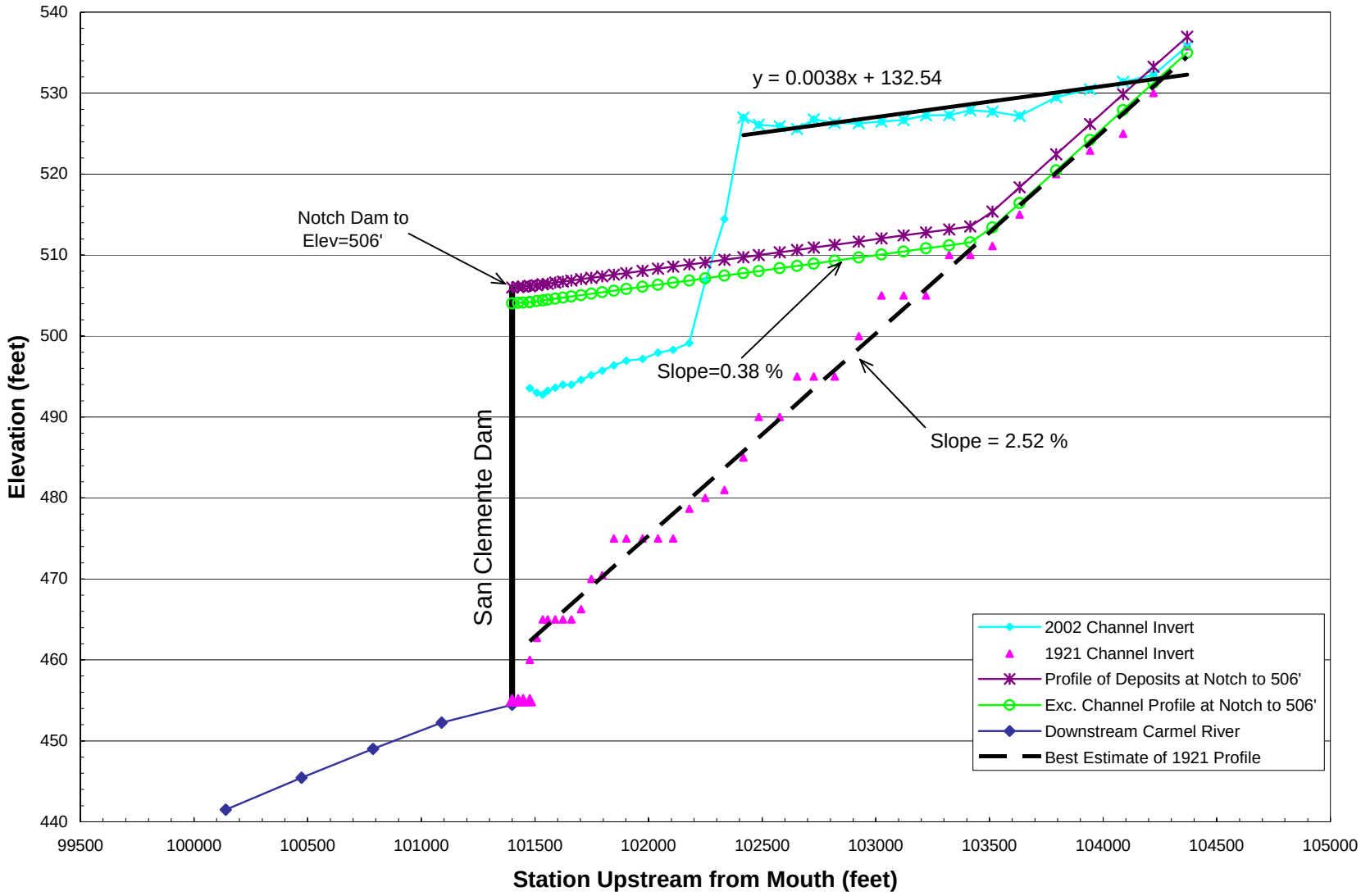


Figure 4. Longitudinal profile of the existing reservoir deposits, the pre-dam surface, and the constructed profile under the Notching Alternative in the San Clemente Creek Branch of San Clemente Reservoir.

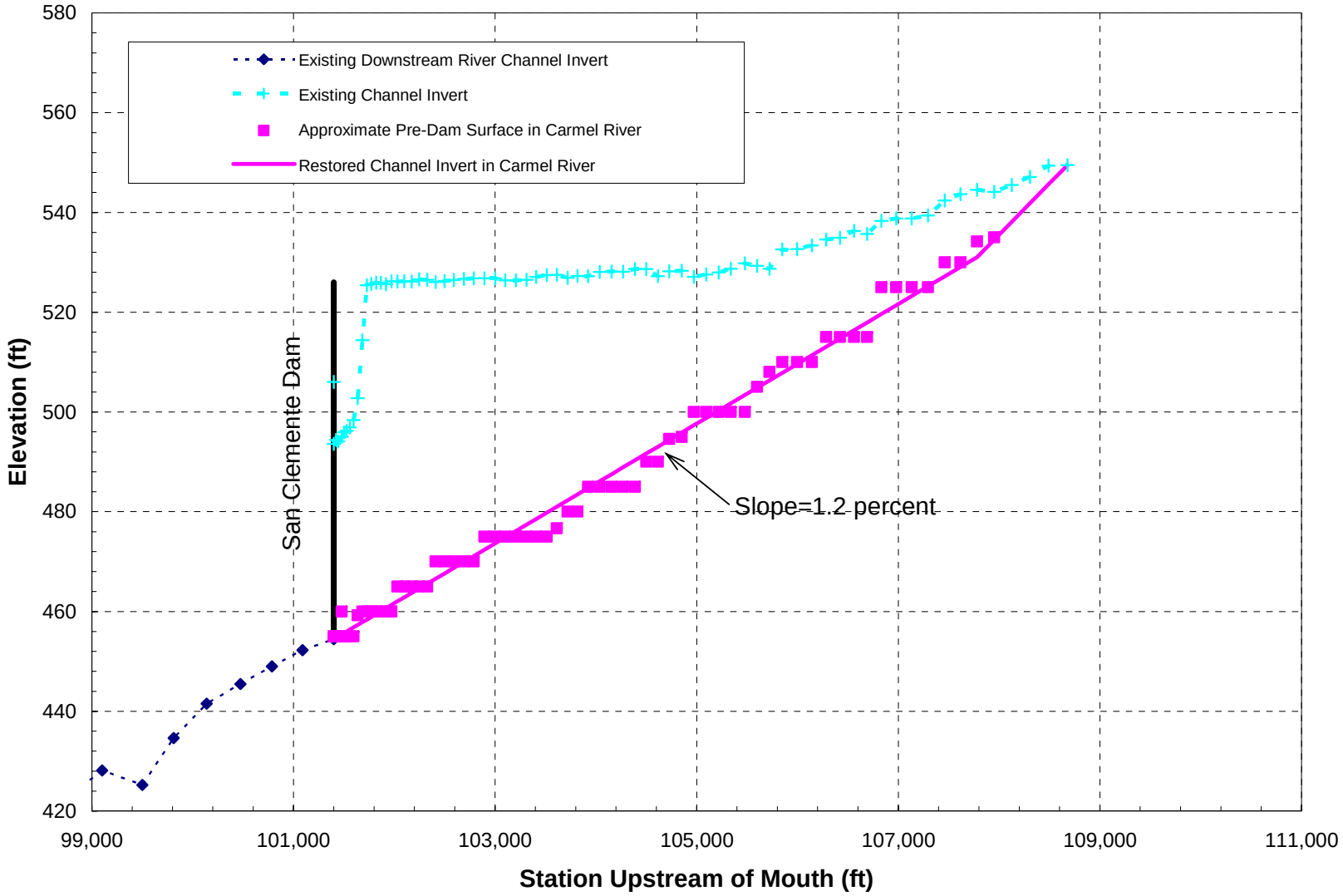


Figure 5. Profiles of the existing sediment deposits and reconstructed reach of the Carmel River Branch for the Complete Dam Removal Alternative.

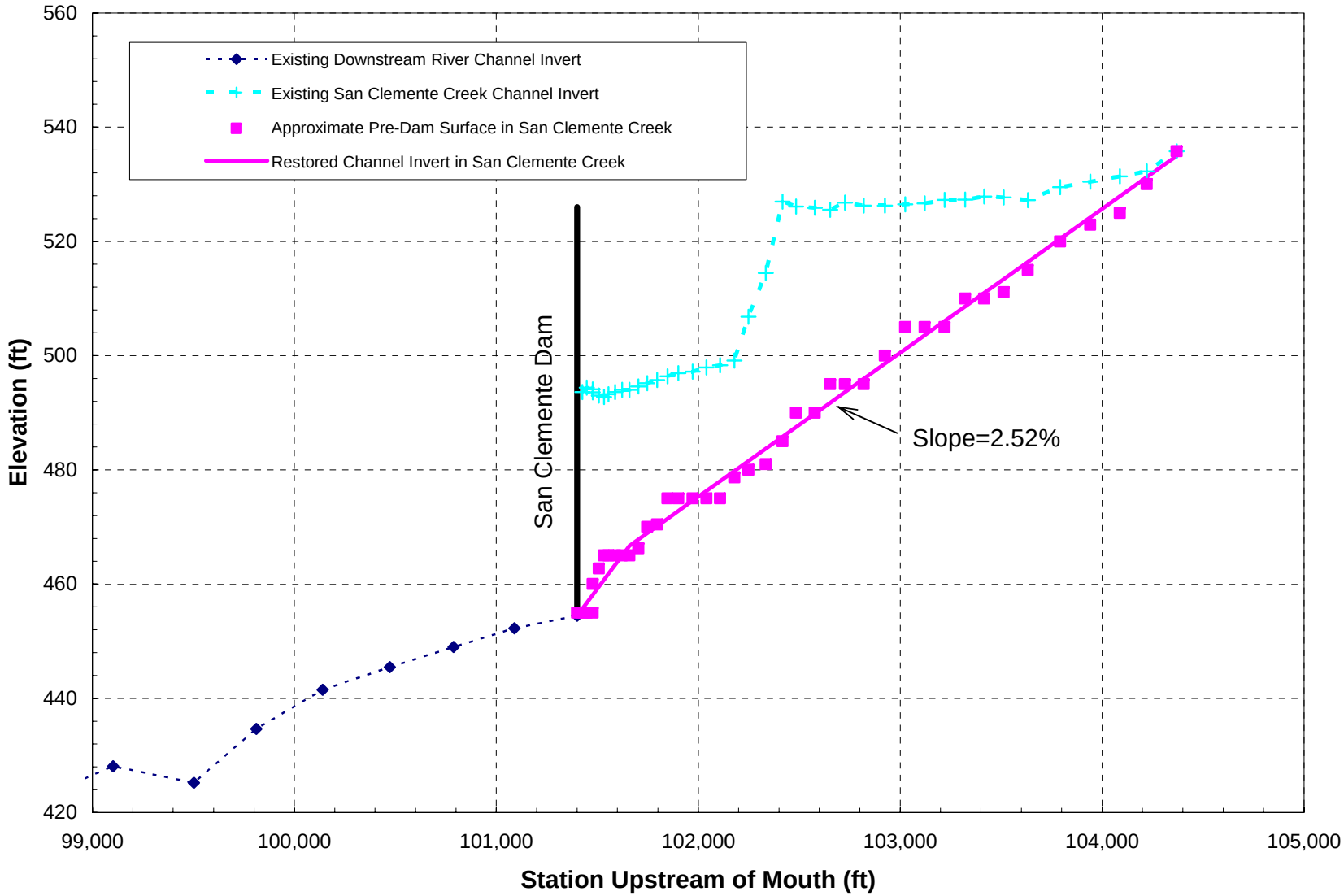


Figure 6. Profiles of the existing sediment deposits and reconstructed reach of the San Clemente Creek Branch for the Complete Dam Removal Alternative.

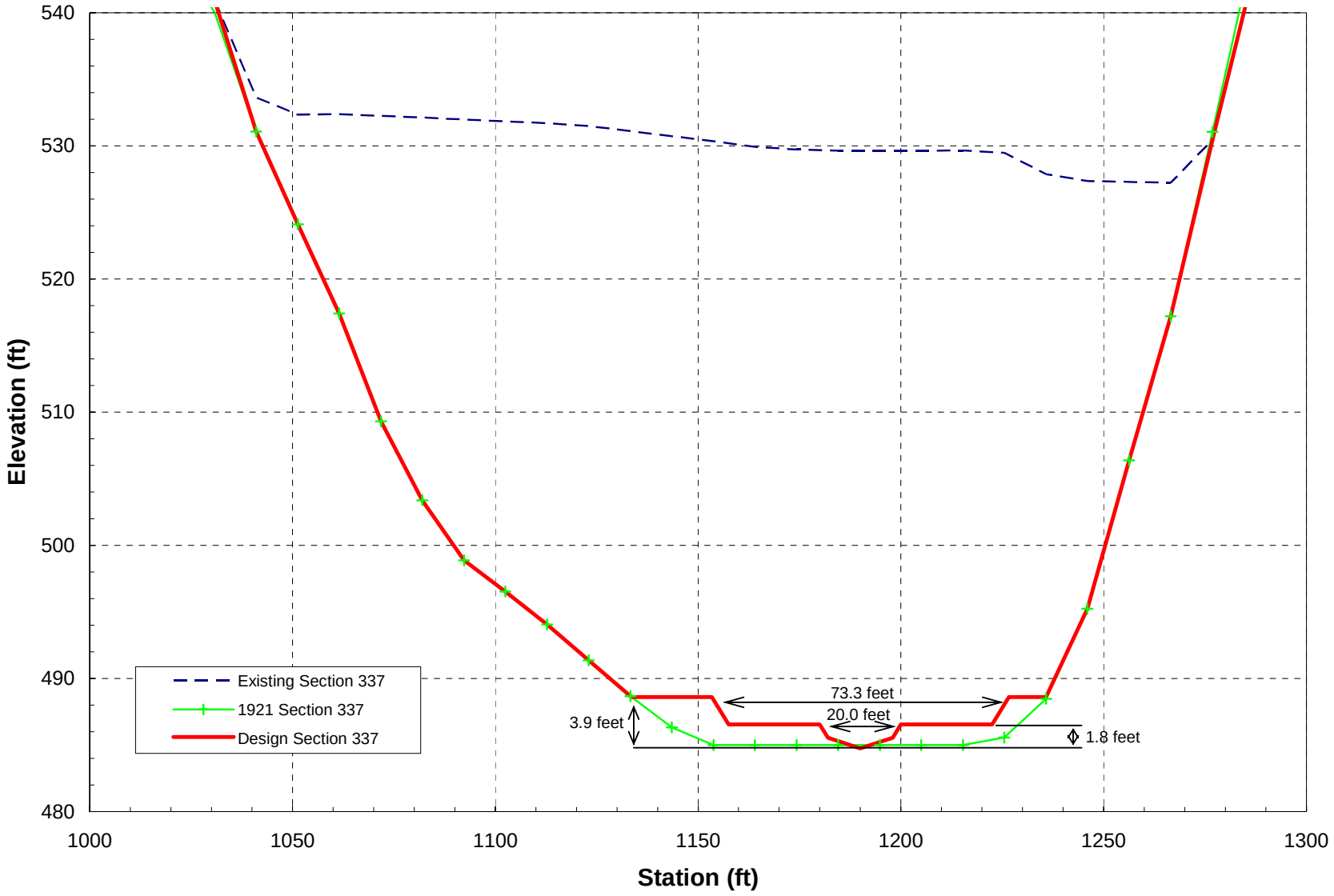


Figure 7. Typical cross section and design channel geometry for the reconstructed reach of the Carmel River Branch under the Complete Dam Removal Alternative.

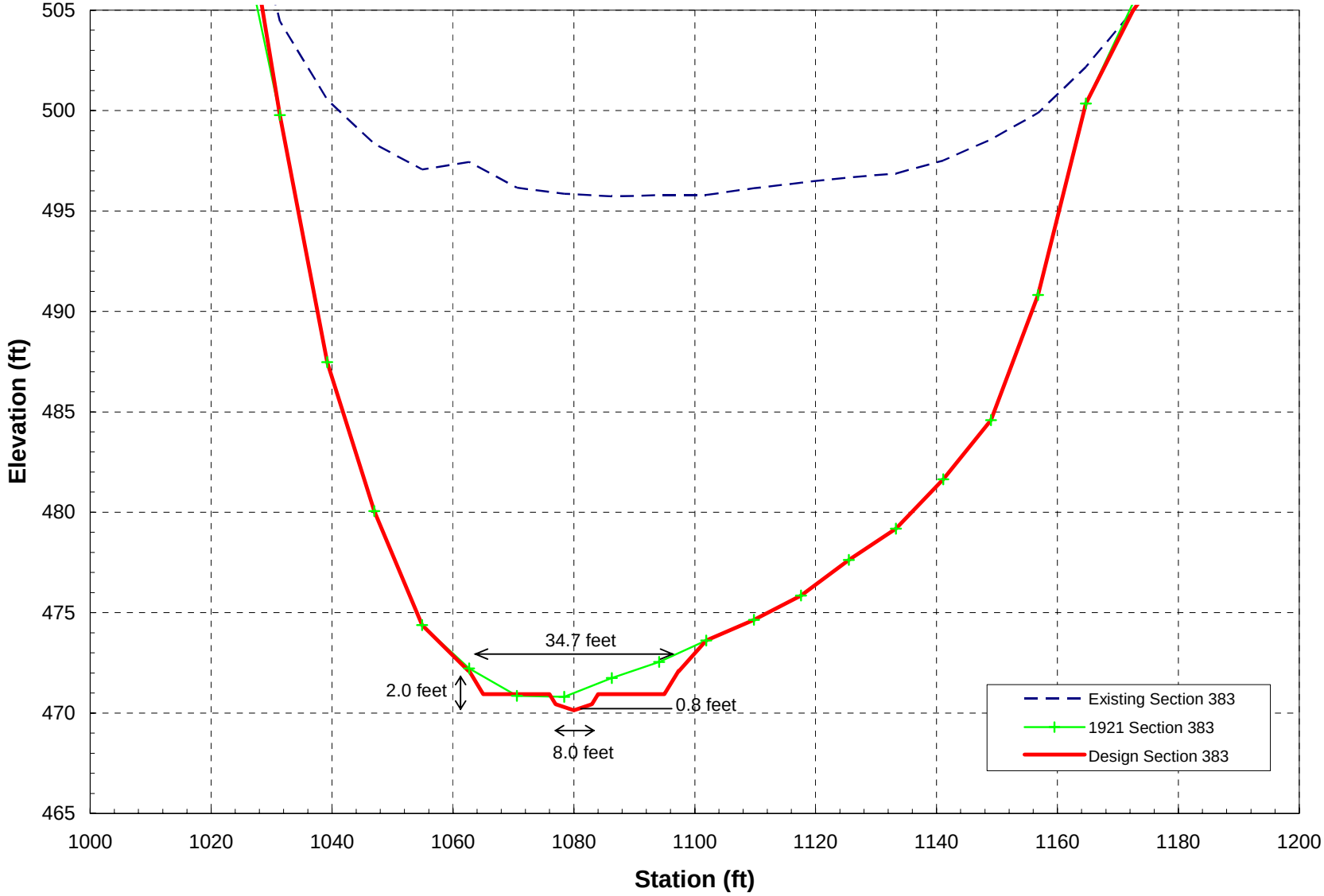


Figure 8. Typical cross section and design channel geometry for the reconstructed reach of the San Clemente Creek Branch under the Complete Dam Removal Alternative.

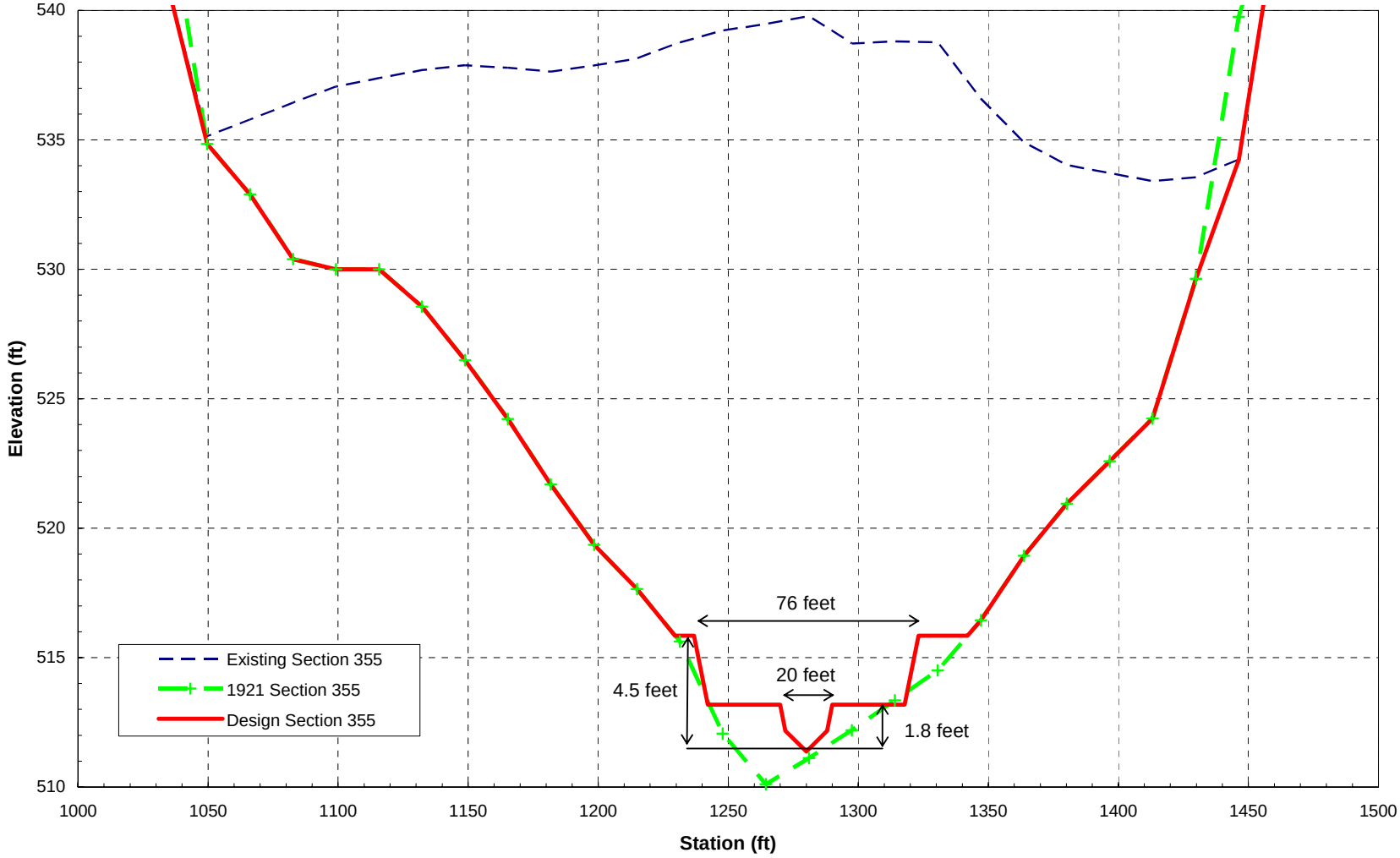


Figure 9. Typical cross section and design channel geometry (upstream from the intersection with the pre-dam surface) for the reconstructed reach of the Carmel Branch under the Notching Alternative.

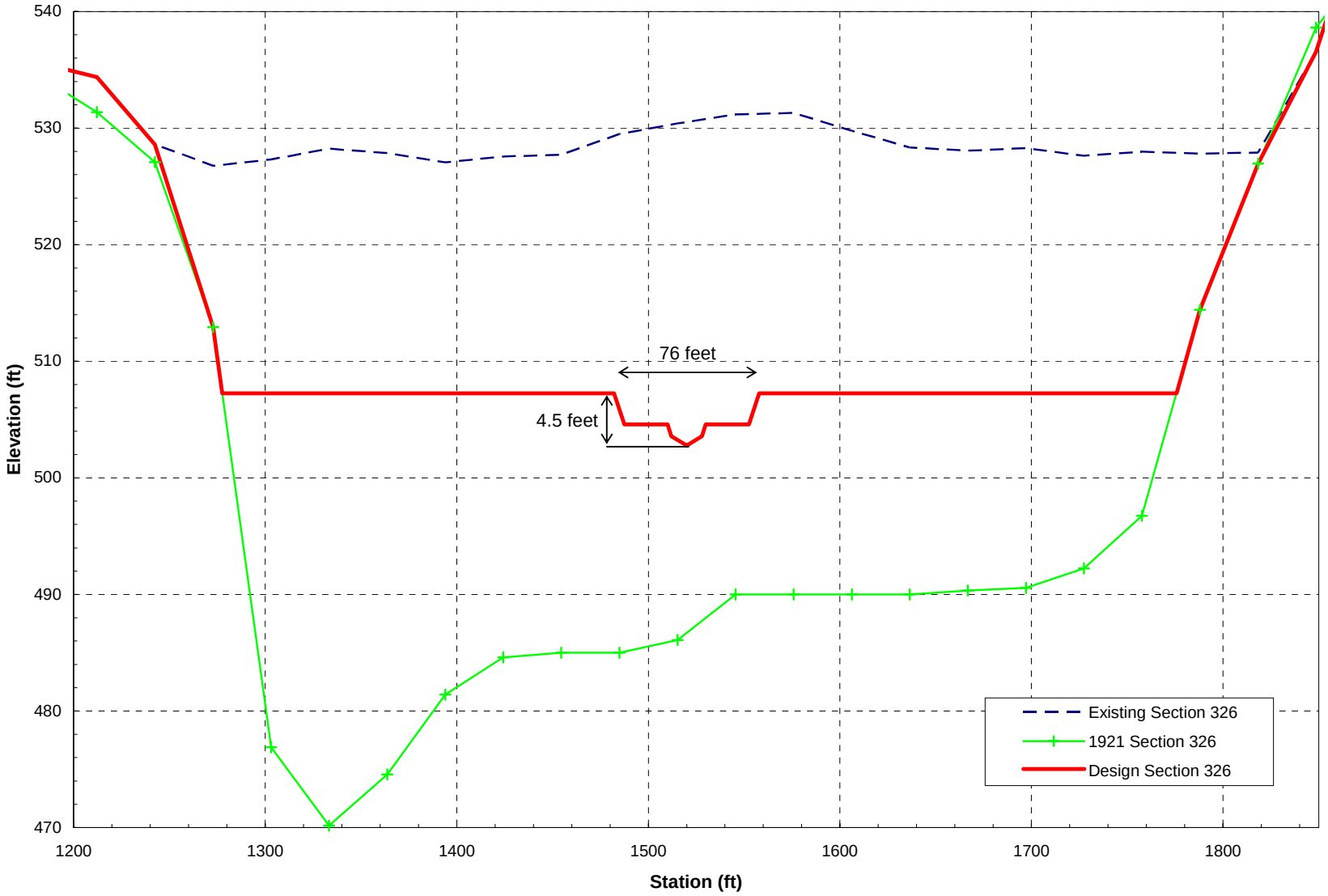


Figure 10. Typical cross section and design channel geometry (downstream from the intersection with the pre-dam surface) for the reconstructed reach of the Carmel Branch under the Notching Alternative.

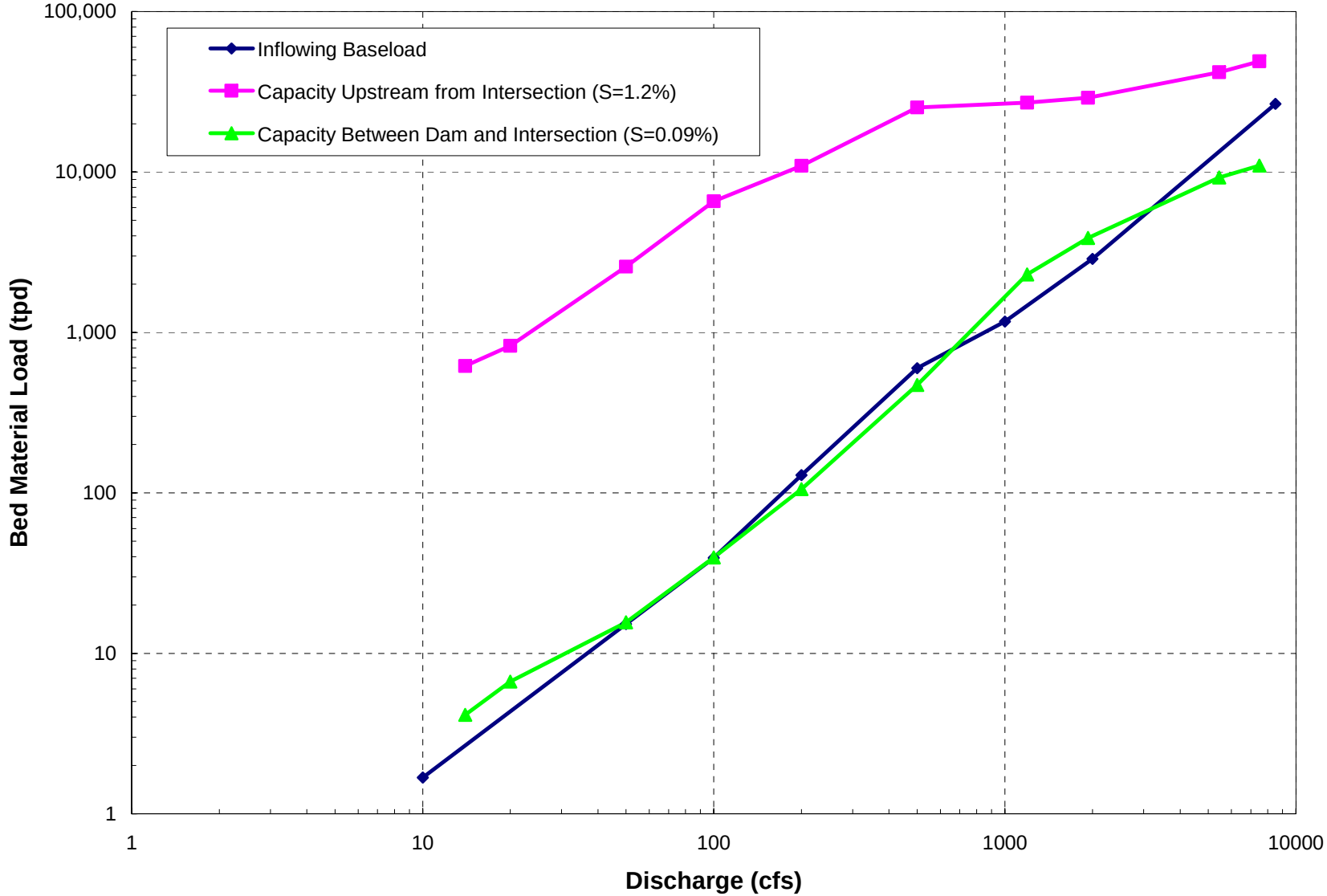


Figure 11. Inflowing sediment load (base load) and computed transport capacity of the reconstructed reach of the Carmel River between the dam and the intersection with the pre-dam surface.

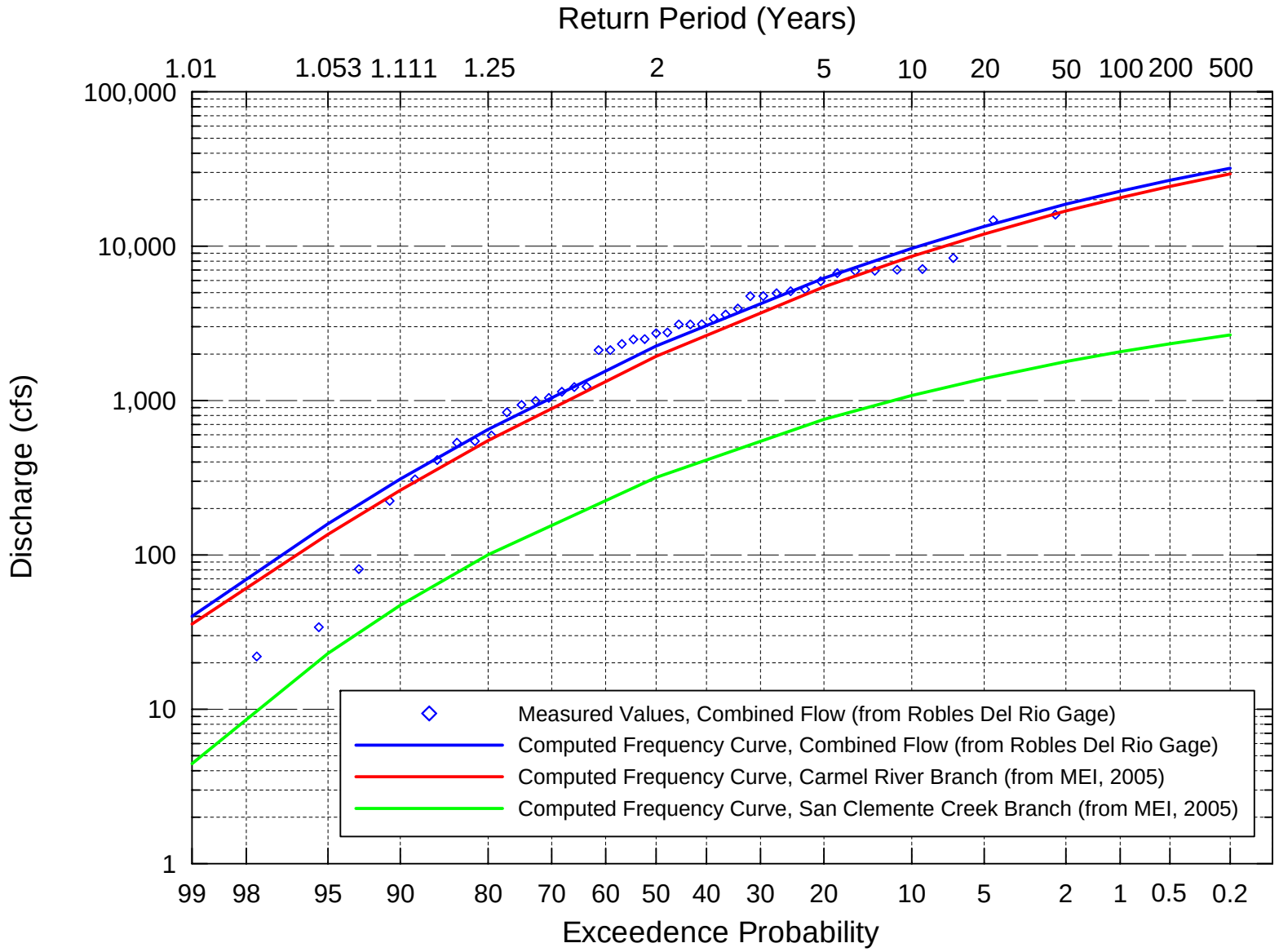


Figure 12. Computed peak flood-frequency curve for the combined flow (based on the Robles Del Rio flood-frequency analysis), and for the Carmel River and San Clemente Creek Branches of San Clemente Reservoir (as discussed in MEI, 2005).

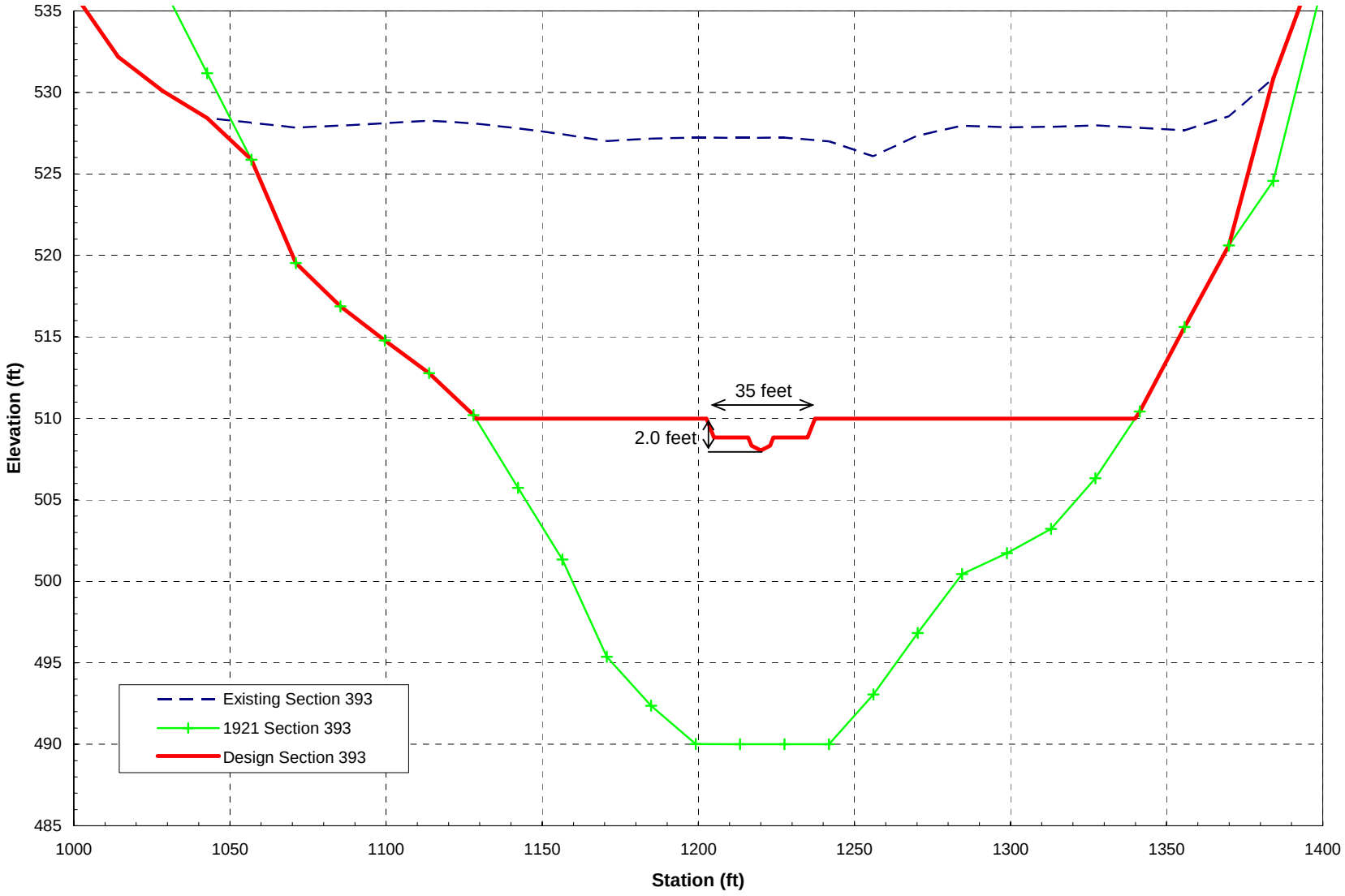


Figure 13. Typical cross section and design channel geometry for the reconstructed reach of the San Clemente Creek Branch under the Notching Alternative.

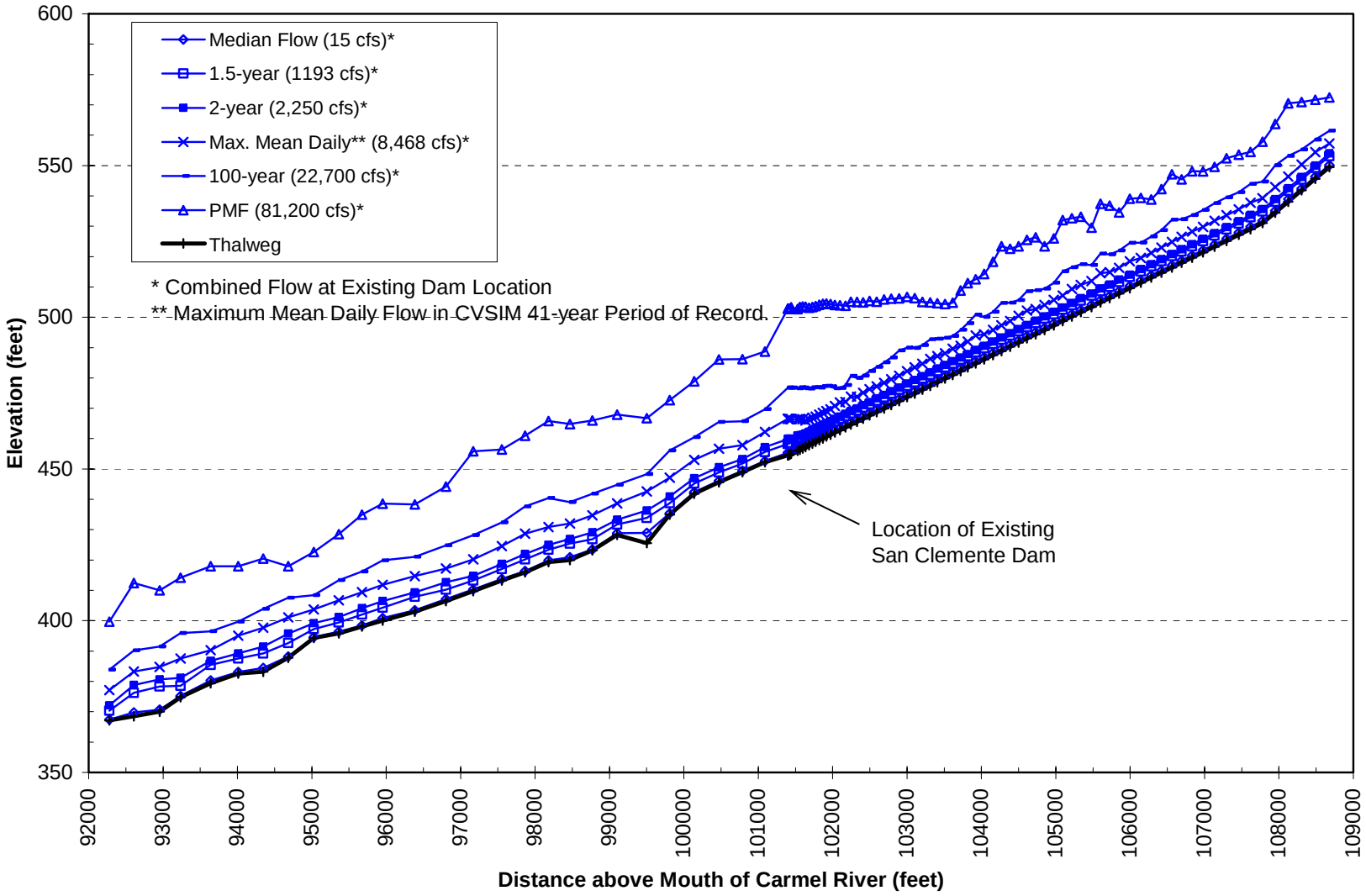


Figure 14. Computed water-surface profiles for selected discharges in the Carmel Branch of San Clemente Reservoir under the Complete Dam Removal Alternative.

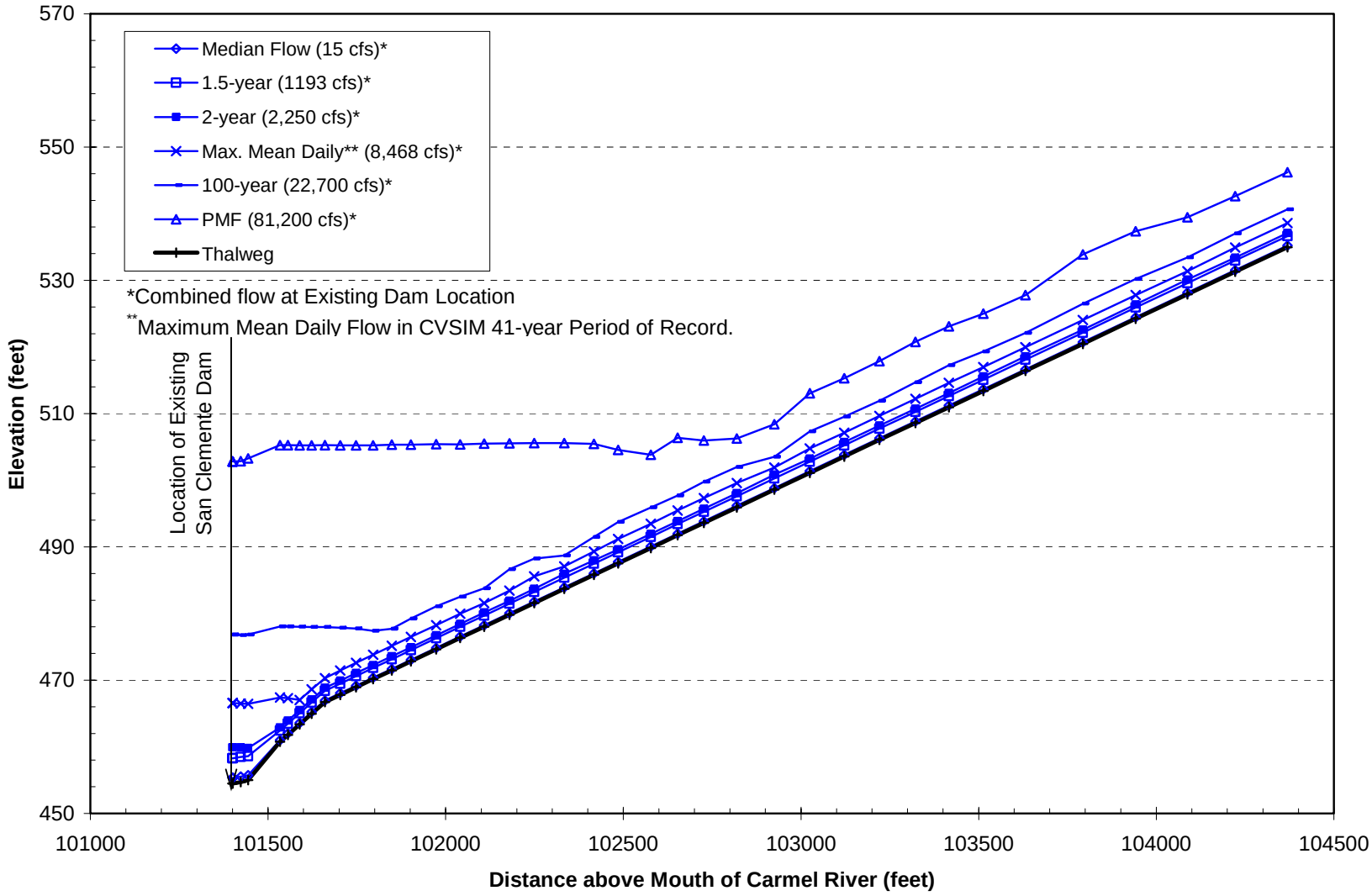


Figure 15. Computed water-surface profiles for selected discharges in the San Clemente Creek Branch of San Clemente Reservoir under the Complete Dam Removal Alternative.

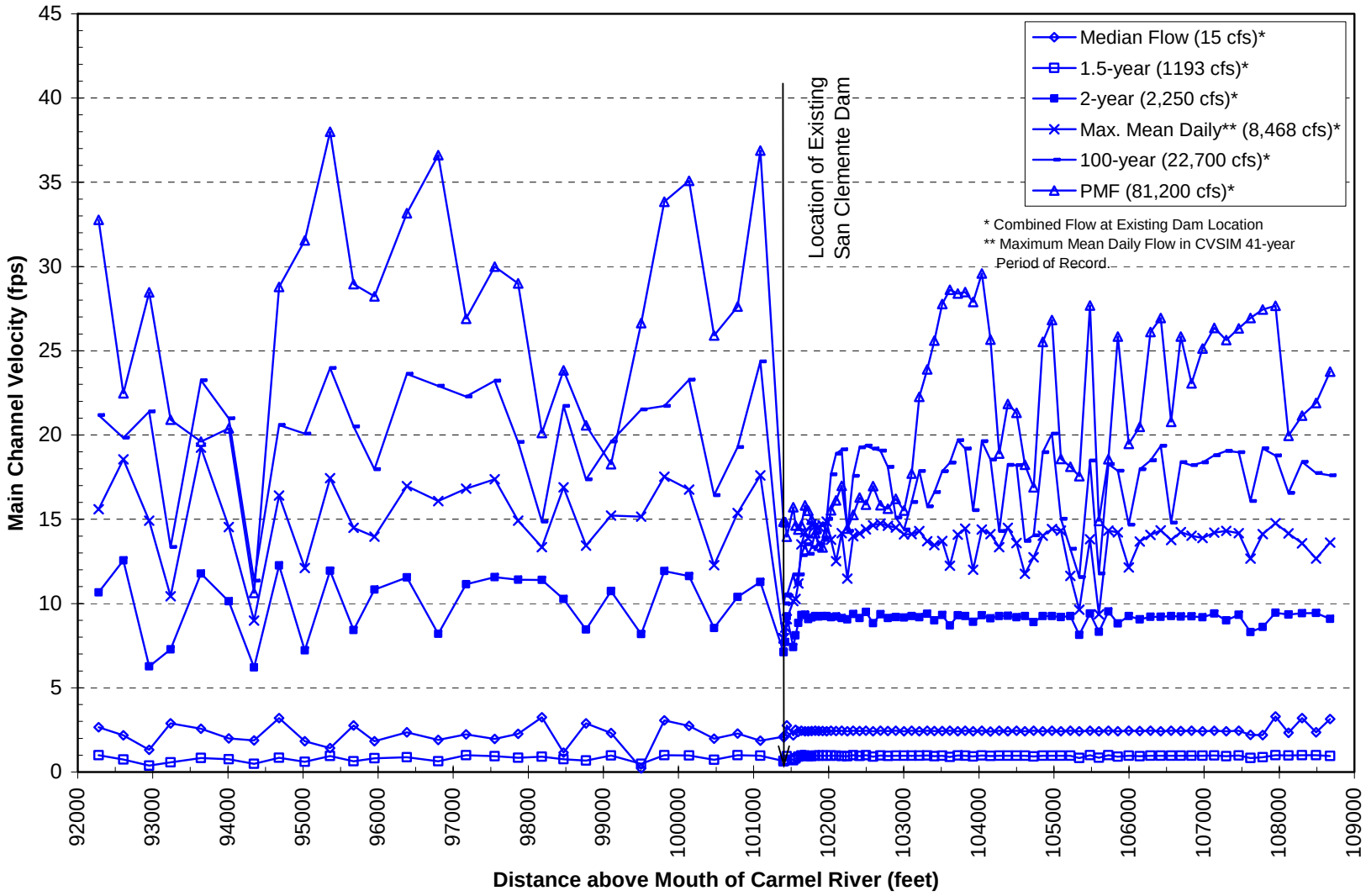


Figure 16. Computed main-channel velocity profiles for selected discharges in the Carmel River Branch of San Clemente Reservoir under the Complete Dam Removal Alternative.

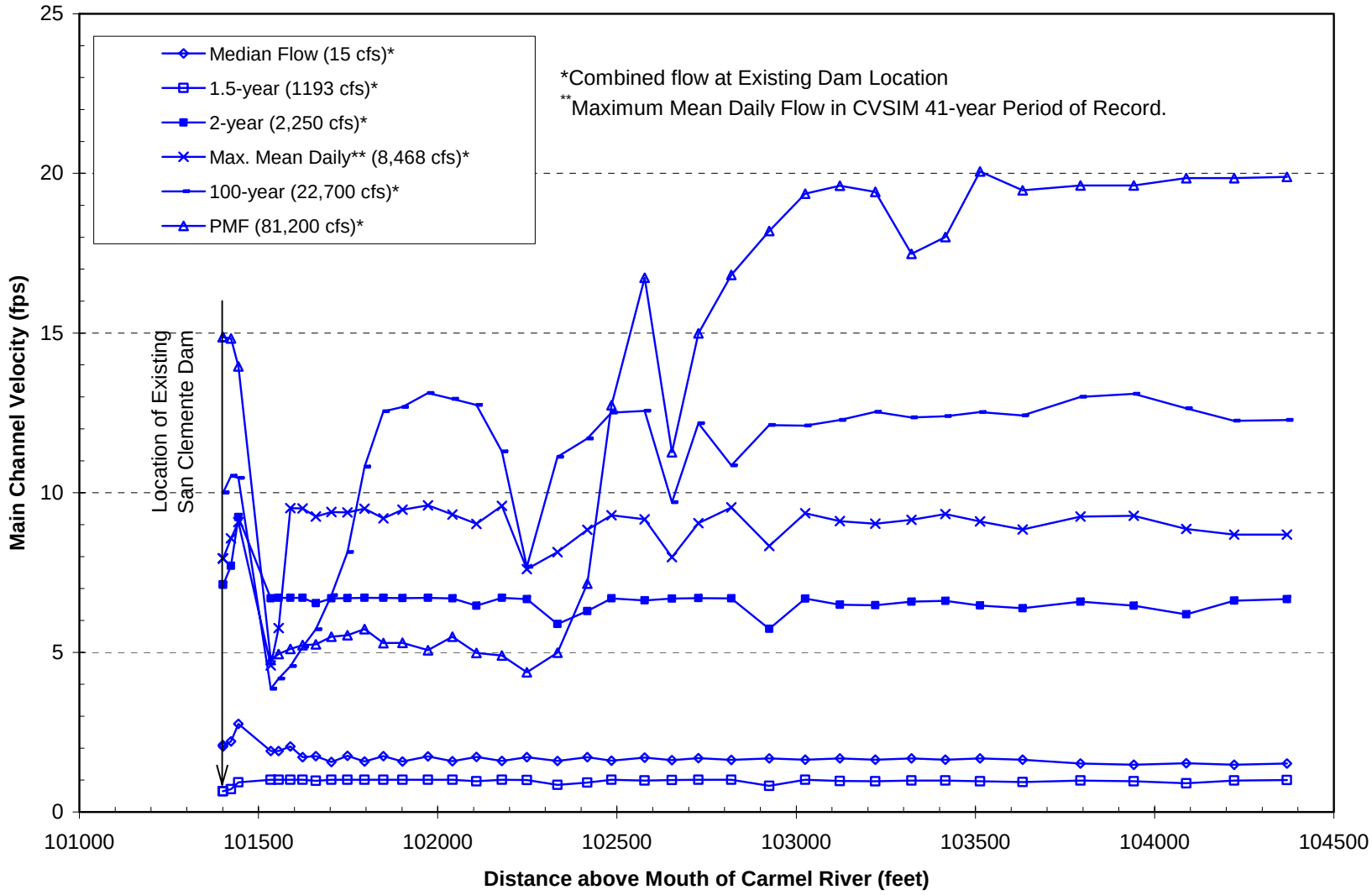


Figure 17. Computed main-channel velocity profiles for selected discharges in the San Clemente Creek Branch of San Clemente Reservoir under the Complete Dam Removal Alternative.

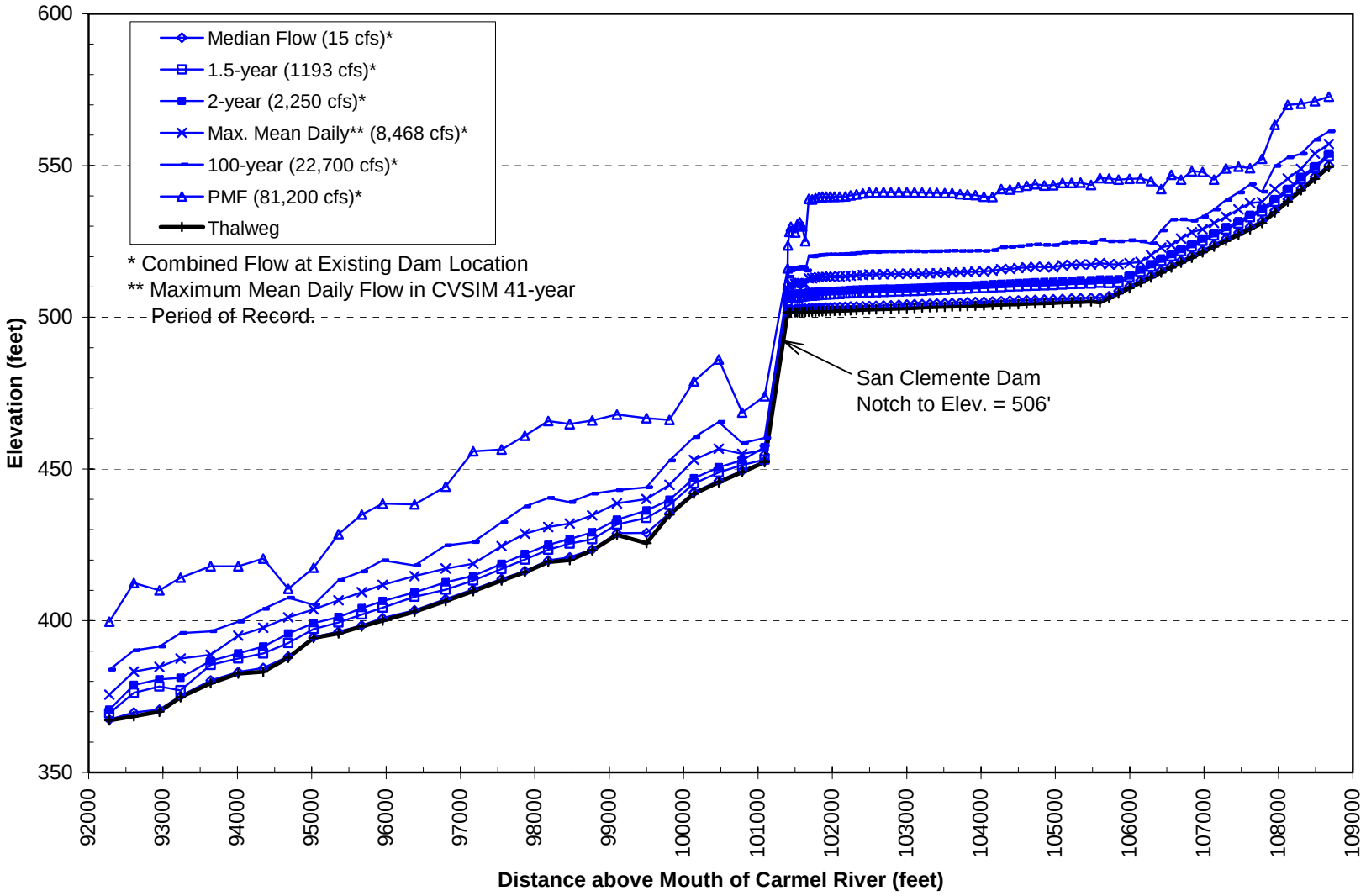


Figure 18. Computed water-surface profiles for selected discharges in the Carmel Branch of San Clemente Reservoir under the Notching Alternative.

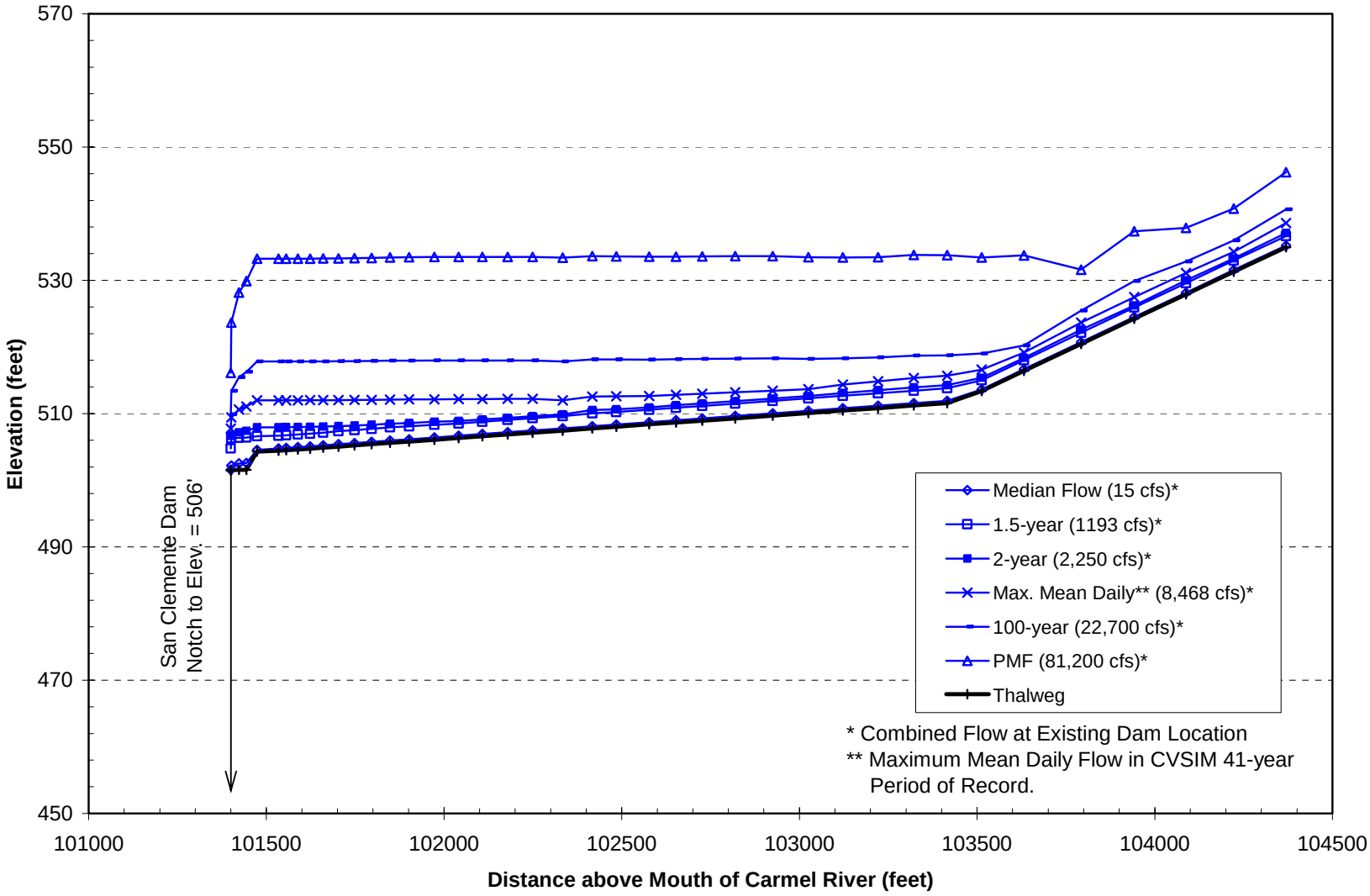


Figure 19. Computed water-surface profiles for selected discharges in the San Clemente Creek Branch of San Clemente Reservoir under the Notching Alternative.

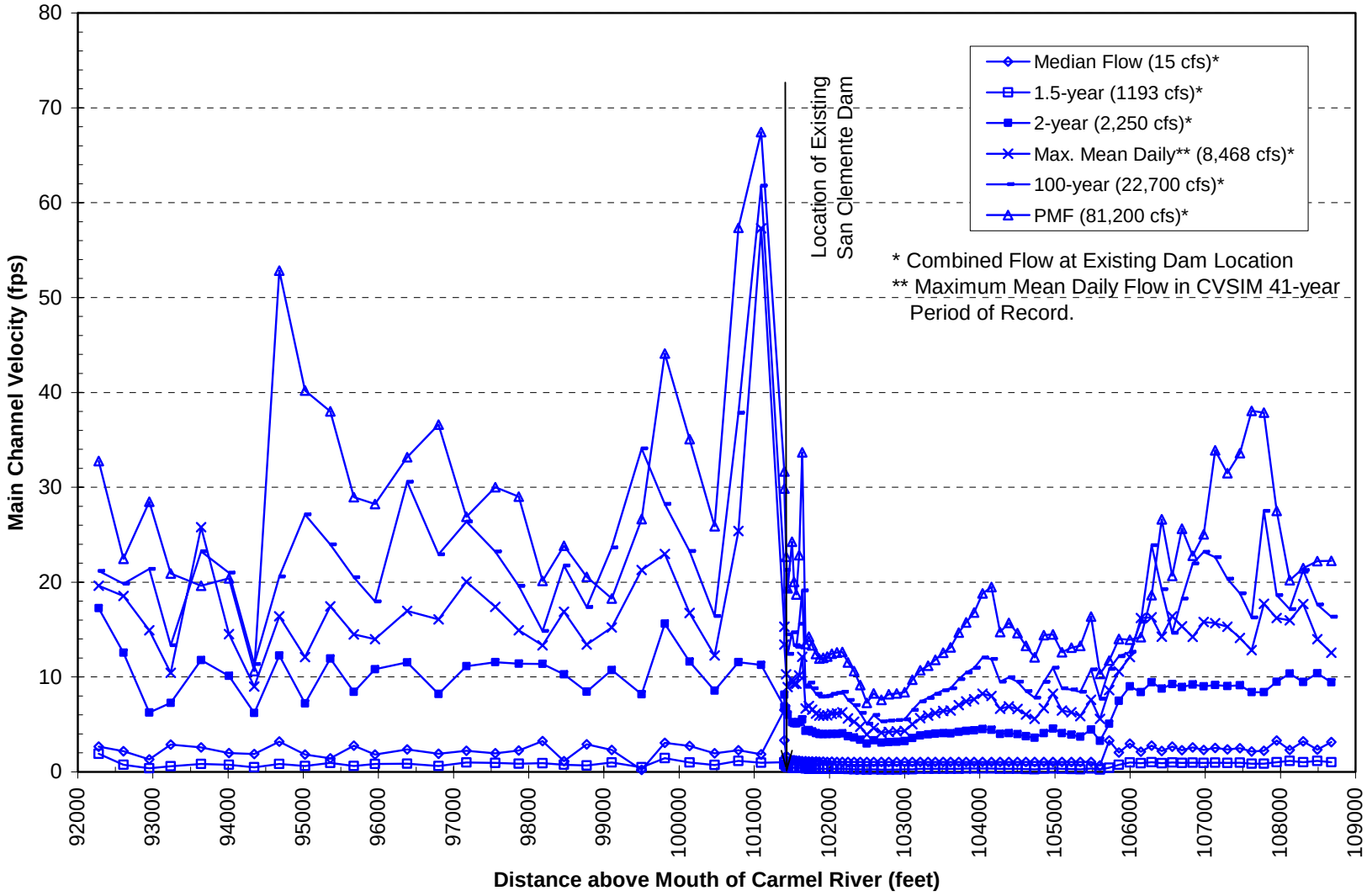


Figure 20. Computed main-channel velocity profiles for selected discharges in the Carmel Branch of San Clemente Reservoir under the Notching Alternative.

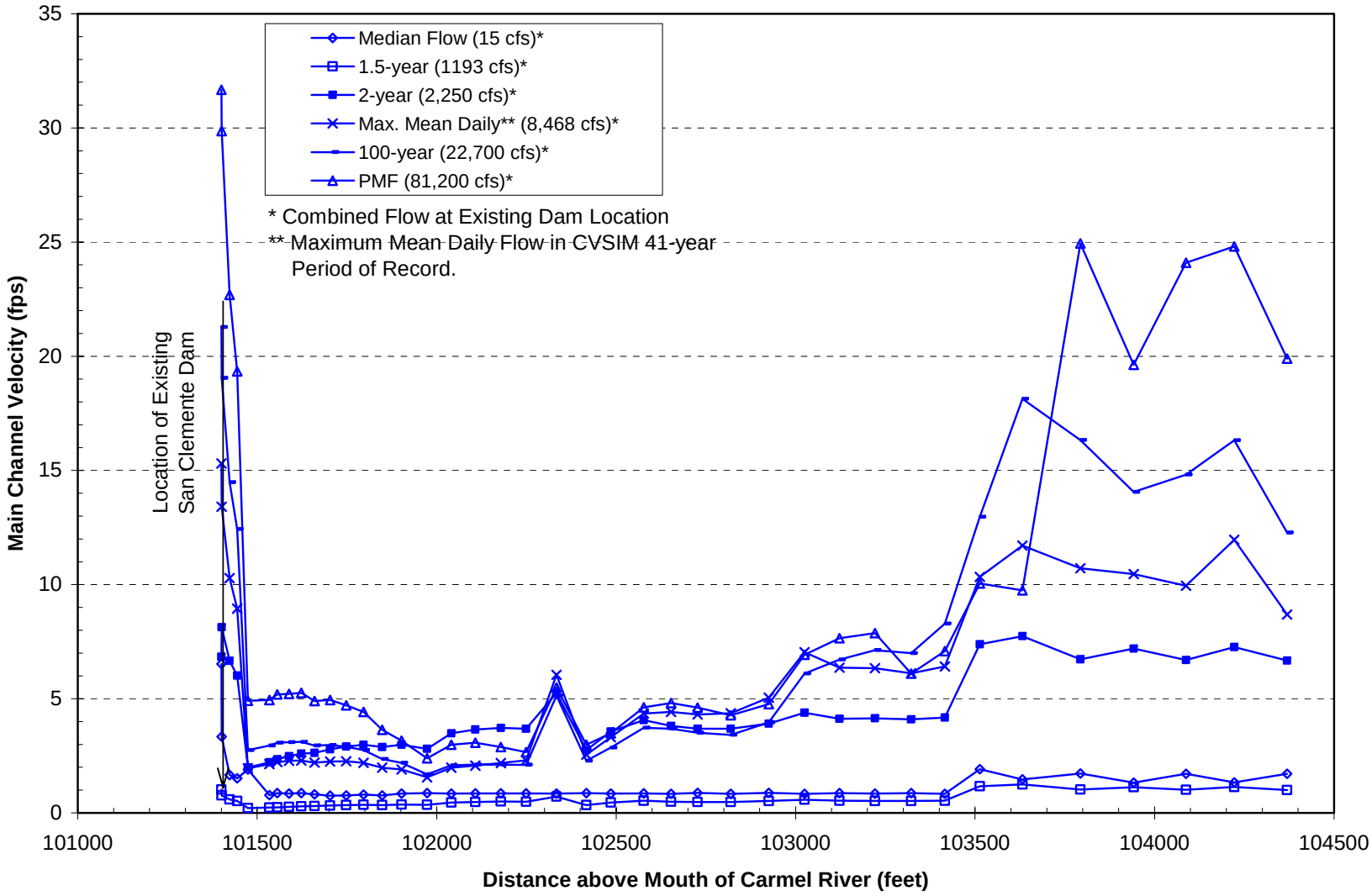


Figure 21. Computed main-channel velocity profiles for selected discharges in the San Clemente Creek Branch of San Clemente Reservoir under the Notching Alternative.

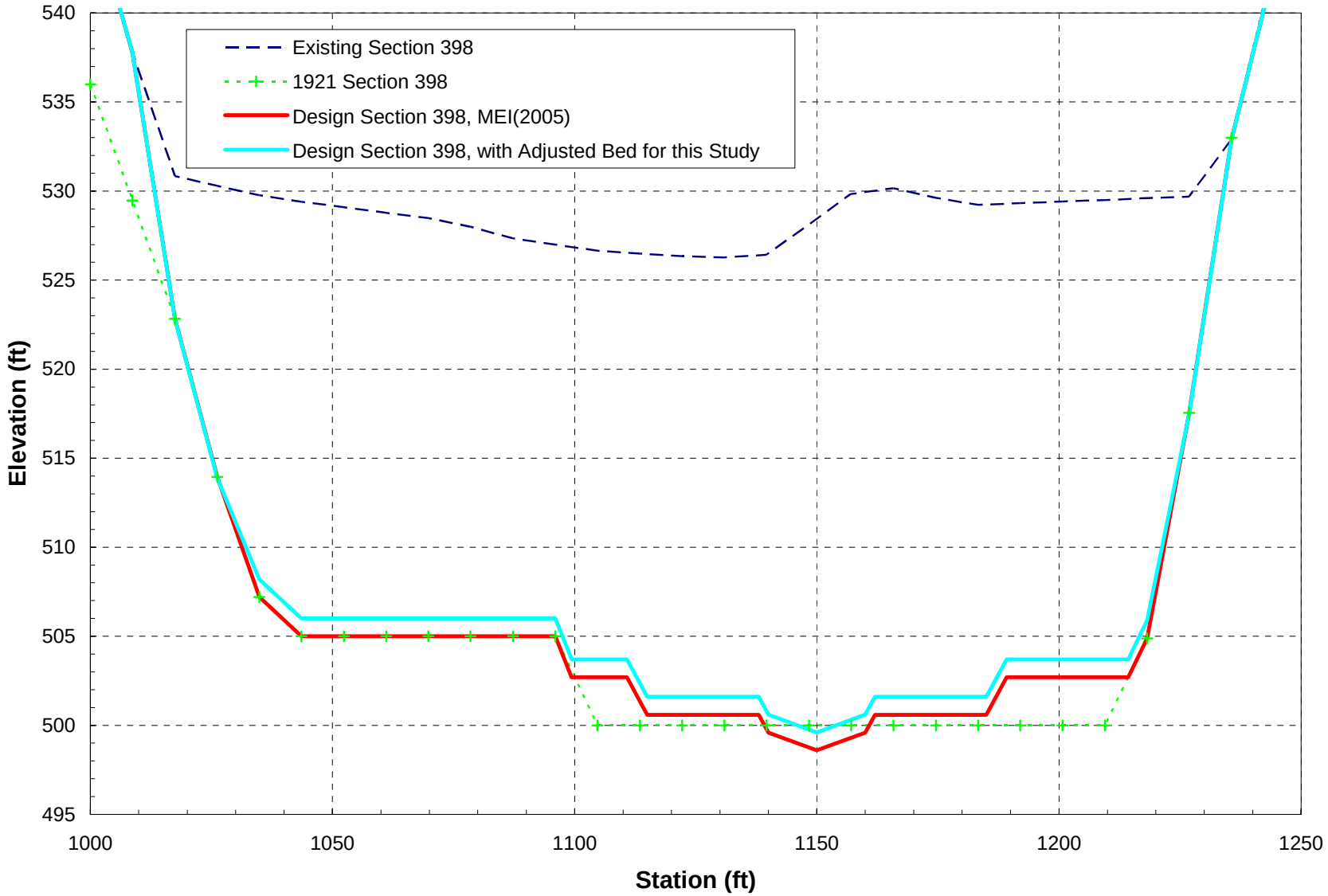


Figure 22. Typical cross section in the reconstructed reach of San Clemente Creek under the Carmel River Bypass Alternative showing the existing section, the pre-dam (1921) section, the design section (MEI, 2005), and the adjusted design section for this study.

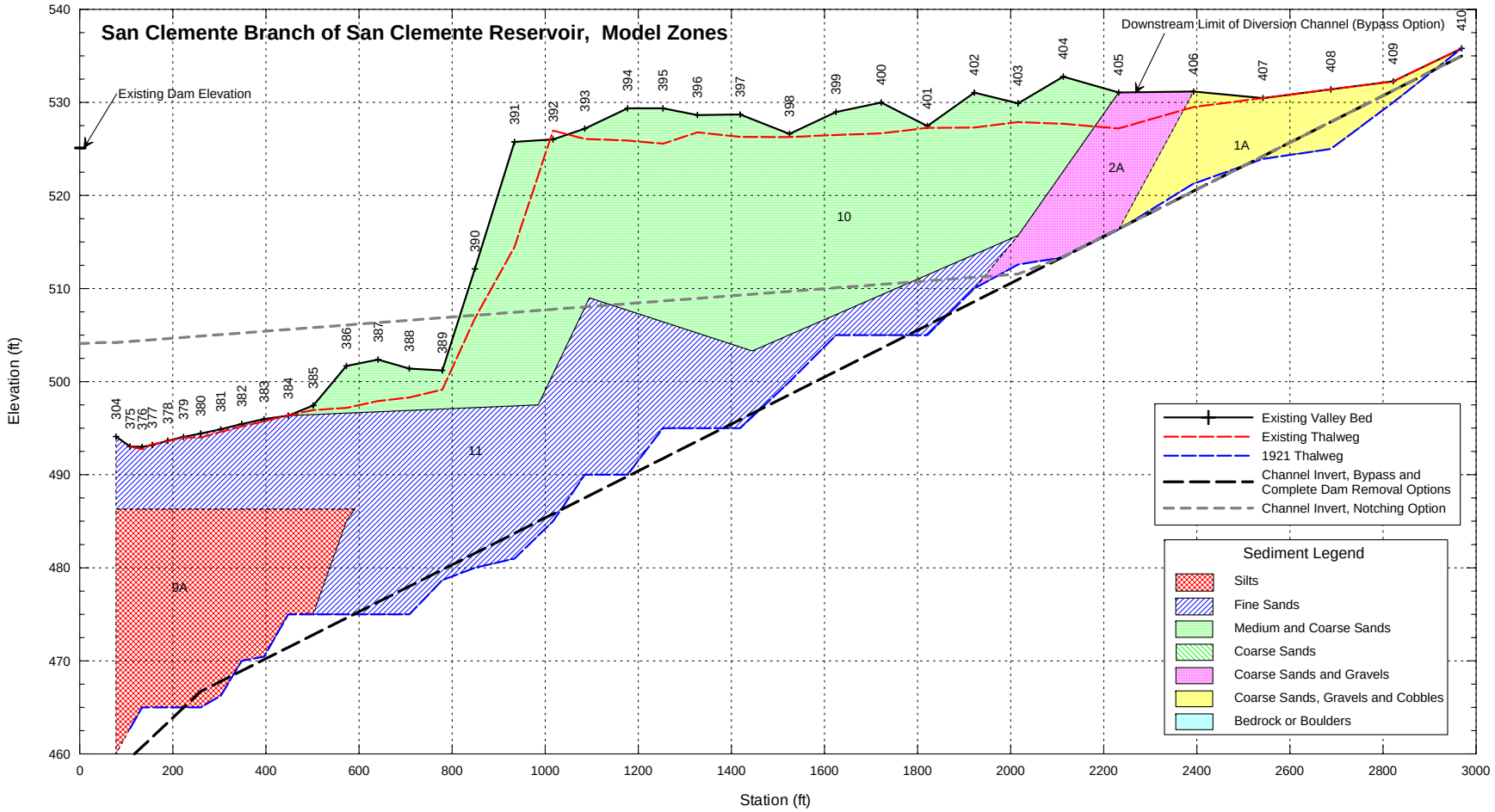


Figure 23. Profile of reservoir sediment zones and the channel invert for the Bypass, the Complete Dam Removal, and for the Notching Alternatives, San Clemente Creek Branch of San Clemente Reservoir.

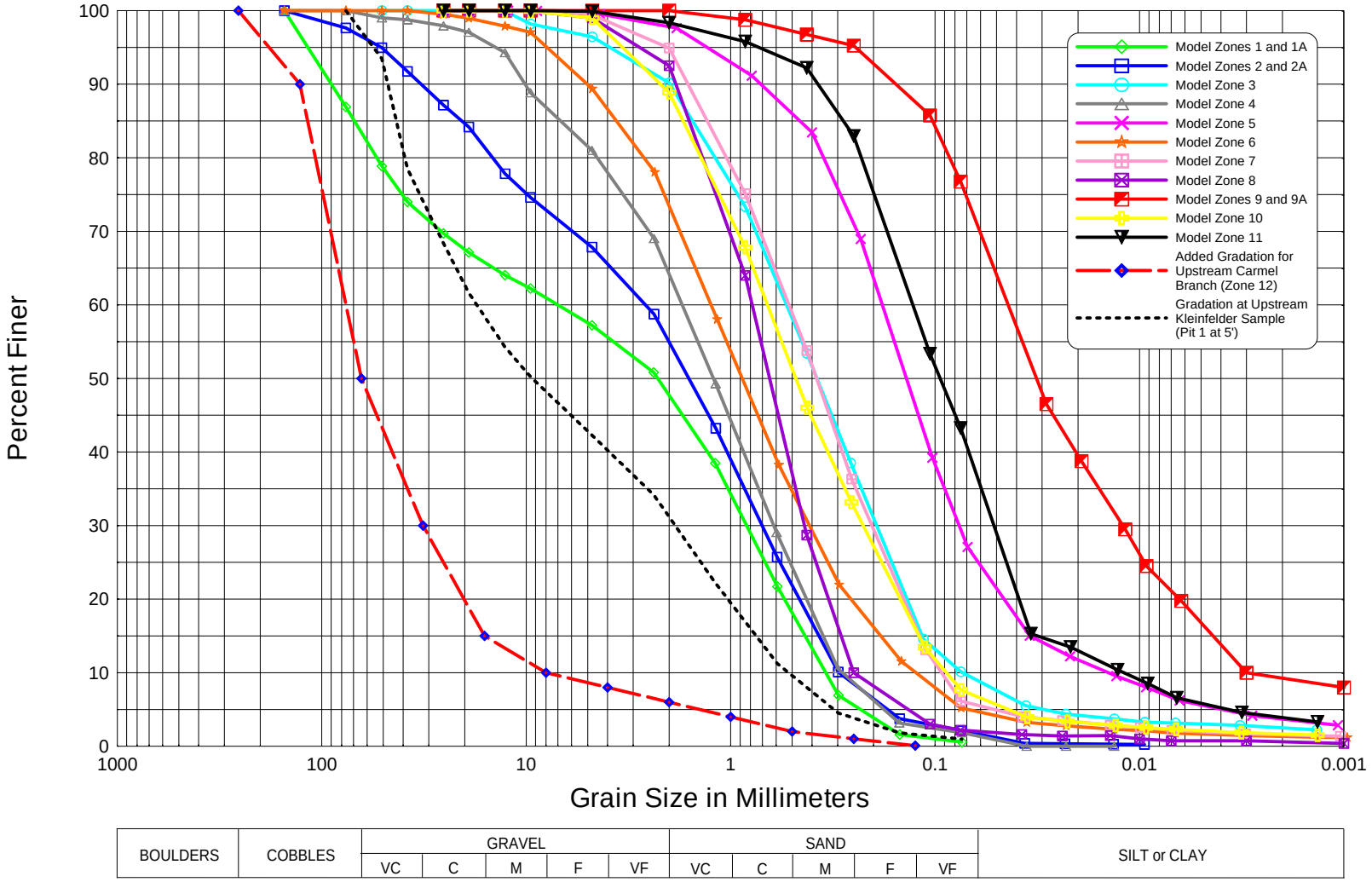


Figure 24. Gradation curves for the model sediment zones (from MEI, 2005).

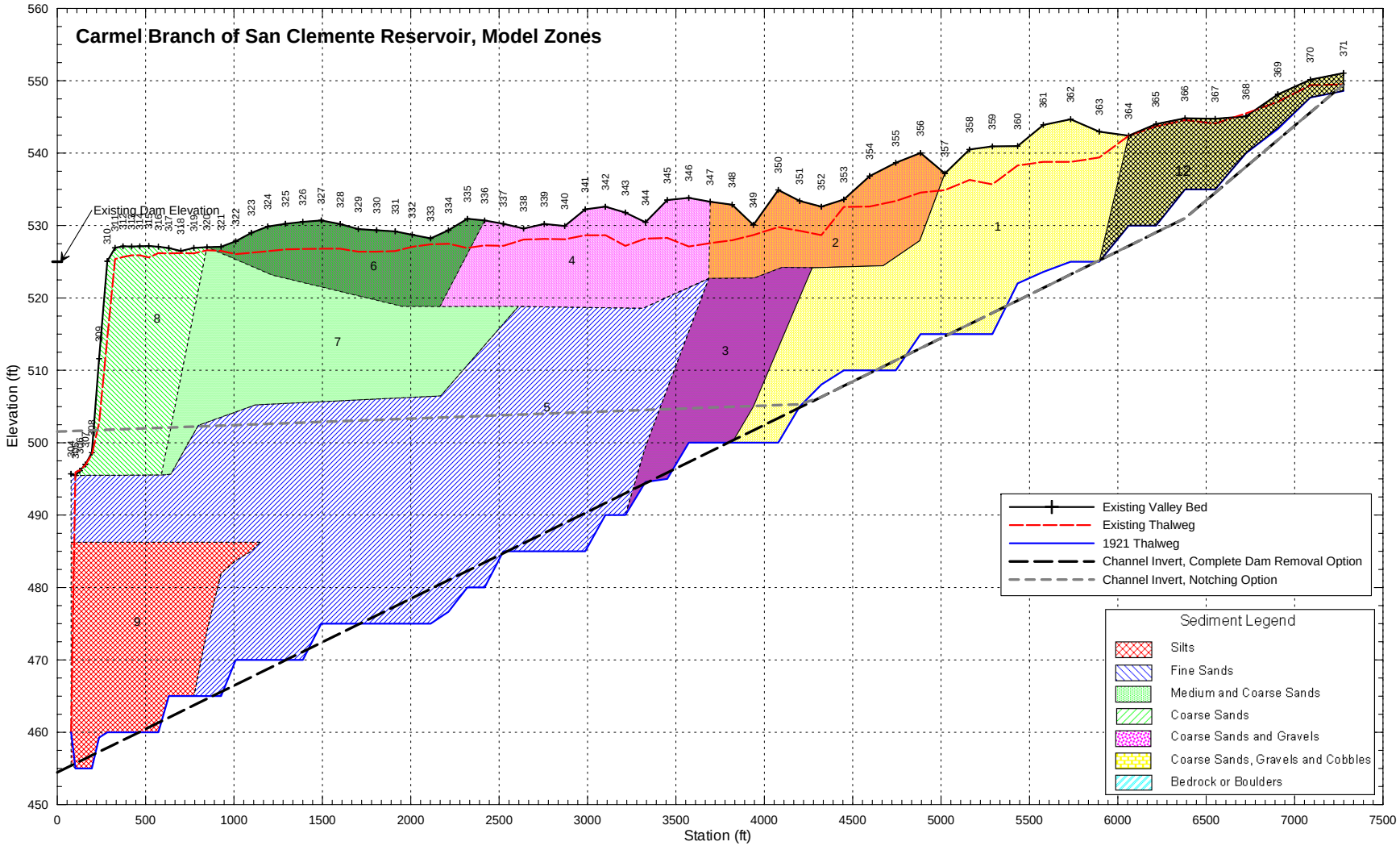


Figure 25. Profile of reservoir sediment zones and the channel invert for the Complete Dam Removal Alternative and for the Notching Alternative, Carmel Branch of San Clemente Reservoir.

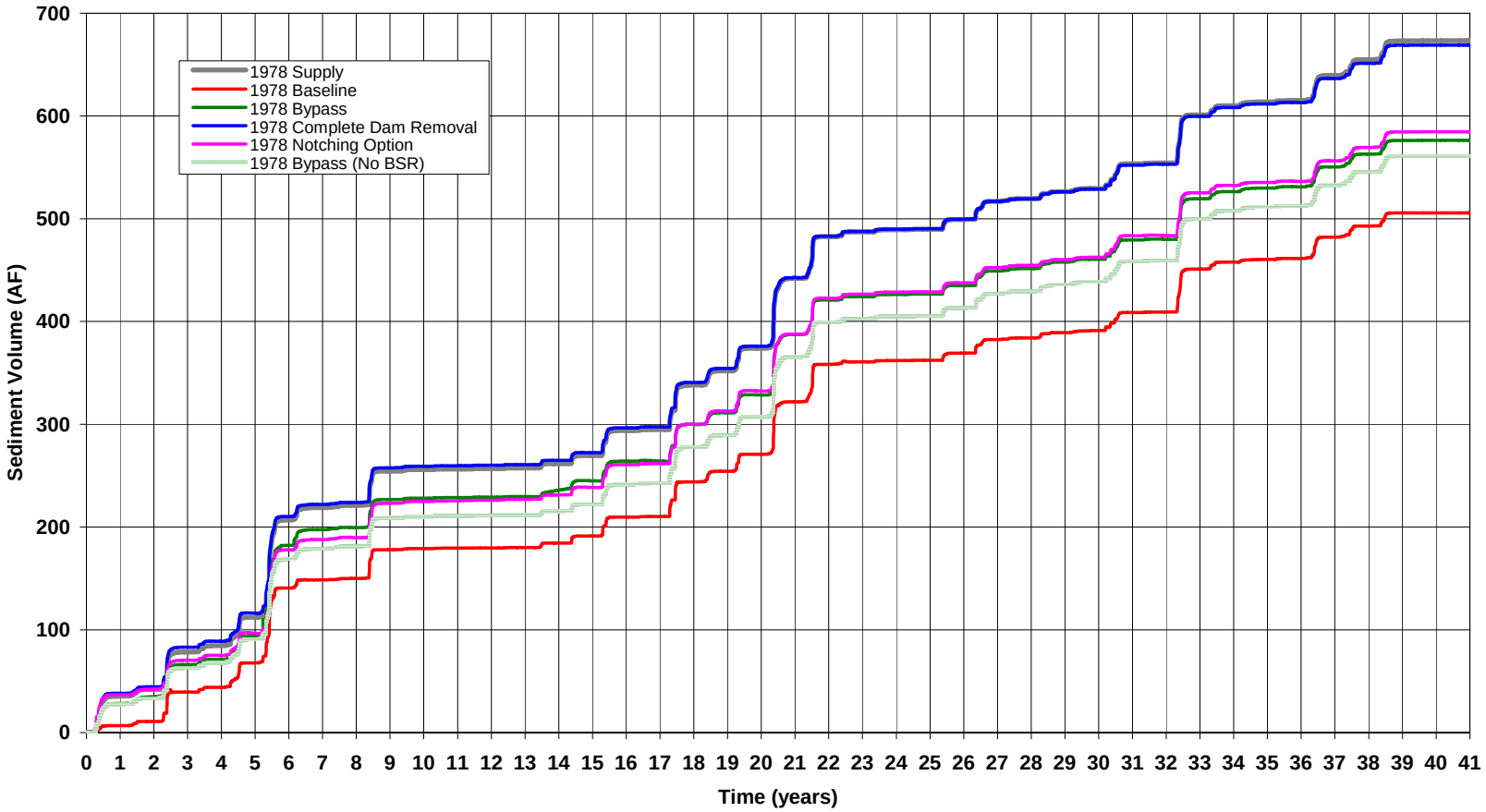


Figure 26. Inflowing base load and estimated sediment load passing the location of the existing dam for baseline (with dam) conditions evaluated in MEI (2005) and for the Bypass, Complete Dam Removal, and Notching Alternatives evaluated in this study (1978 start date). Also shown are the results from the Bypass Alternative with no BSR evaluated in MEI (2005) for the 1978 start date.

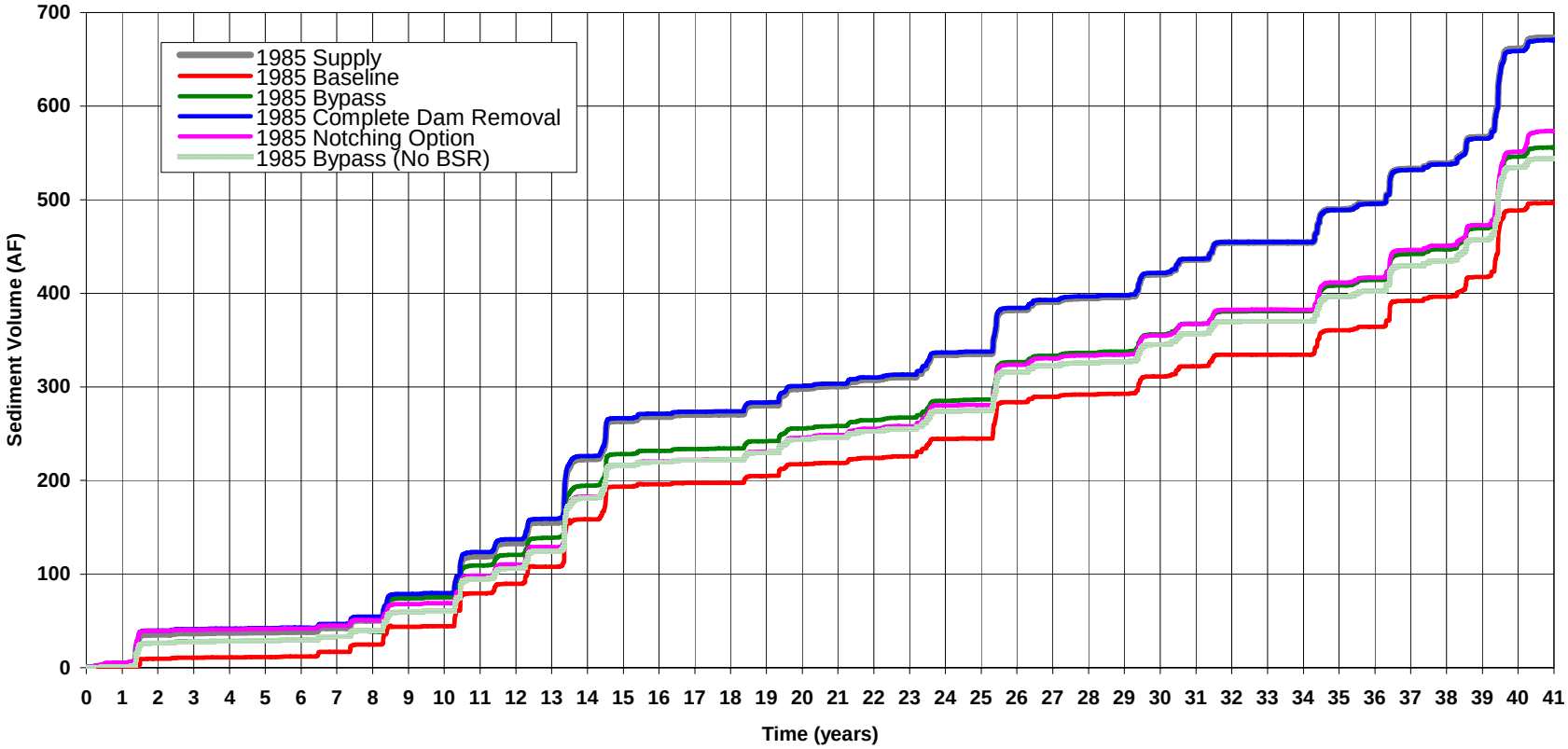


Figure 27. Inflowing base load and computed sediment load passing the location of the existing dam for baseline (with dam) conditions evaluated in MEI (2005) and for the Bypass, Complete Dam Removal, and Notching Alternatives evaluated in this study (1985 start date). Also shown are the results from the Bypass Alternative with no BSR evaluated in MEI (2005) for the 1985 start date.

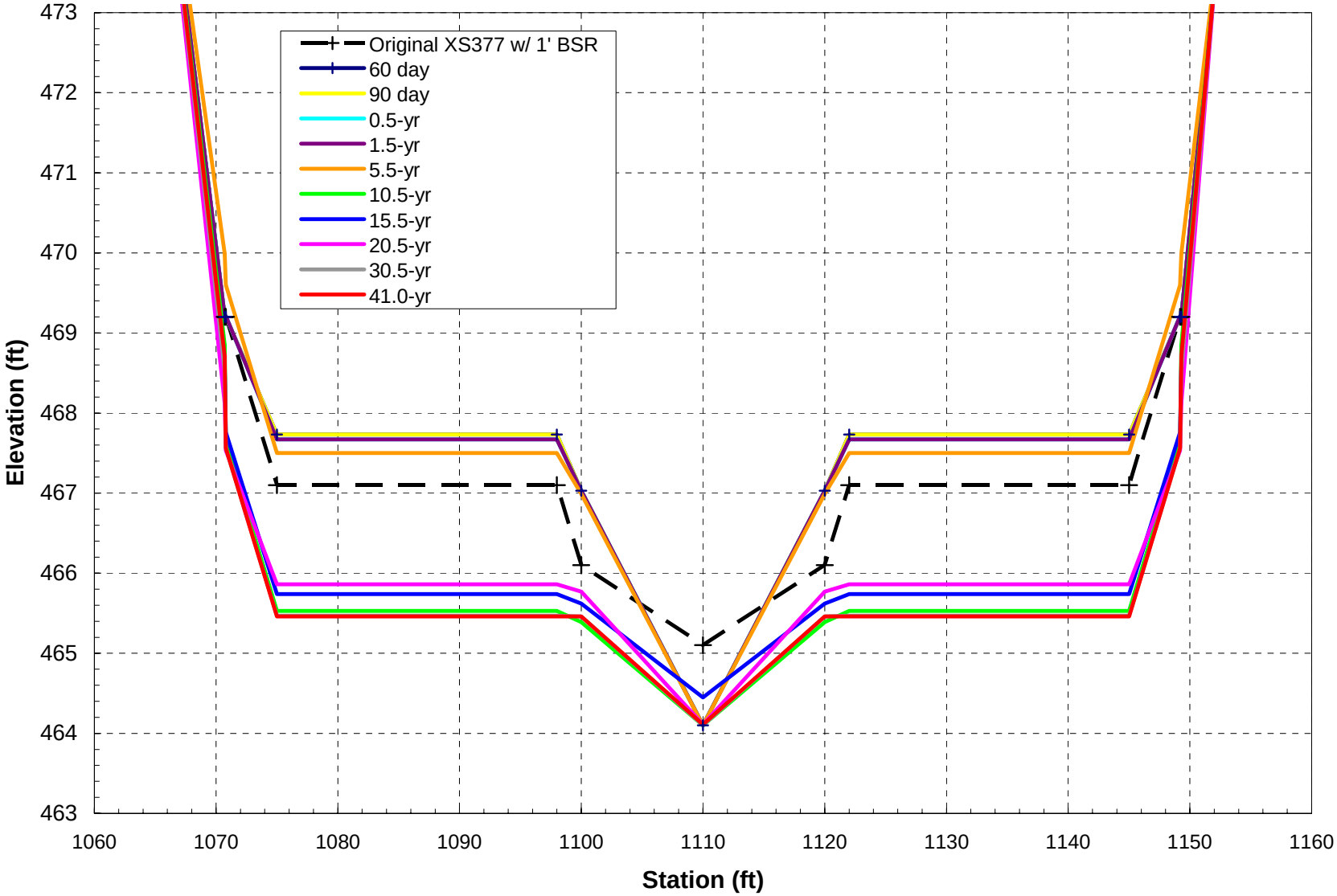


Figure 28. Typical cross section in the reconstructed reach of San Clemente Creek showing erosion of sediments in excess of 1.0 feet in the overbanks.

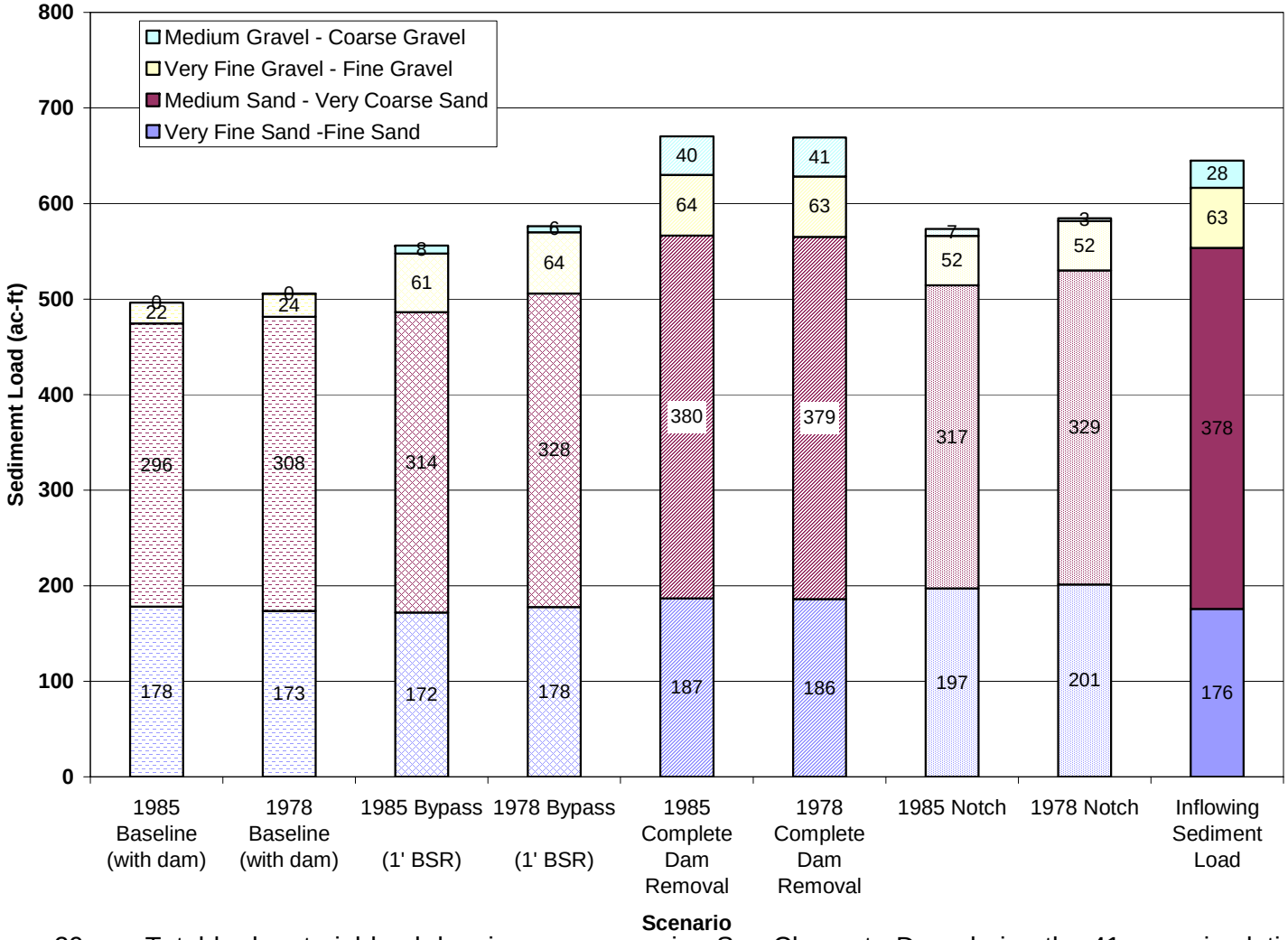


Figure 29. Total bed-material load, by size-range, passing San Clemente Dam during the 41-year simulation for baseline (with-dam) conditions evaluated in MEI (2005) and the Bypass, Complete Dam Removal, and Notching Alternatives for this study. Also shown is total sediment supply to the reservoir.

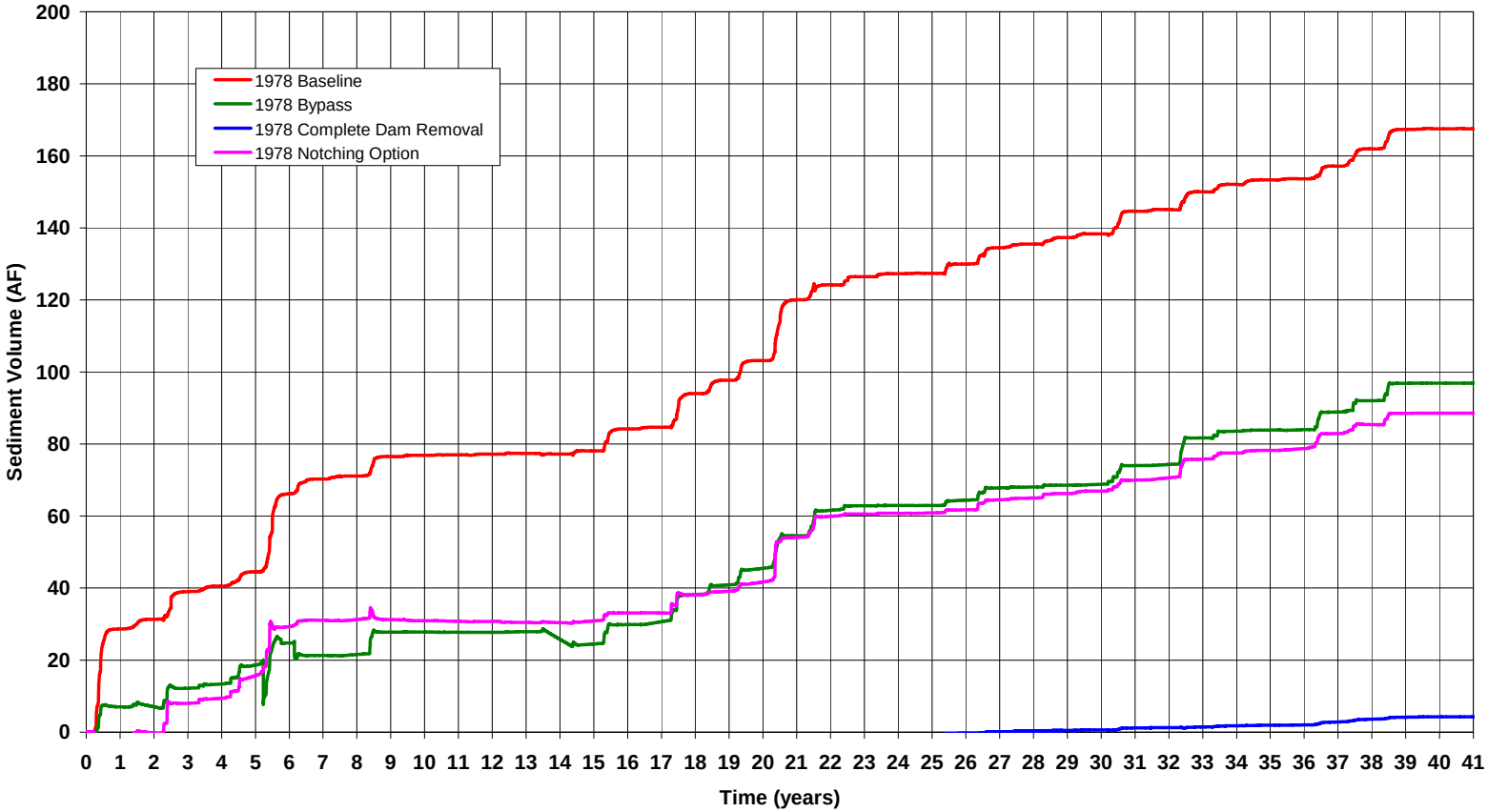


Figure 30. Total volume of sediment trapped in the reservoir (upstream of the existing dam) during the 41-year simulation for the baseline (with dam) conditions evaluated in MEI (2005) and for the Bypass, Complete Dam Removal, and Notching Alternatives in this study (1978 start date).

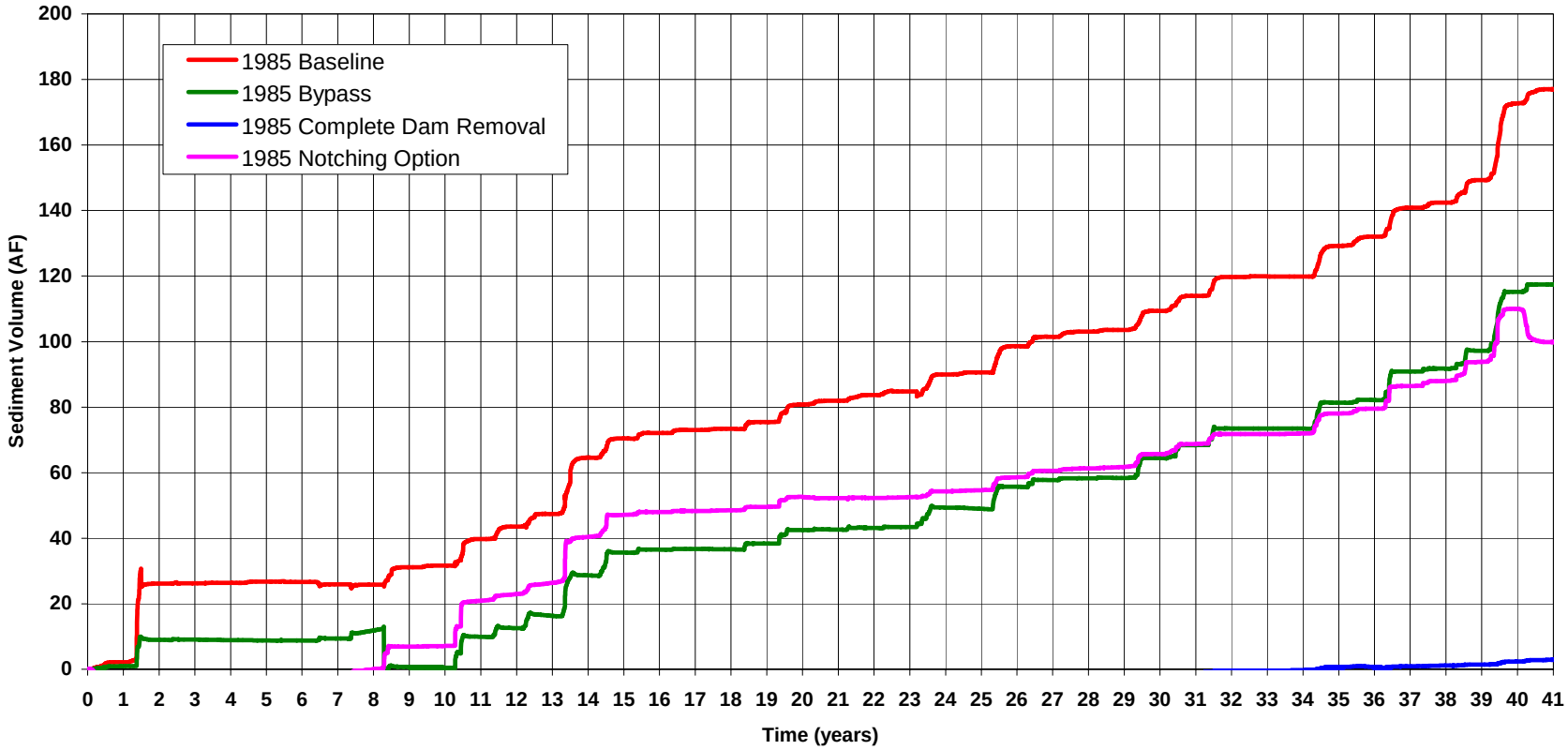


Figure 31. Total volume of sediment trapped in the reservoir (upstream of the existing dam) during the 41-year simulation for the baseline (with dam) conditions evaluated in MEI (2005) and for the Bypass, Complete Dam Removal, and Notching Alternatives in this study (1985 start date).

Table 3. Summary of subreaches used to evaluate model results (from MEI, 2002a).

Subreach Number	Upstream Station (ft)	Downstream Station (ft)	Subreach Length		Description	Average Gradient		Bed-Material Size (mm)		Model Cross Sections
			ft	miles		ft/ft	ft/mi	Median (D_{50})	D_{84}	
4.3	101,400	92,400	9,000	1.70	San Clemente Dam to Sleepy Hollow	0.0099	52.1	203	293	207 to 232
4.7	92,400	85,800	6,600	1.25	Sleepy Hollow to Tularcitos Creek	0.0079	41.5	152	227	189 to 206
5	85,800	78,800	7,000	1.33	Tularcitos Creek to Hitchcock Canyon	0.0067	35.3	161	230	168 to 188
6.3	78,800	67,000	11,800	2.23	Hitchcock Canyon to Garza Creek	0.0055	29.0	103	176	142 to 167
6.7	67,000	54,100	12,900	2.44	Garzas Creek to Randazzo Bridge	0.0048	25.4	86	155	115 to 141
7.3	54,100	42,900	11,200	2.12	Randazzo Bridge to Robinson Canyon	0.0035	18.7	75	121	93 to 114
7.7	42,900	35,400	7,500	1.42	Robinson Canyon to Schulte Road	0.0029	15.1	53	88	77 to 92
8.3	35,400	25,400	10,000	1.89	Schulte Road to Valley Green Bridge	0.0025	13.2	38	65	55 to 76
8.7	25,400	5,900	19,500	3.69	Valley Green Bridge to Highway 1	0.0021	11.2	1.8	6.2	14 to 54
9	5,900	0	5,900	1.12	Highway 1 to mouth	0.0009	4.5	1.5	4.9	0.5 to 13
Total Length			**101,400**	**19.2**						

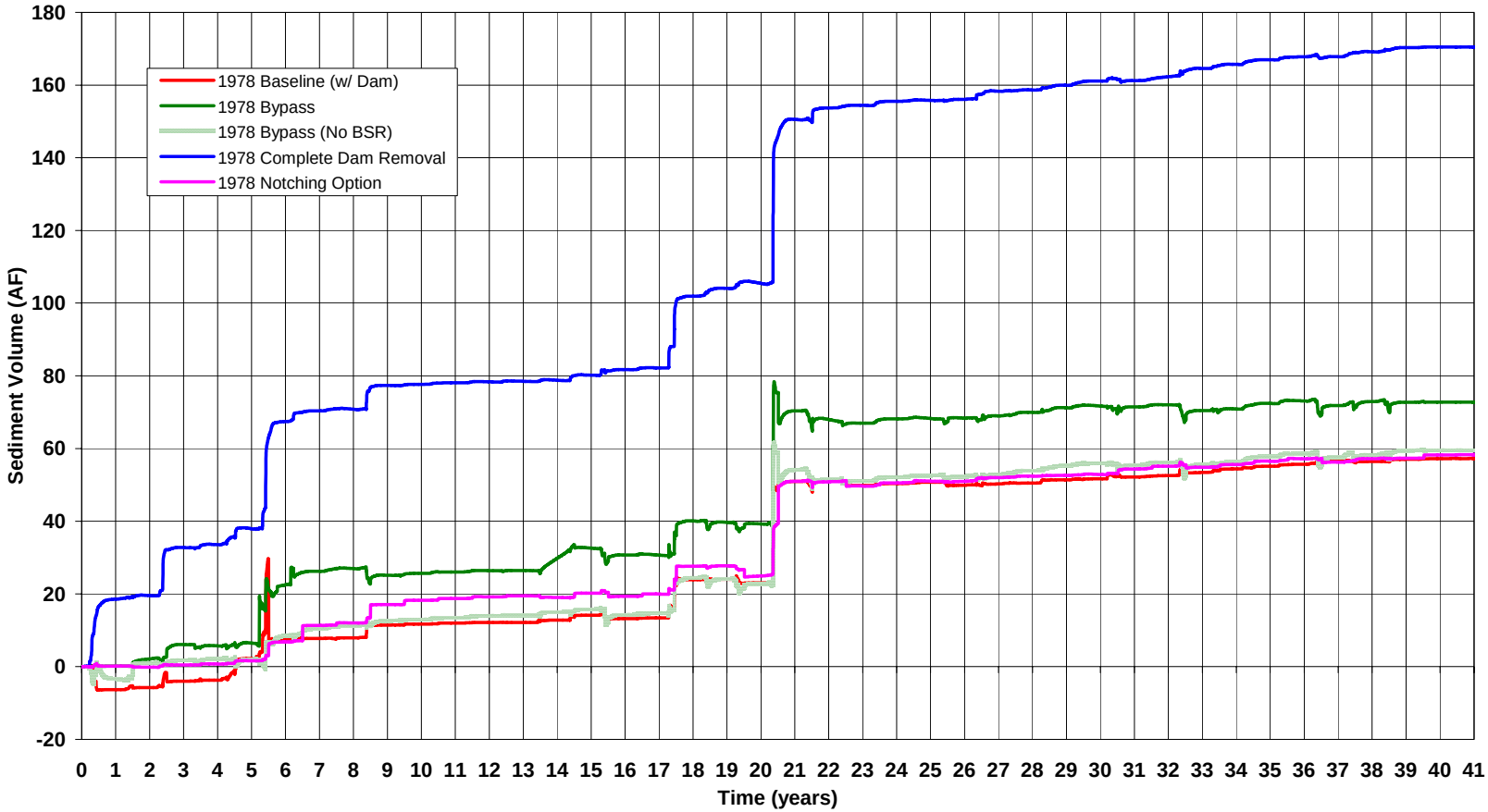


Figure 32. Total volume of sediment stored in the Carmel River downstream from San Clemente Dam for the 41-year simulation under baseline (with dam) conditions evaluated in MEI (2005) and for the Alternatives evaluated in this study (1978 start date).

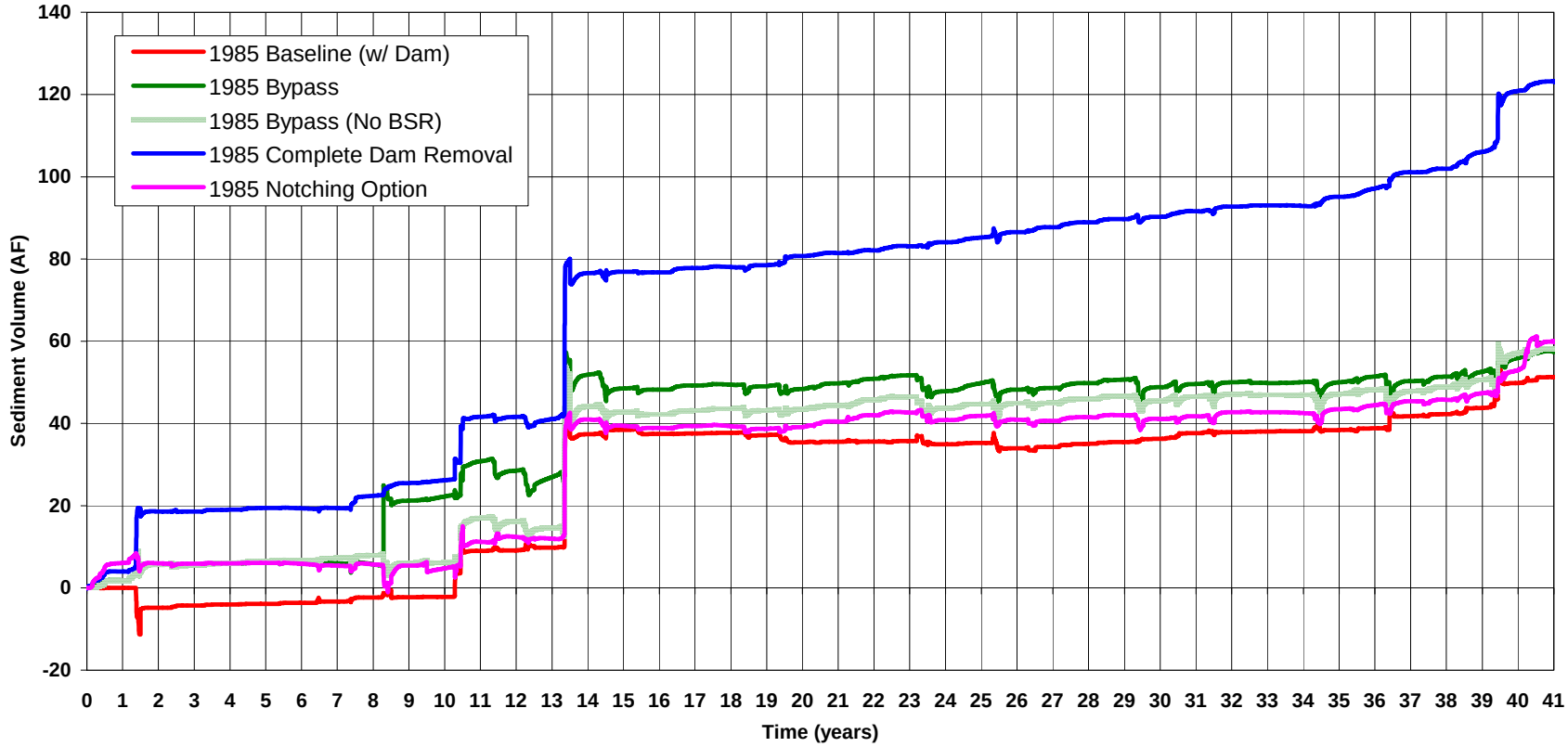


Figure 33. Total volume of sediment stored in the Carmel River downstream from San Clemente Dam for the 41-year simulation under baseline (with dam) conditions evaluated in MEI (2005) and for the Alternatives evaluated in this study (1985 start date).

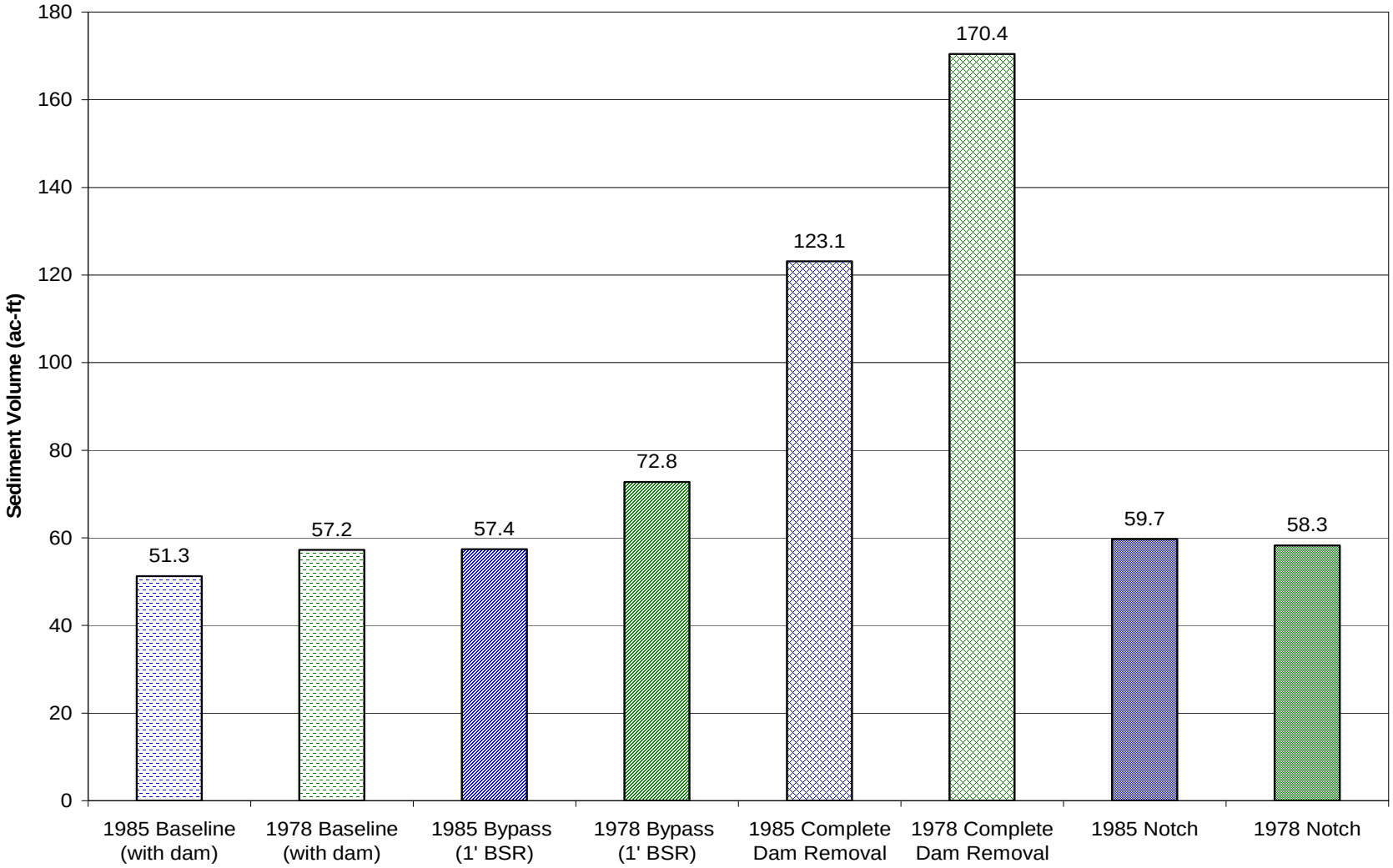


Figure 34. Total volume of sediment stored in the downstream Carmel River for the baseline (with dam) scenario (MEI, 2005) and the alternatives evaluated in this study.

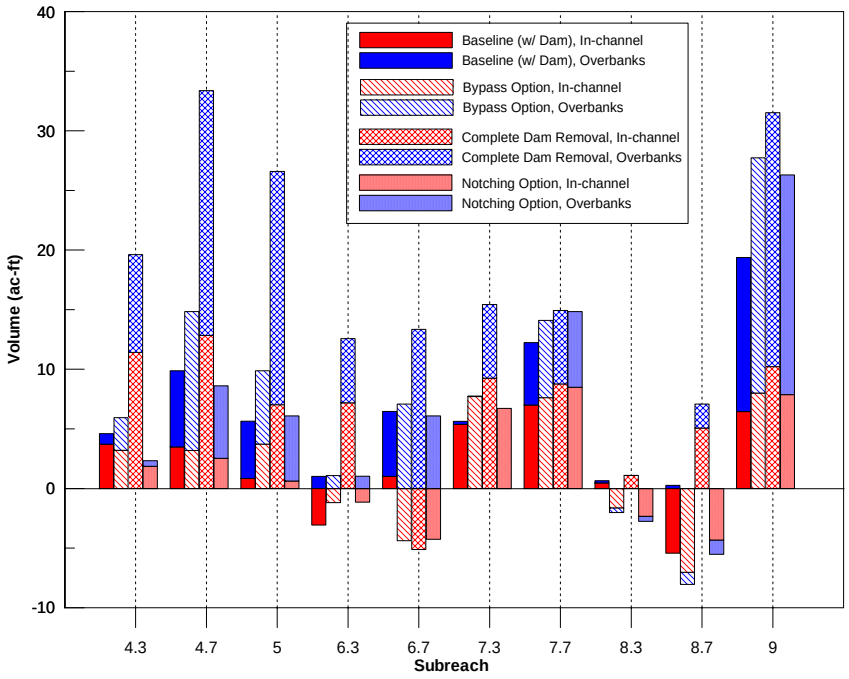


Figure 35a. Sediment volume stored in the river downstream from San Clemente Dam at the end of the 41-year simulation, by subreach, for the baseline (with dam) conditions evaluated in MEI (2005) and for the alternatives evaluated in this study (1978 start-date).

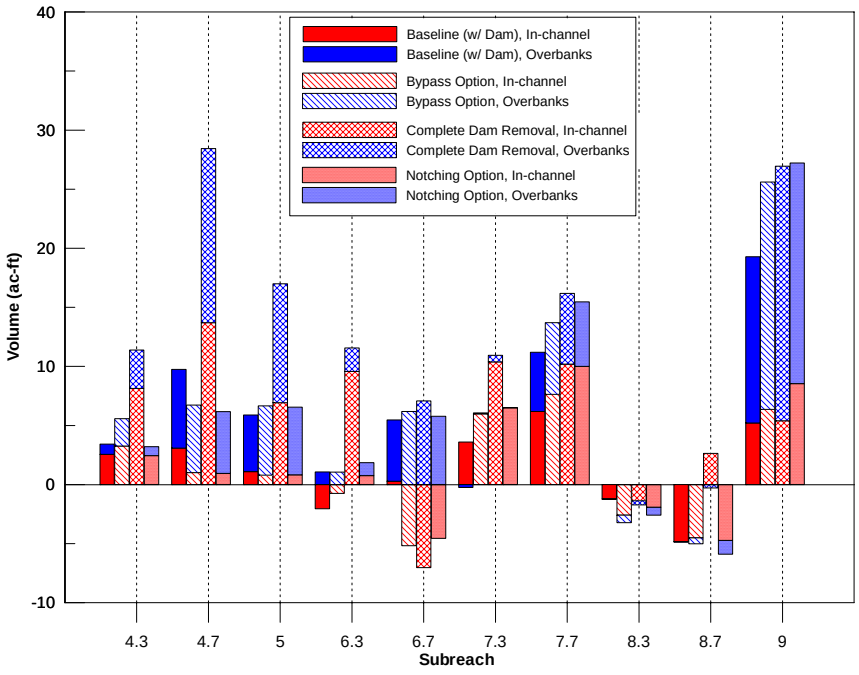


Figure 35b. Sediment volume stored in the river downstream from San Clemente Dam at the end of the 41-year simulation, by subreach, for the baseline (with dam) conditions evaluated in MEI (2005) and for the alternatives evaluated in this study (1985 start-date).

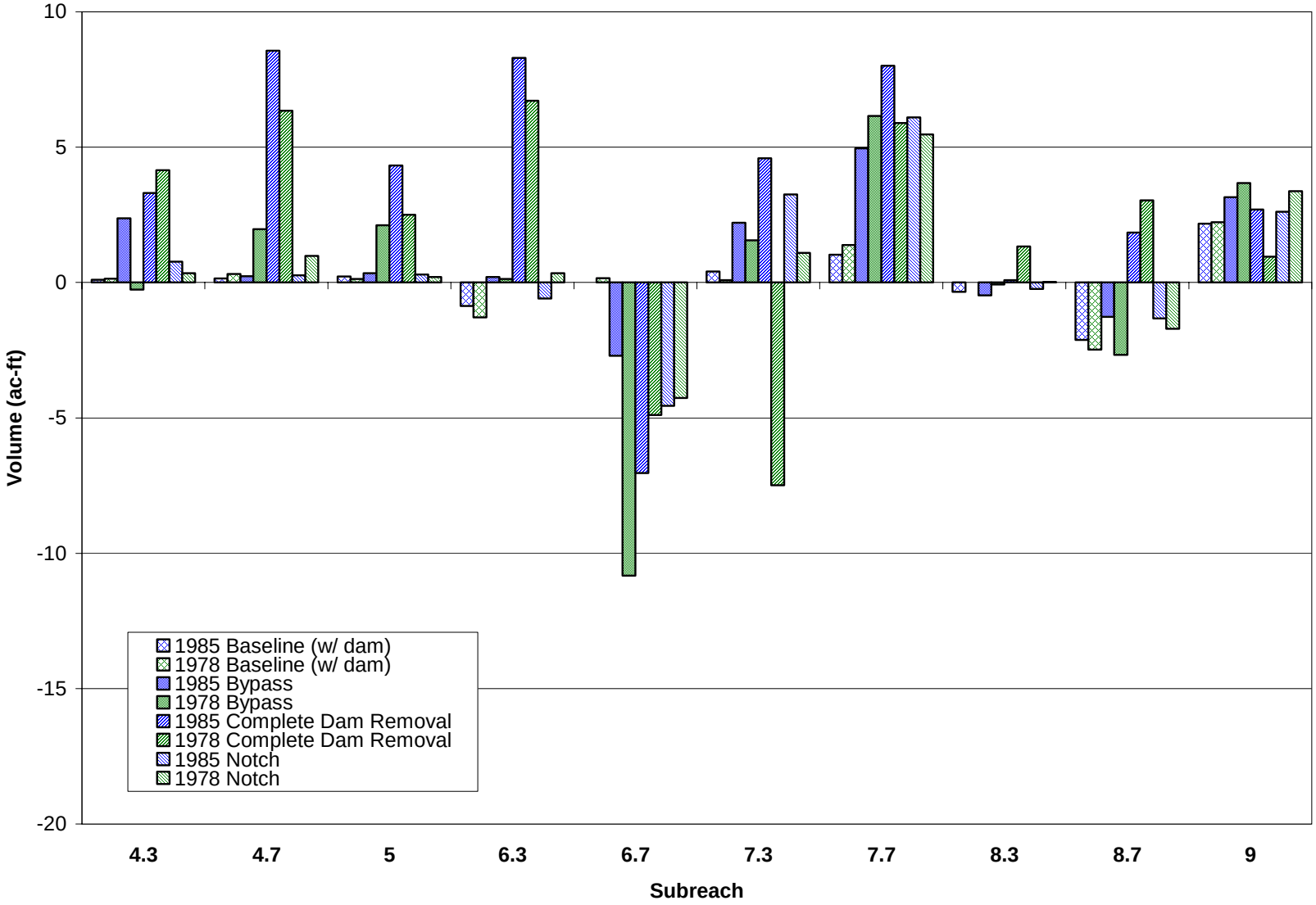


Figure 36. Volume of gravels stored in the main channel in each of the subreaches under the baseline (with dam) conditions evaluated in MEI (2005) and under the alternatives evaluated in this study.

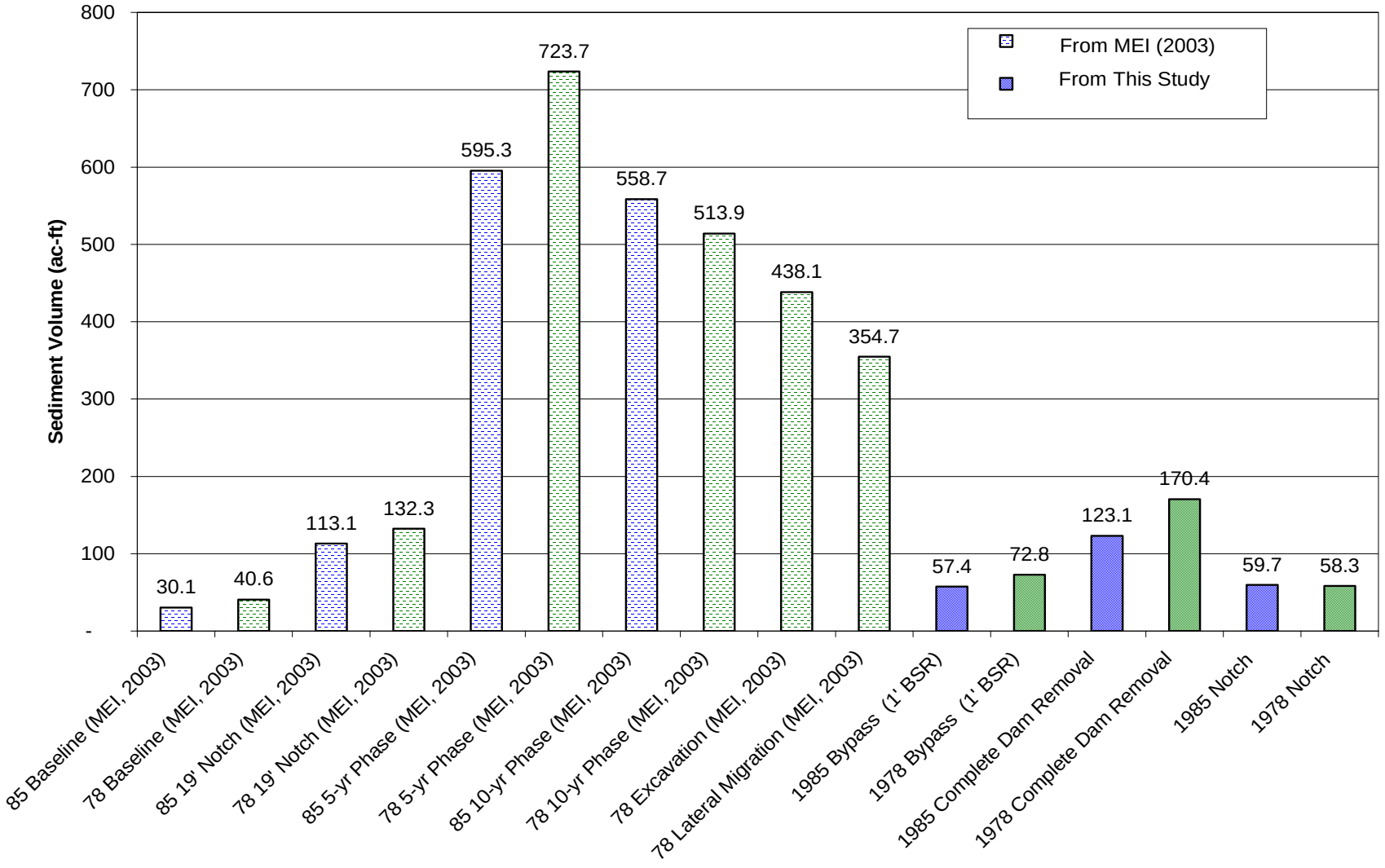


Figure 37. Comparison of total sediment volume stored in the Carmel River below the existing dam location at the end of the 41-year simulation under scenarios evaluated in MEI (2003) and evaluated for this study.

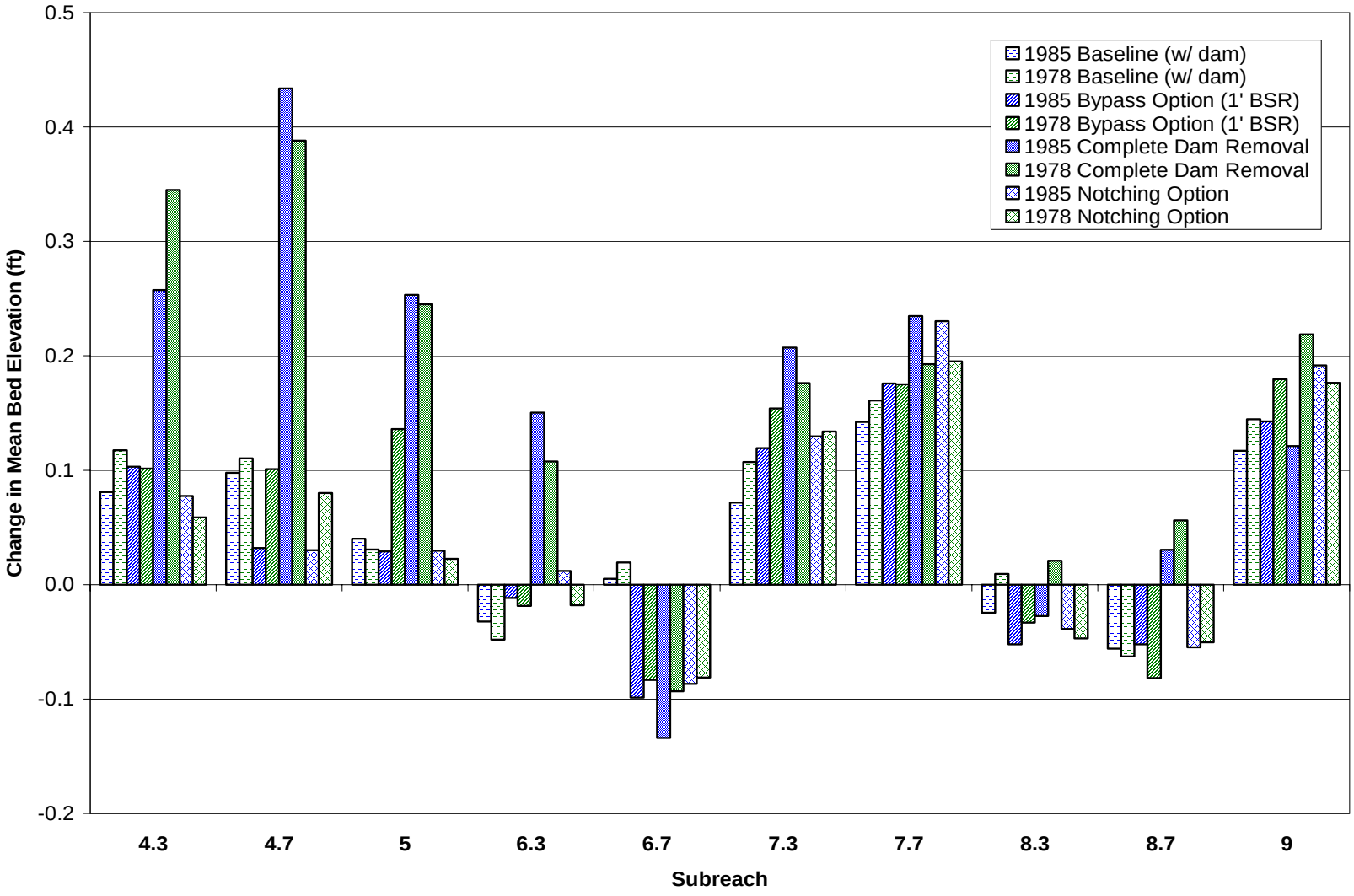


Figure 38. Change in mean bed elevation at the end of the simulation for each of the subreaches under the baseline (with dam) conditions evaluated in MEI (2005) and under the alternatives evaluated in this study.

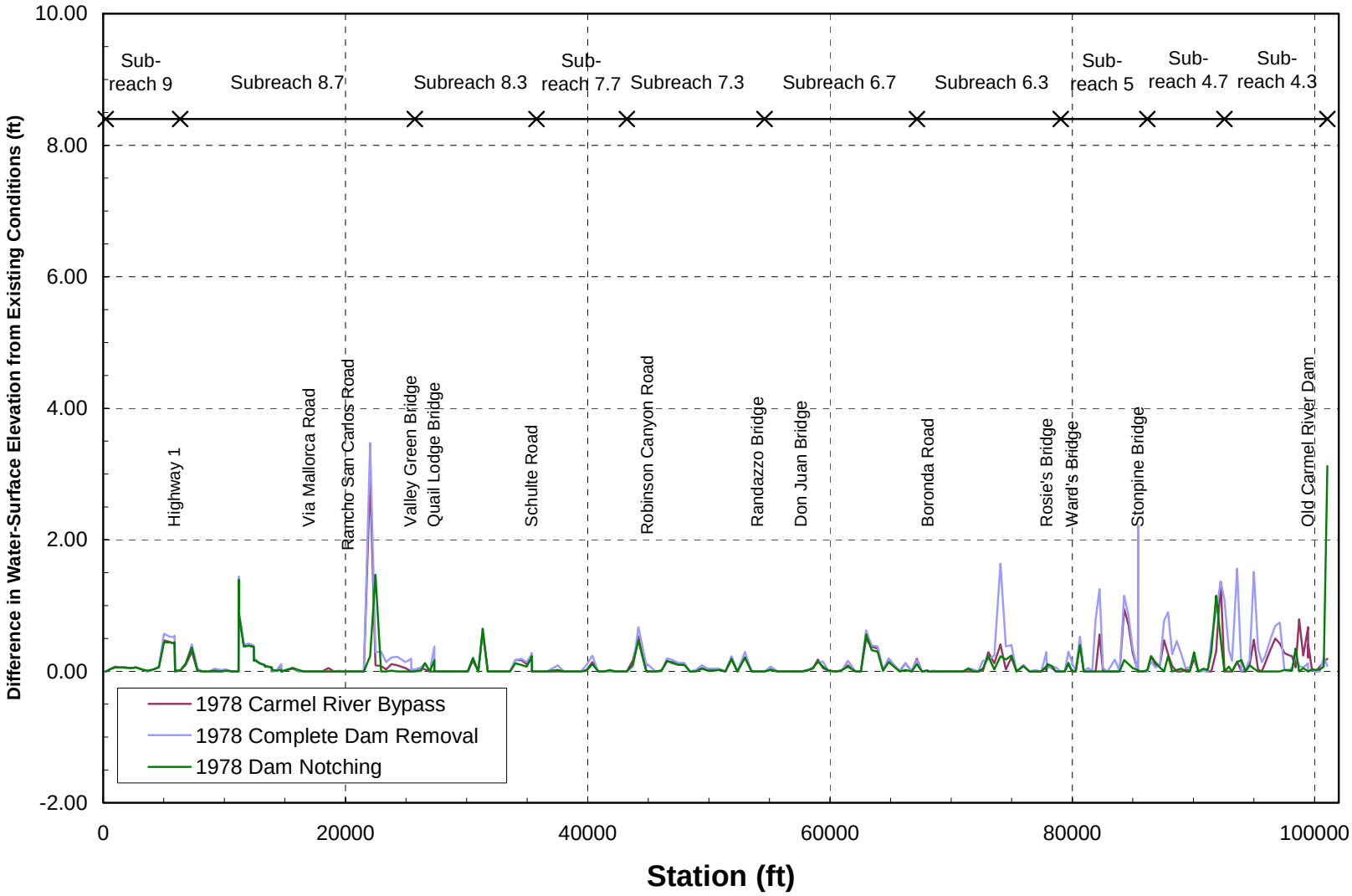


Figure 39. Maximum difference in 100-year water-surface elevation from existing conditions for the alternatives evaluated in this study (1978 start date).

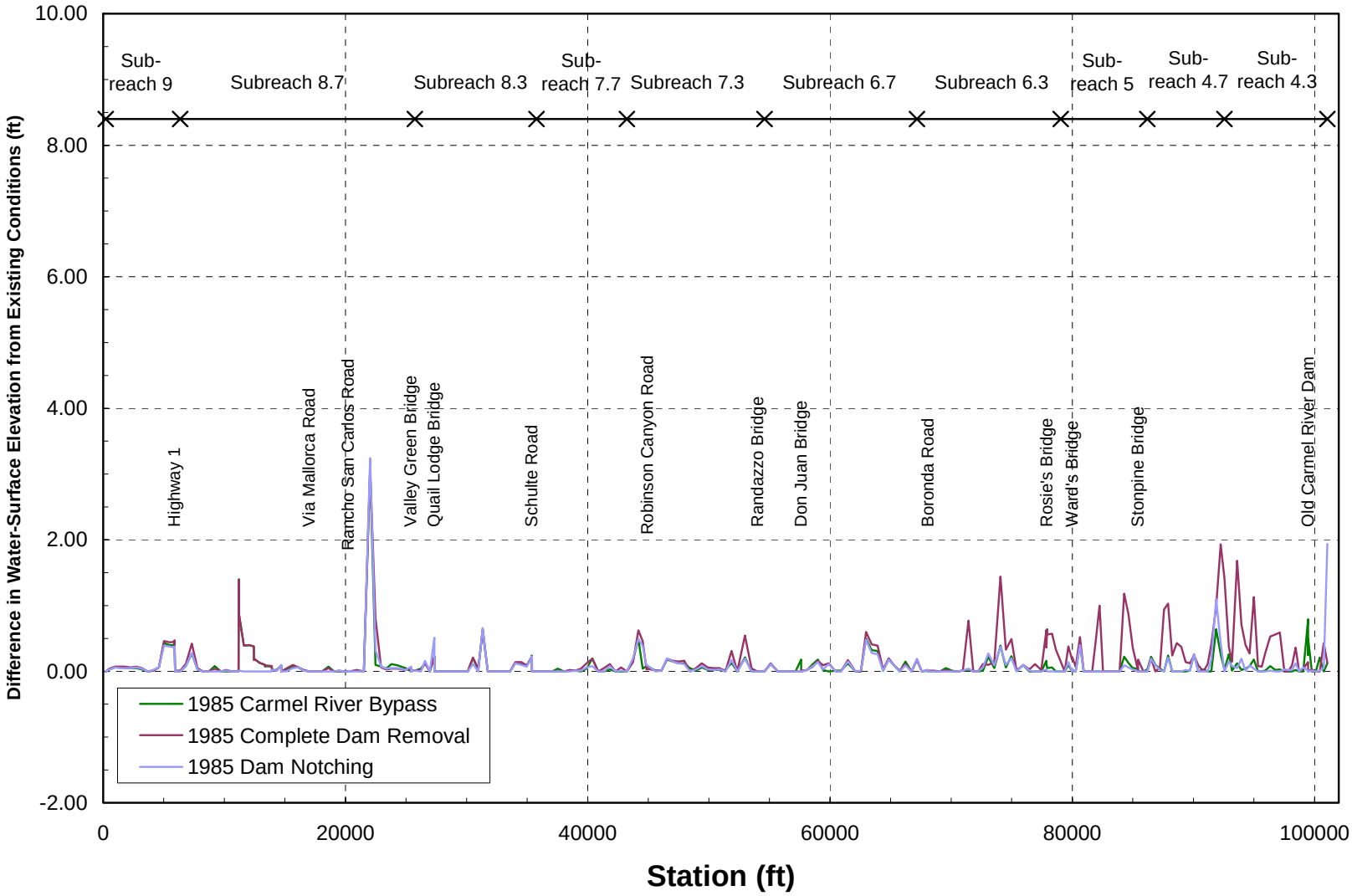


Figure 40. Maximum difference in 100-year water-surface elevation from existing conditions for the alternatives evaluated in this study (1985 start date).

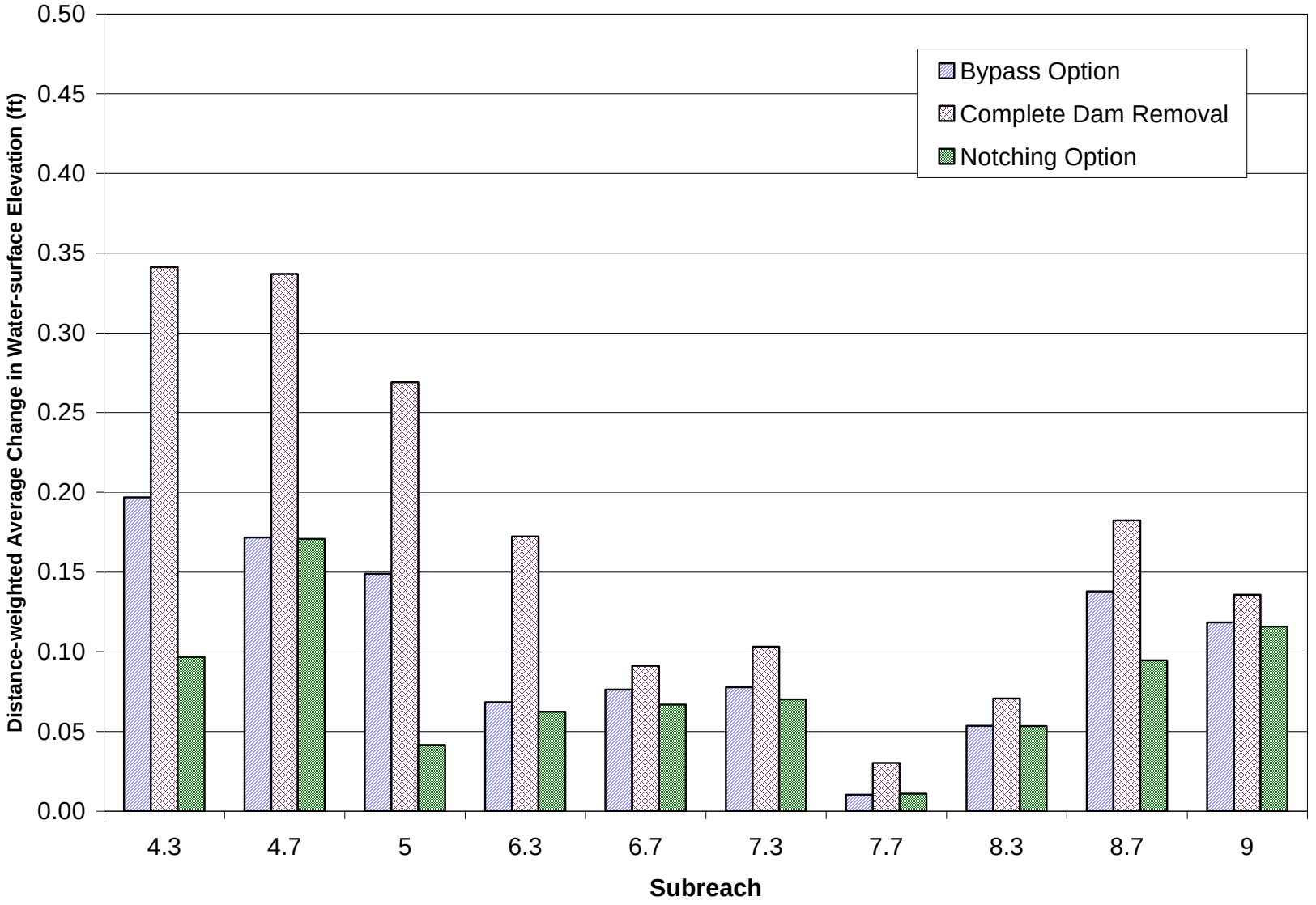


Figure 41. Distance-weighted average difference in maximum 100-year water-surface elevation from existing conditions, by subreach, for the alternatives evaluated in this study (1978 start date).

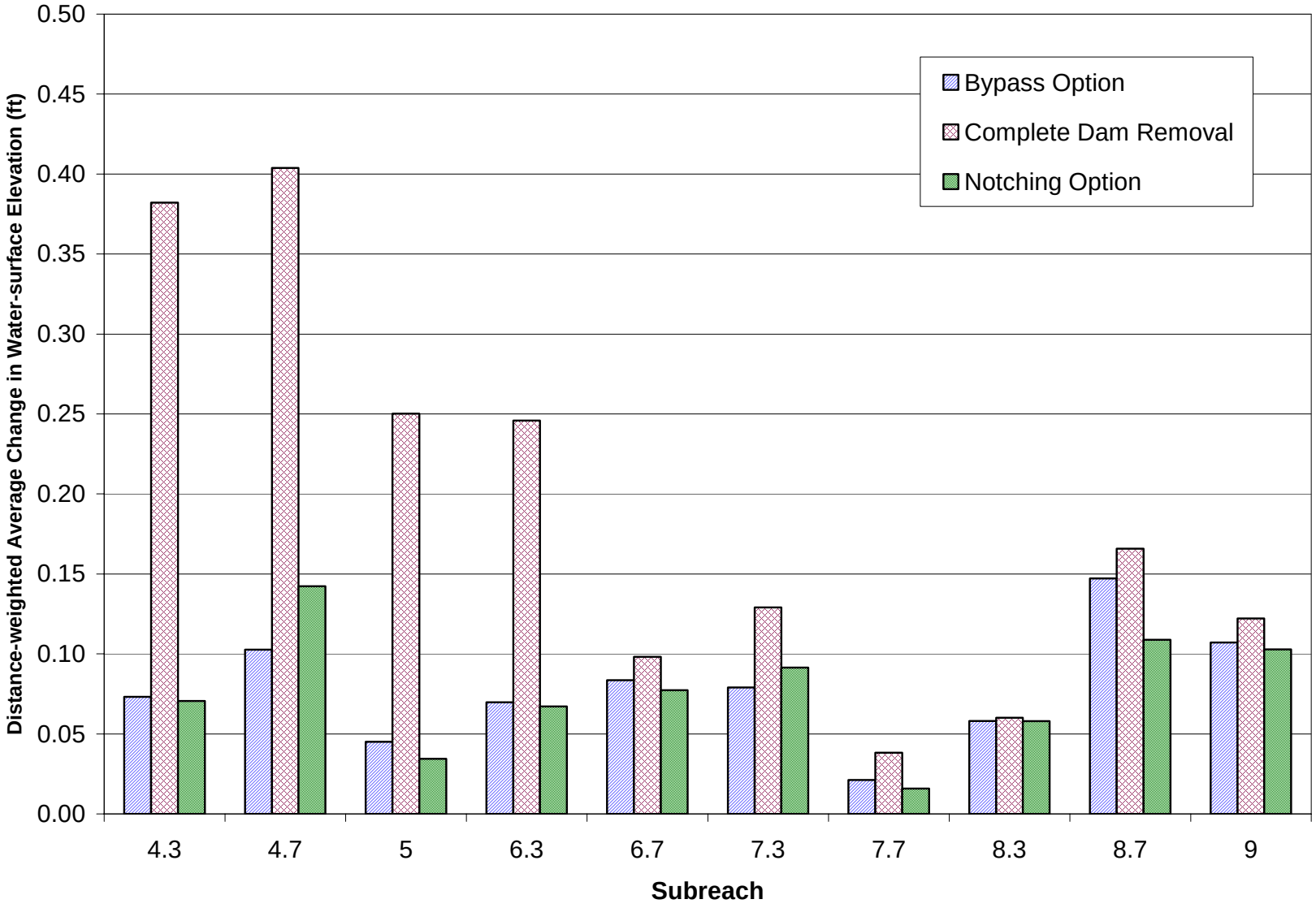


Figure 42. Distance-weighted average difference in maximum 100-year water-surface elevation from existing conditions, by subreach, for the alternatives evaluated in this study (1985 start date).

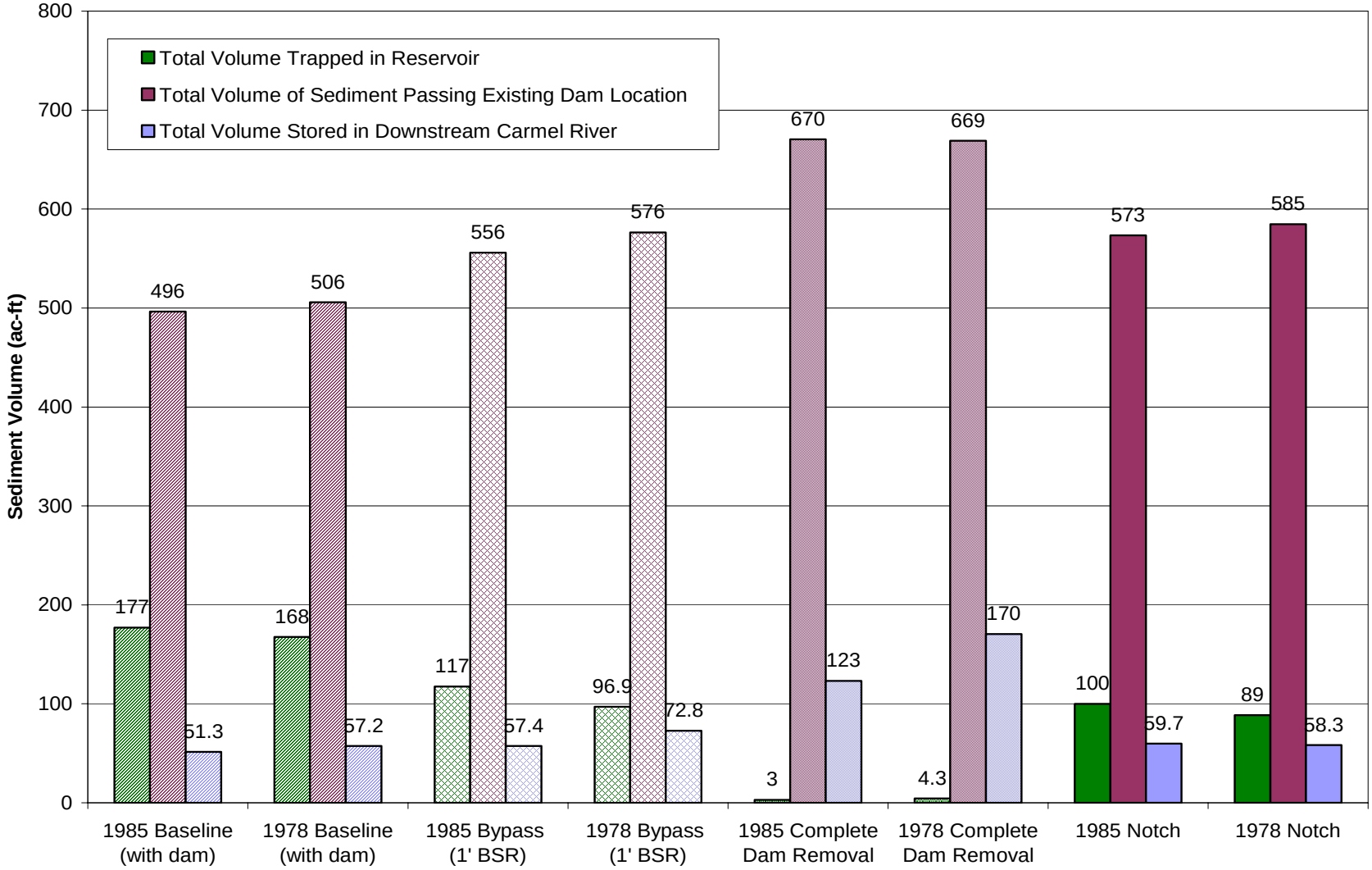


Figure 43. Summary of sediment-transport modeling results at the end of the 41-year simulation.

Appendix O

SUSPENDED SEDIMENT CONCENTRATION ASSOCIATED WITH A SLUICE EVENT

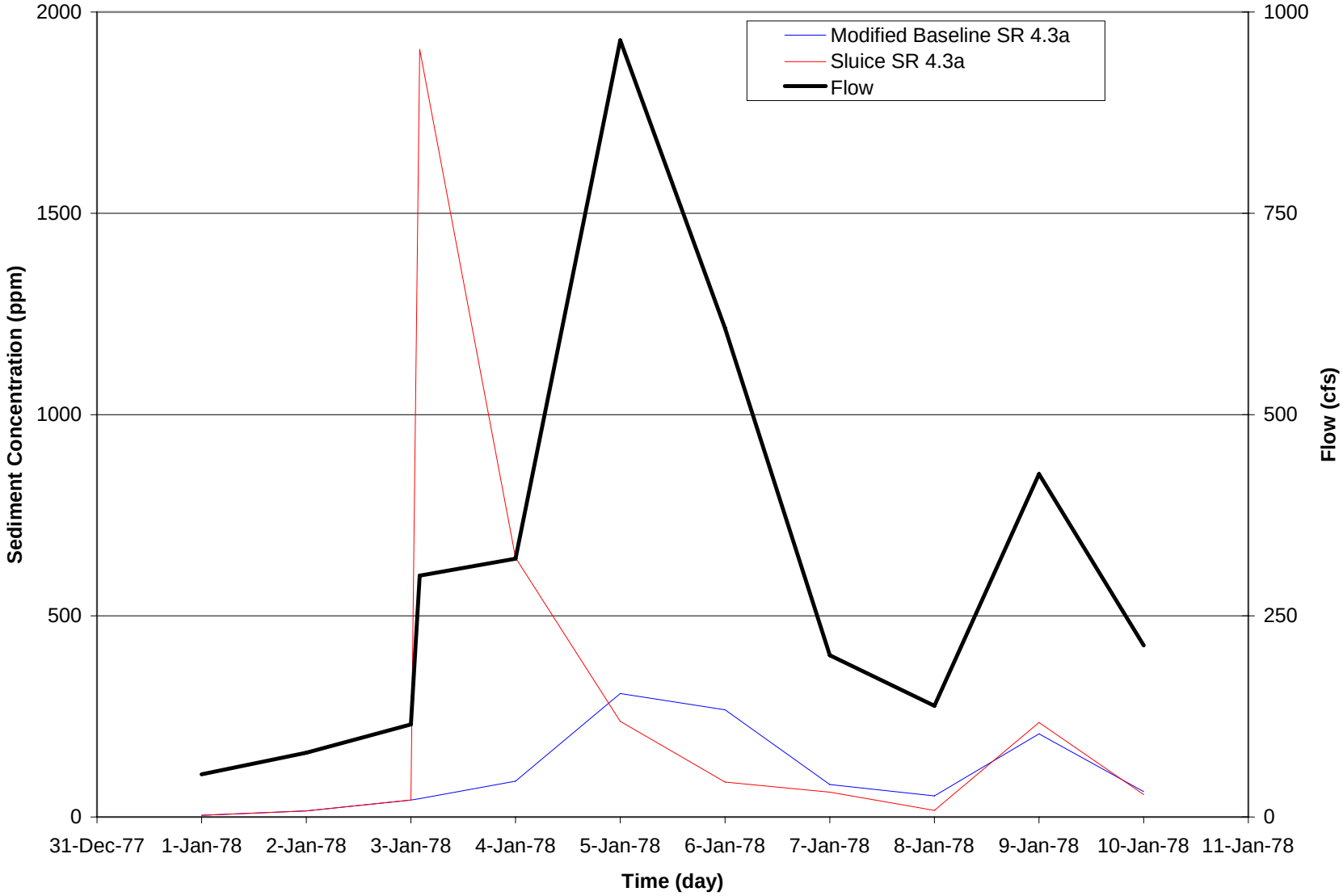


Figure O-1: Simulated Suspended Sediment Concentration at Reach 4.3 for a Wet Year

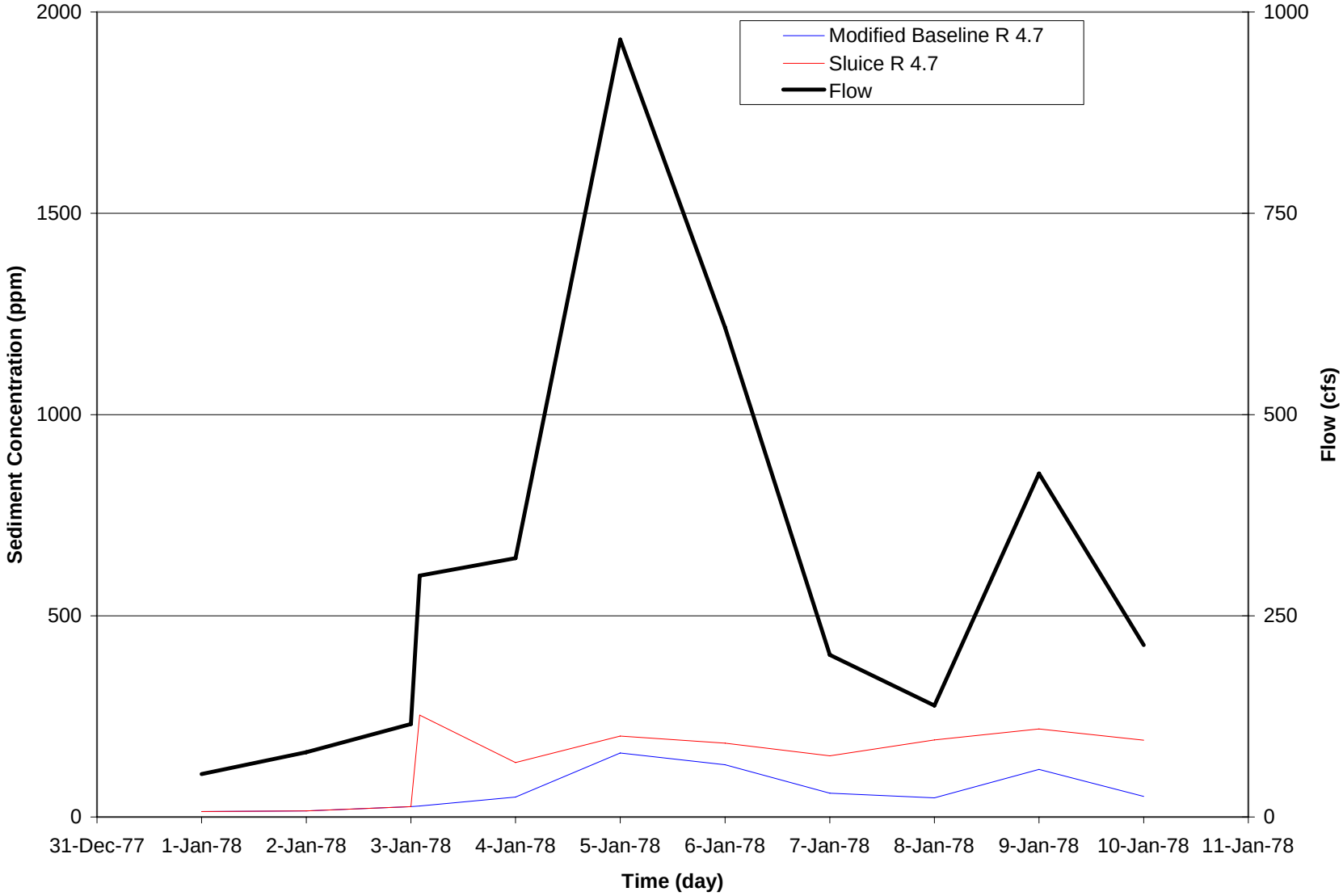


Figure O-2: Simulated Suspended Sediment Concentration at Reach 4.7 for a Wet Year

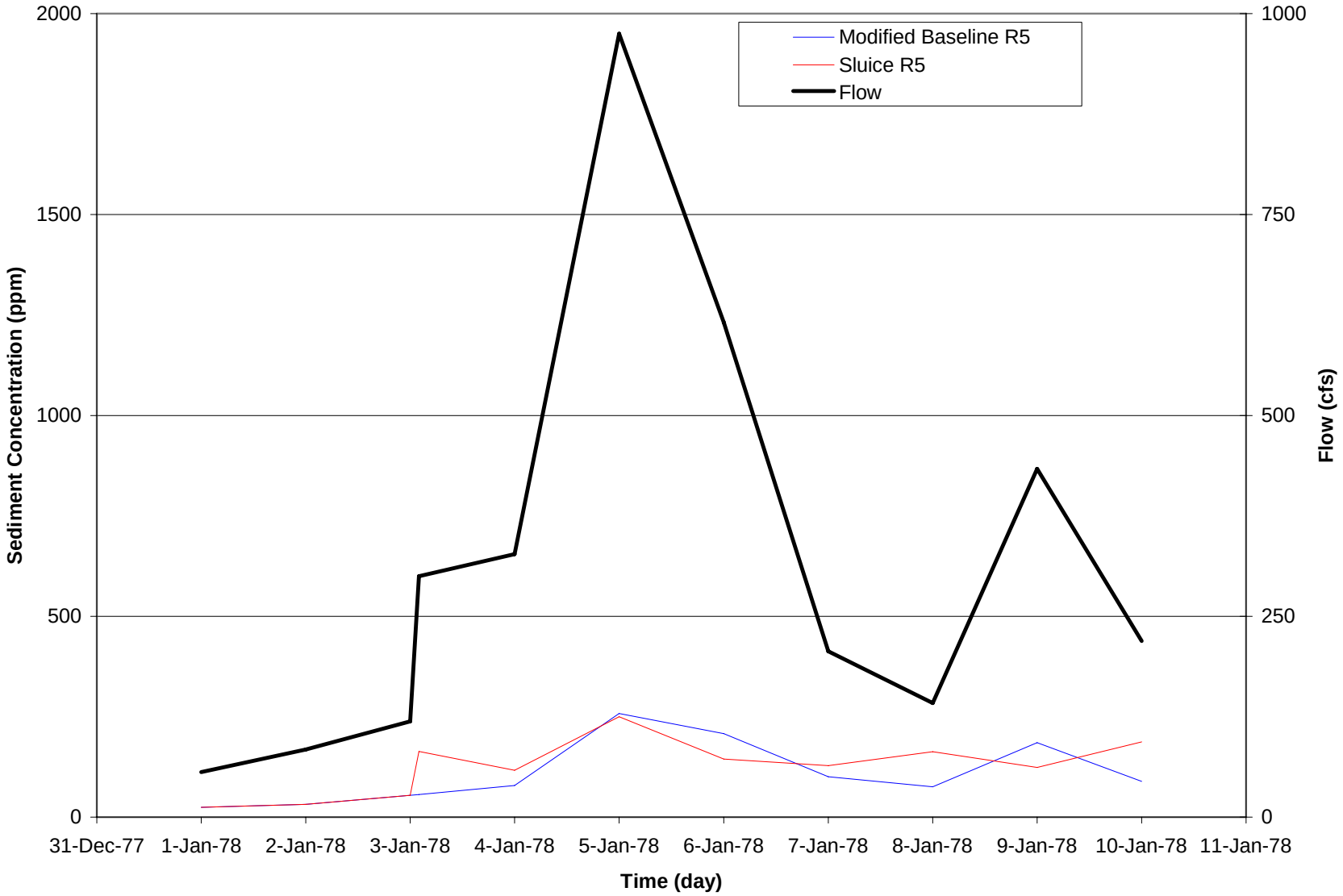


Figure O-3: Simulated Suspended Sediment Concentration at Reach 5 for a Wet Year

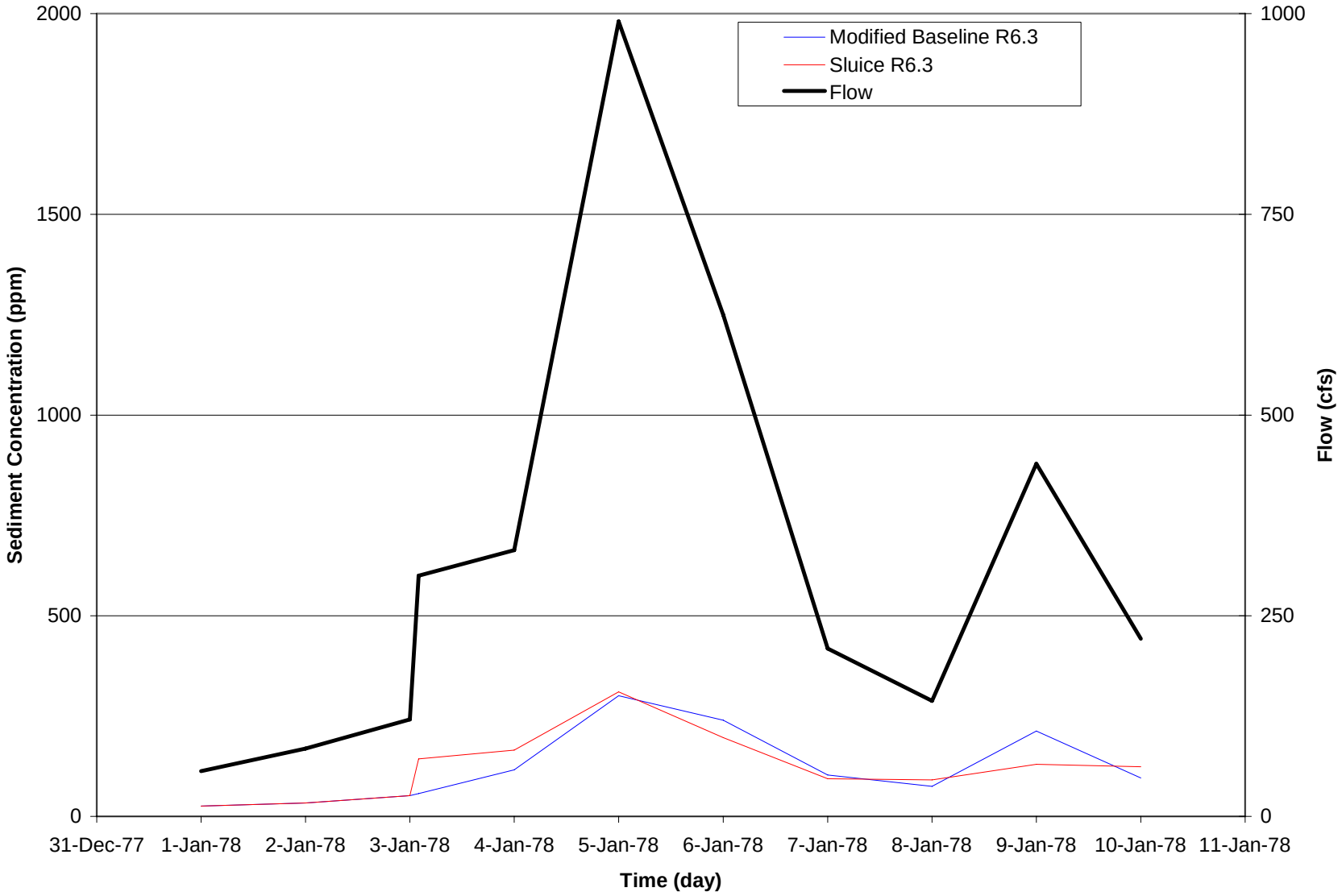


Figure O-4: Simulated Suspended Sediment Concentration at Reach 6.3 for a Wet Year

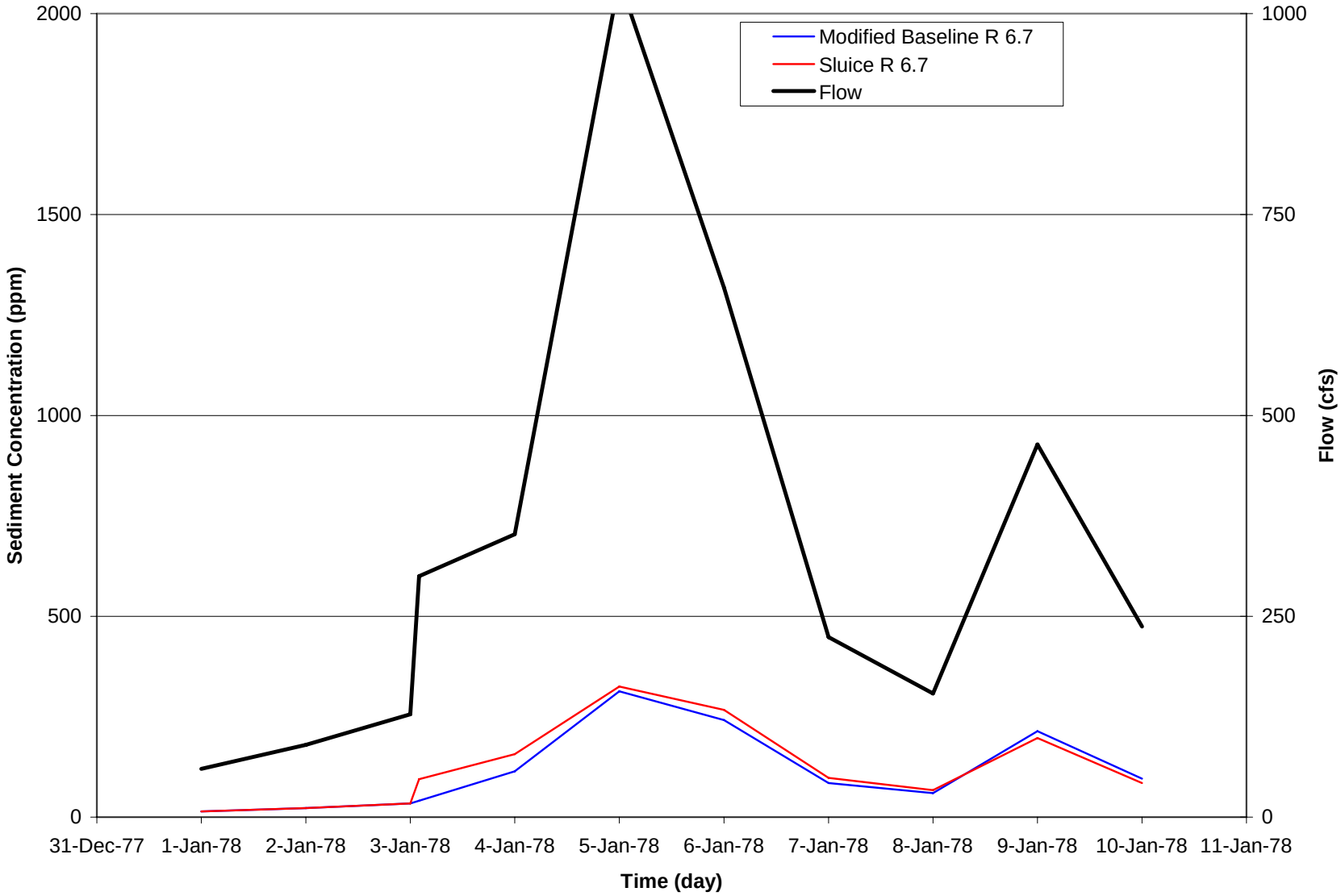


Figure O-5: Simulated Suspended Sediment Concentration at Reach 6.7 for a Wet Year

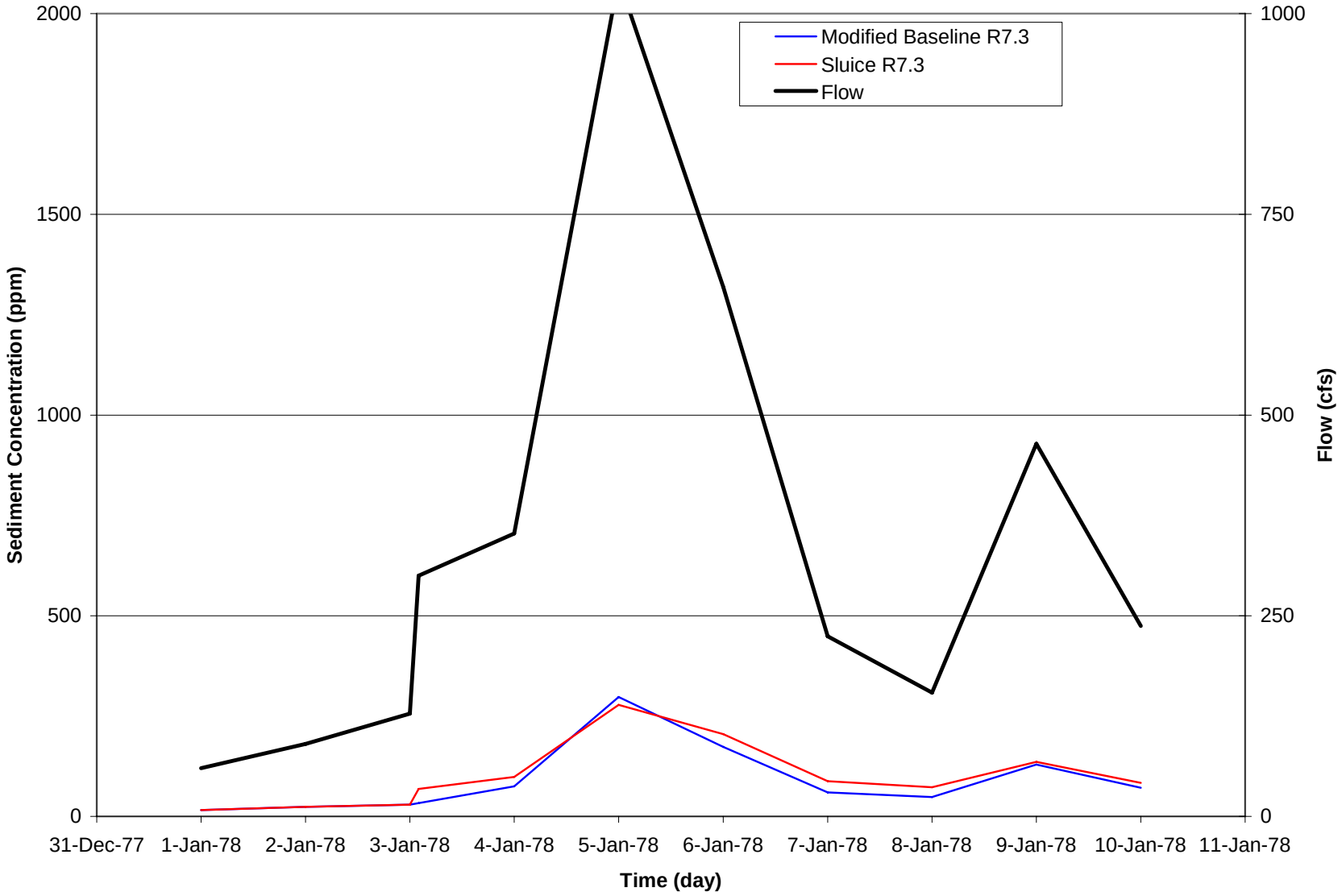


Figure O-6: Simulated Suspended Sediment Concentration at Reach 7.3 for a Wet Year

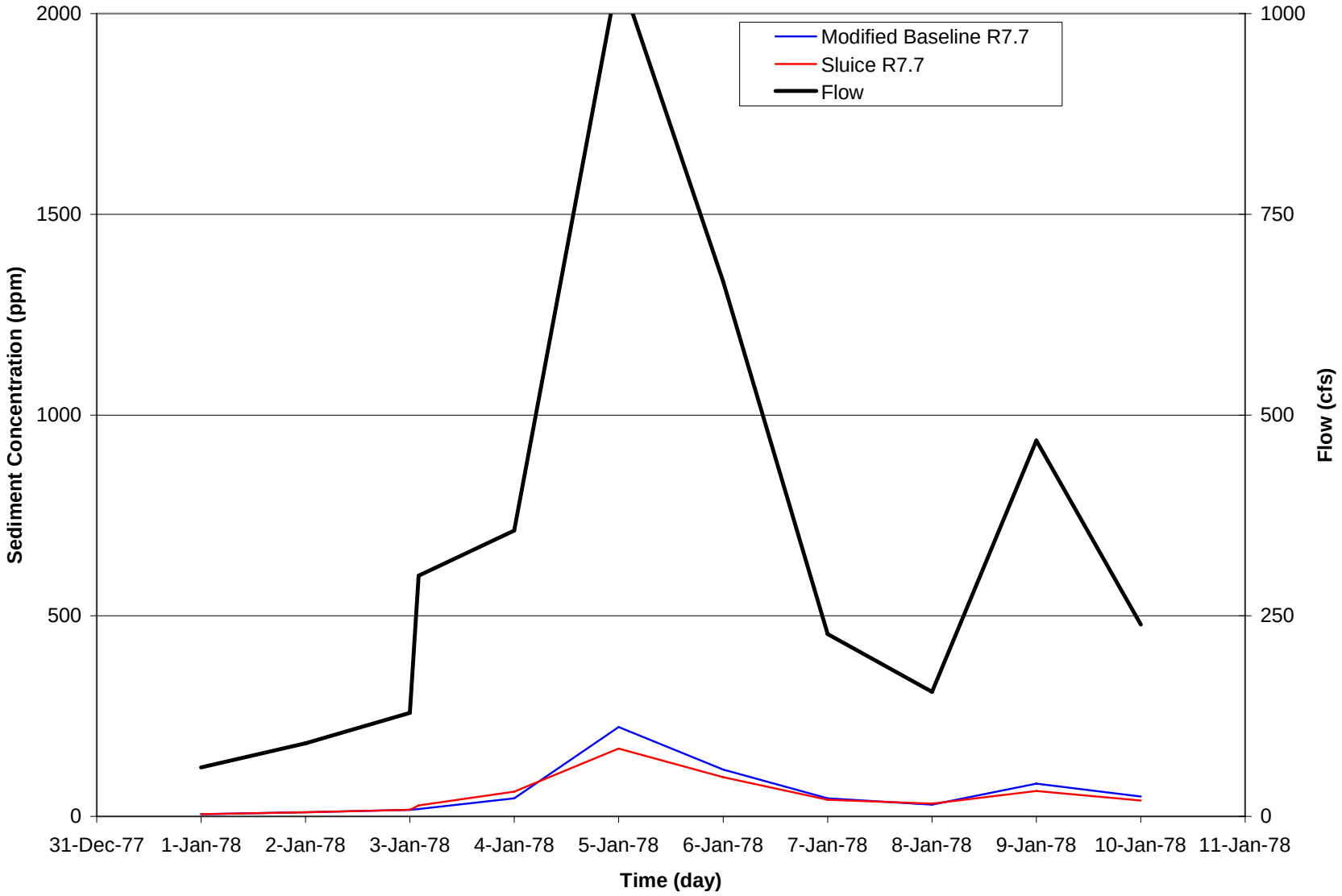


Figure O-7: Simulated Suspended Sediment Concentration at Reach 7.7 for a Wet Year

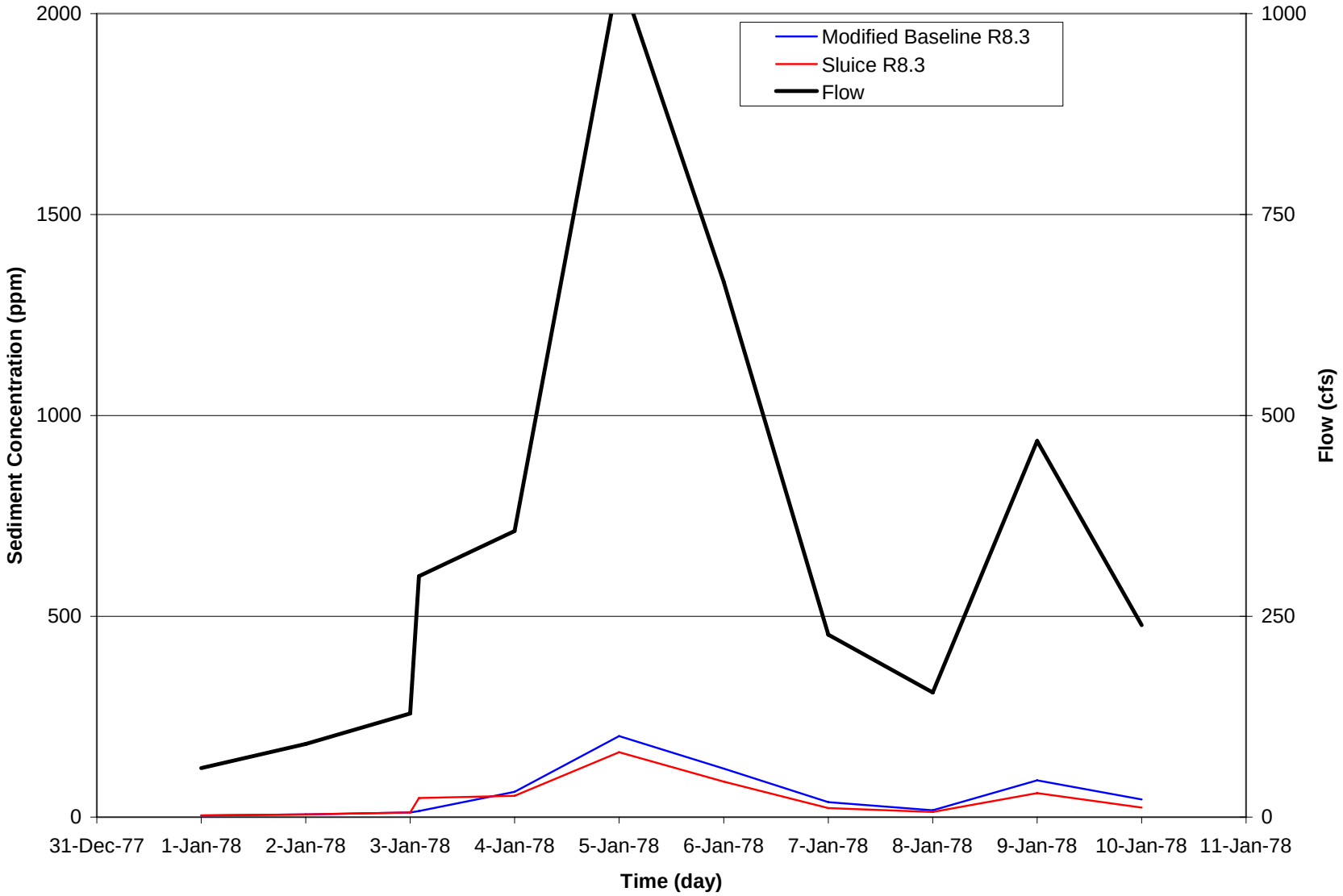


Figure O-8: Simulated Suspended Sediment Concentration at Reach 8.3 for a Wet Year

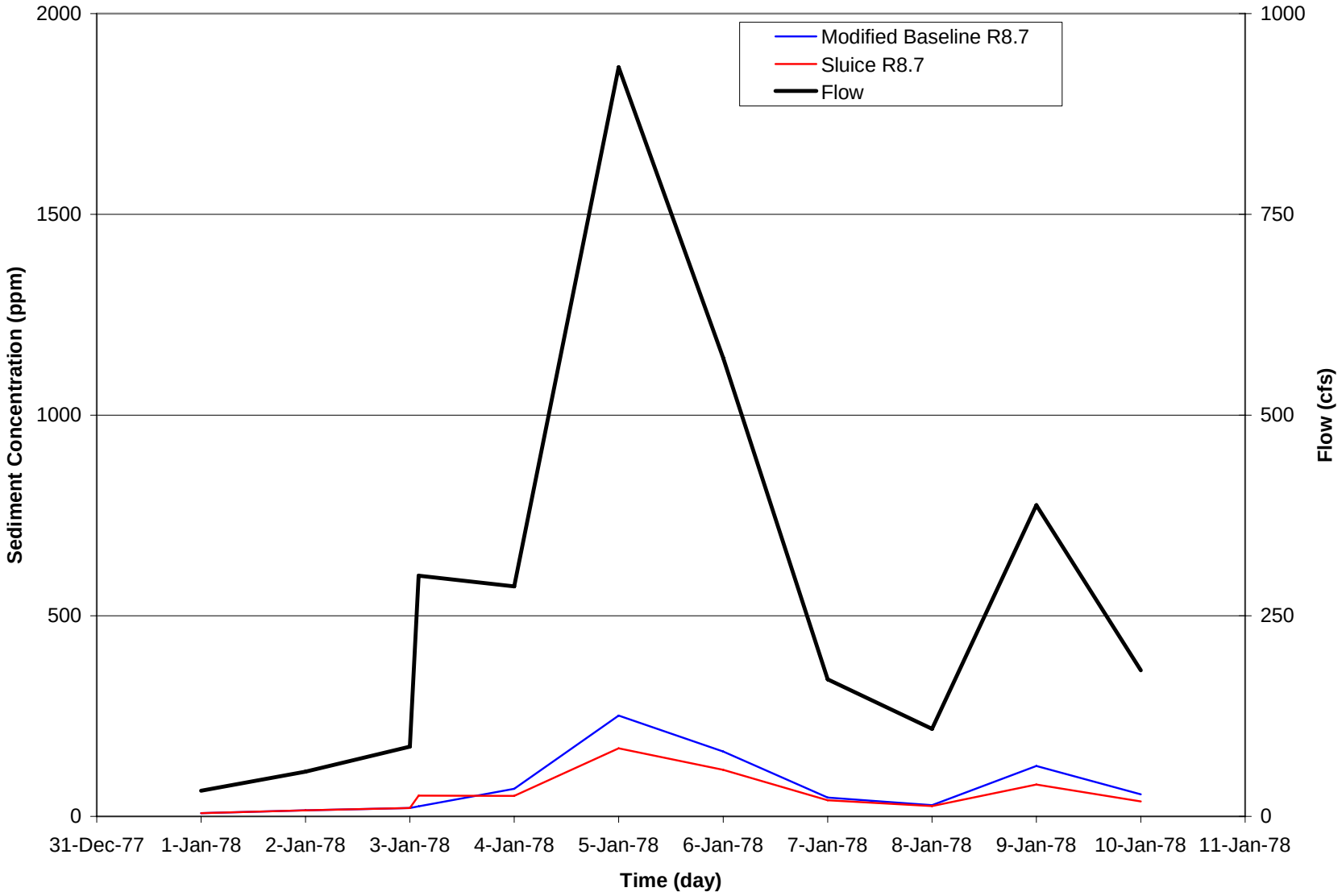


Figure O-9: Simulated Suspended Sediment Concentration at Reach 8.7 for a Wet Year

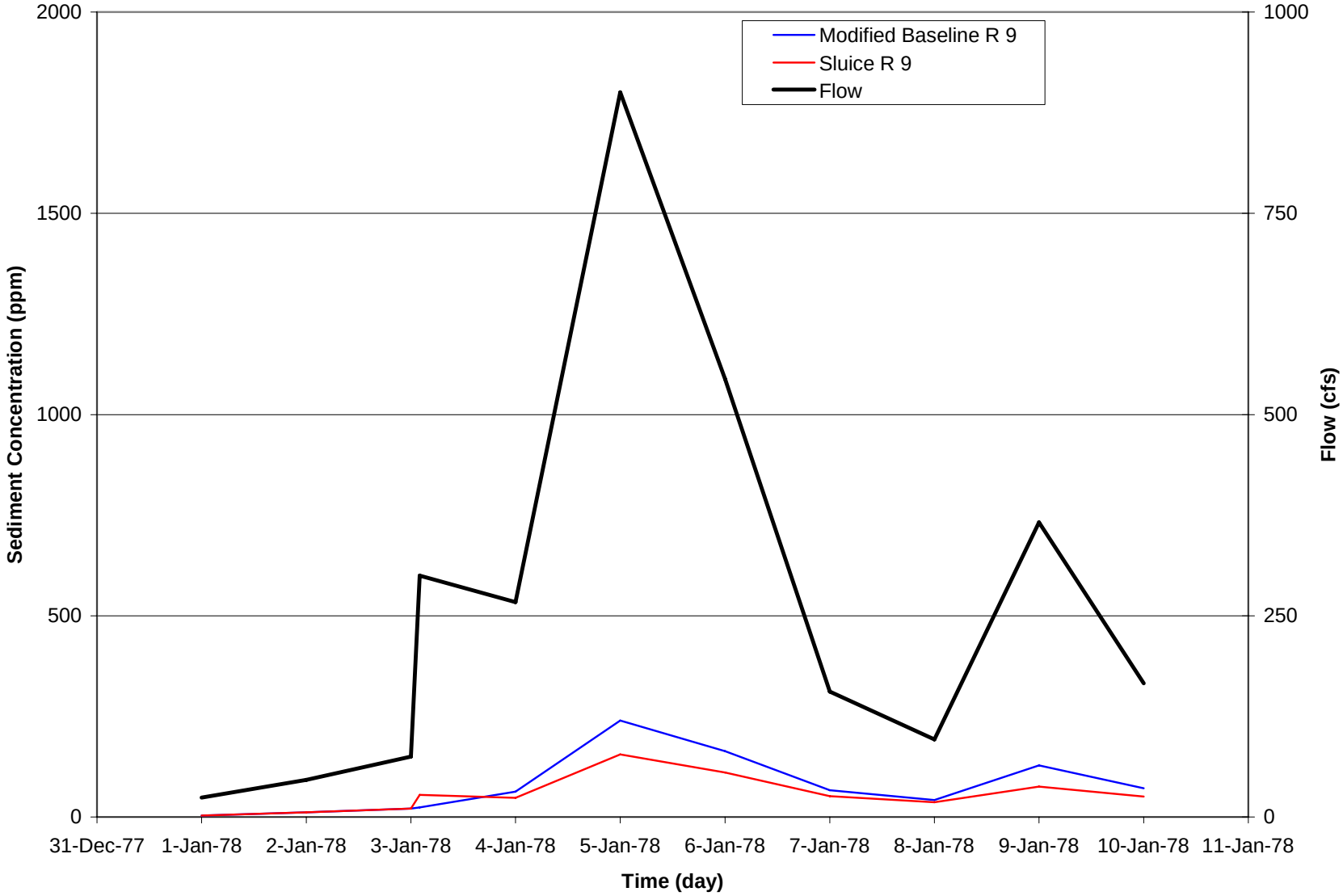


Figure O-10: Simulated Suspended Sediment Concentration at Reach 9 for a Wet Year

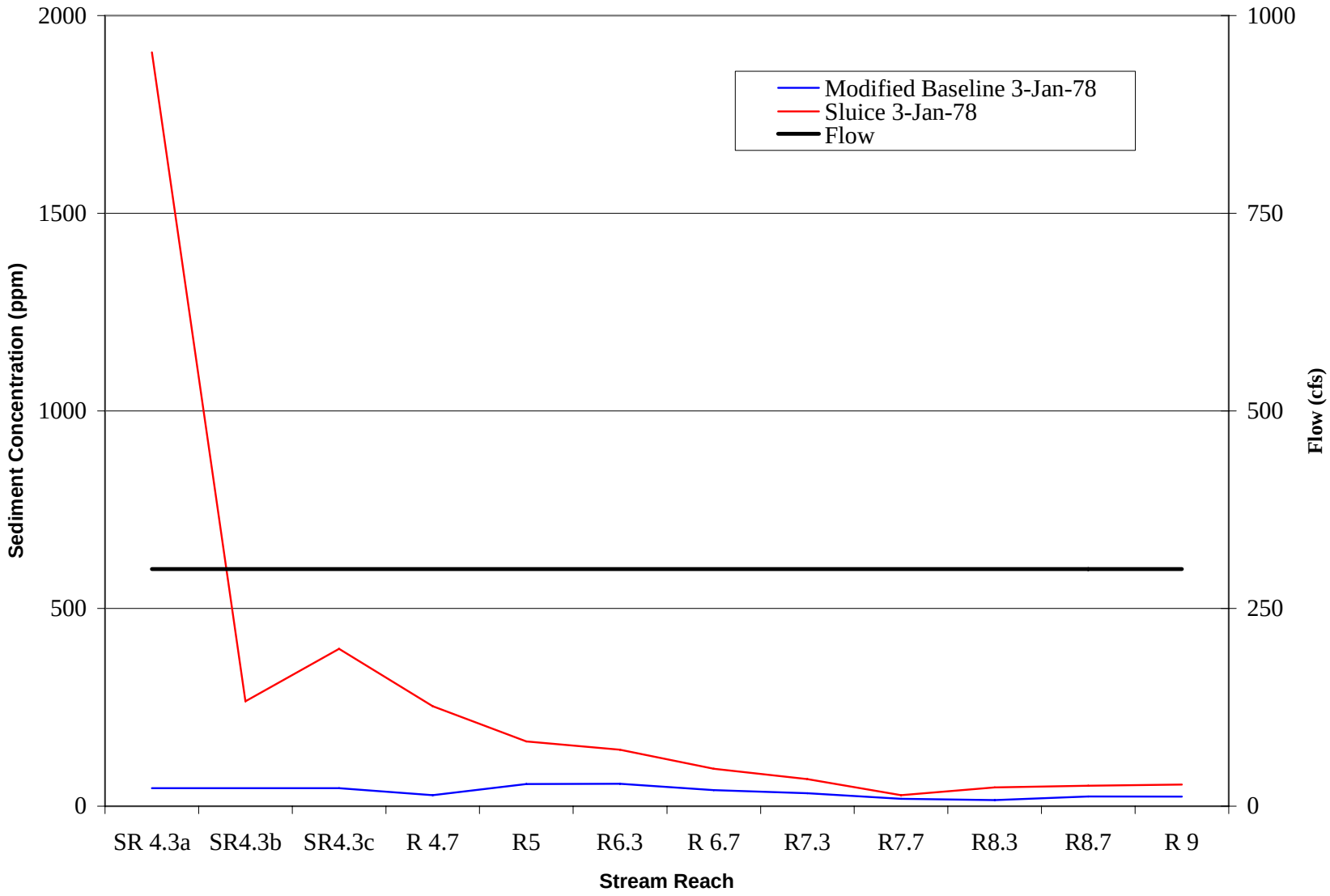


Figure O-11: Simulated Suspended Sediment Concentration along Carmel River for Day 1 of a Wet Year Sluice Event

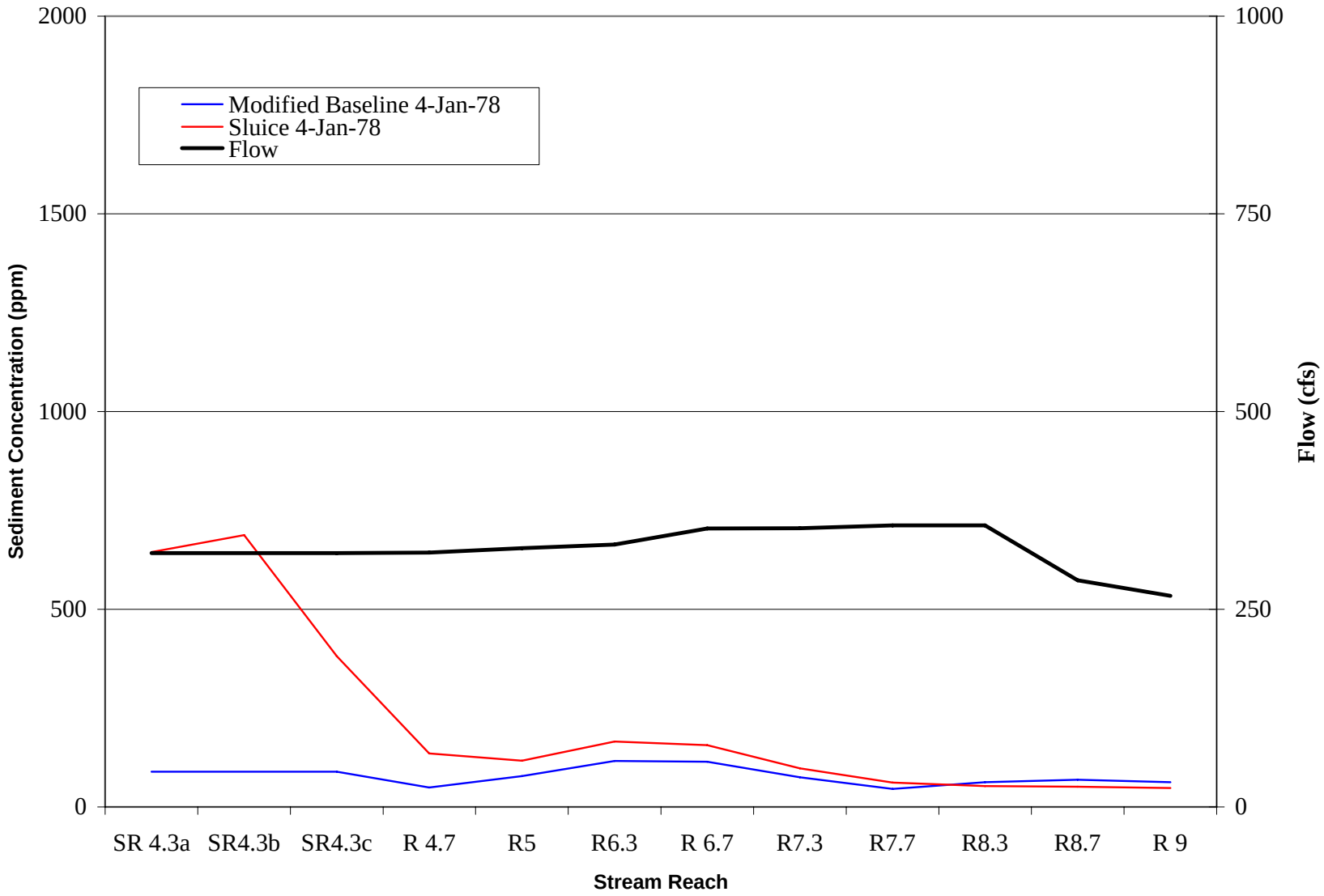


Figure O-12: Simulated Suspended Sediment Concentration along Carmel River for Day 2 of a Wet Year Sluice Event

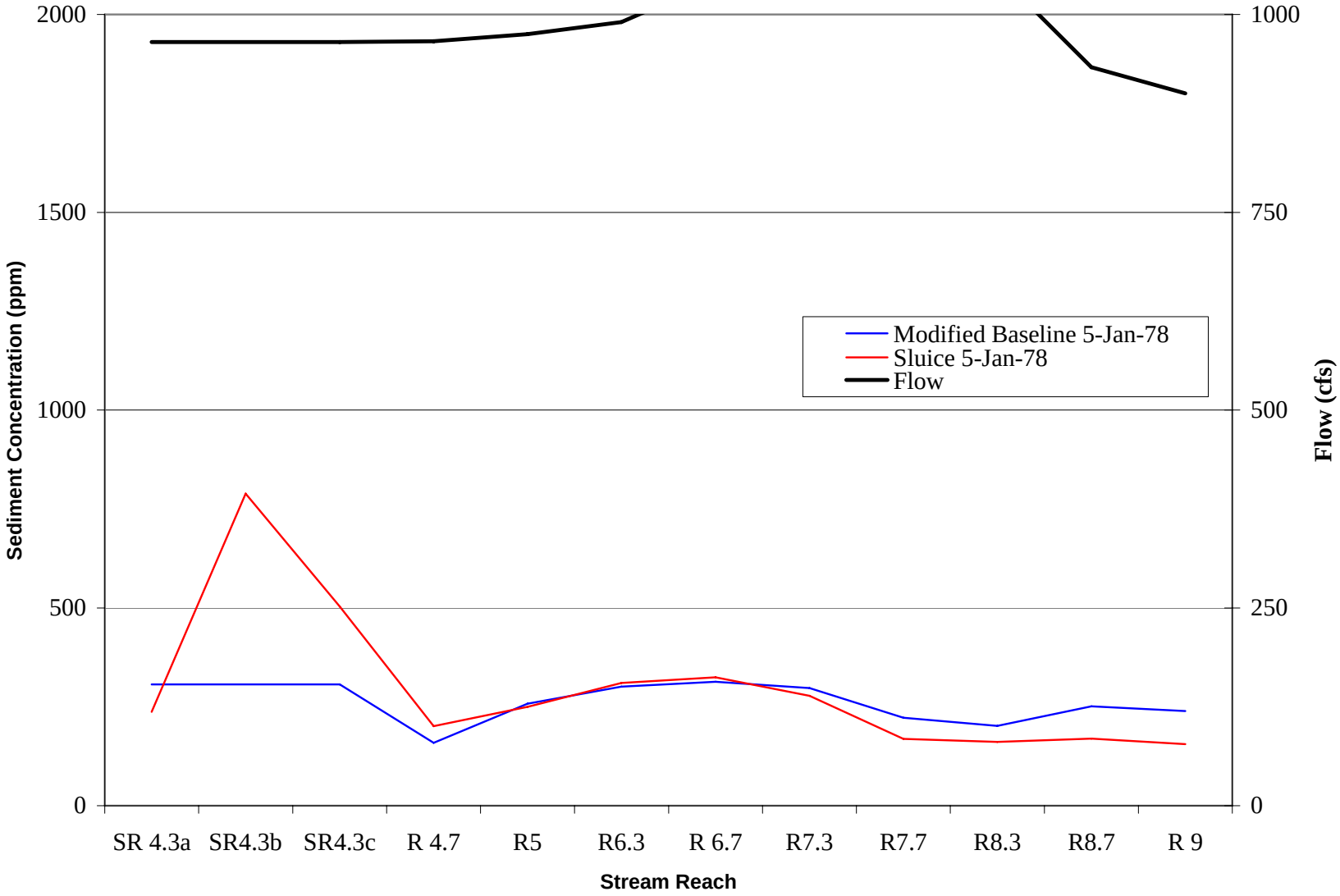


Figure O-13: Simulated Suspended Sediment Concentration along Carmel River for Day 3 of a Wet Year Sluice Event

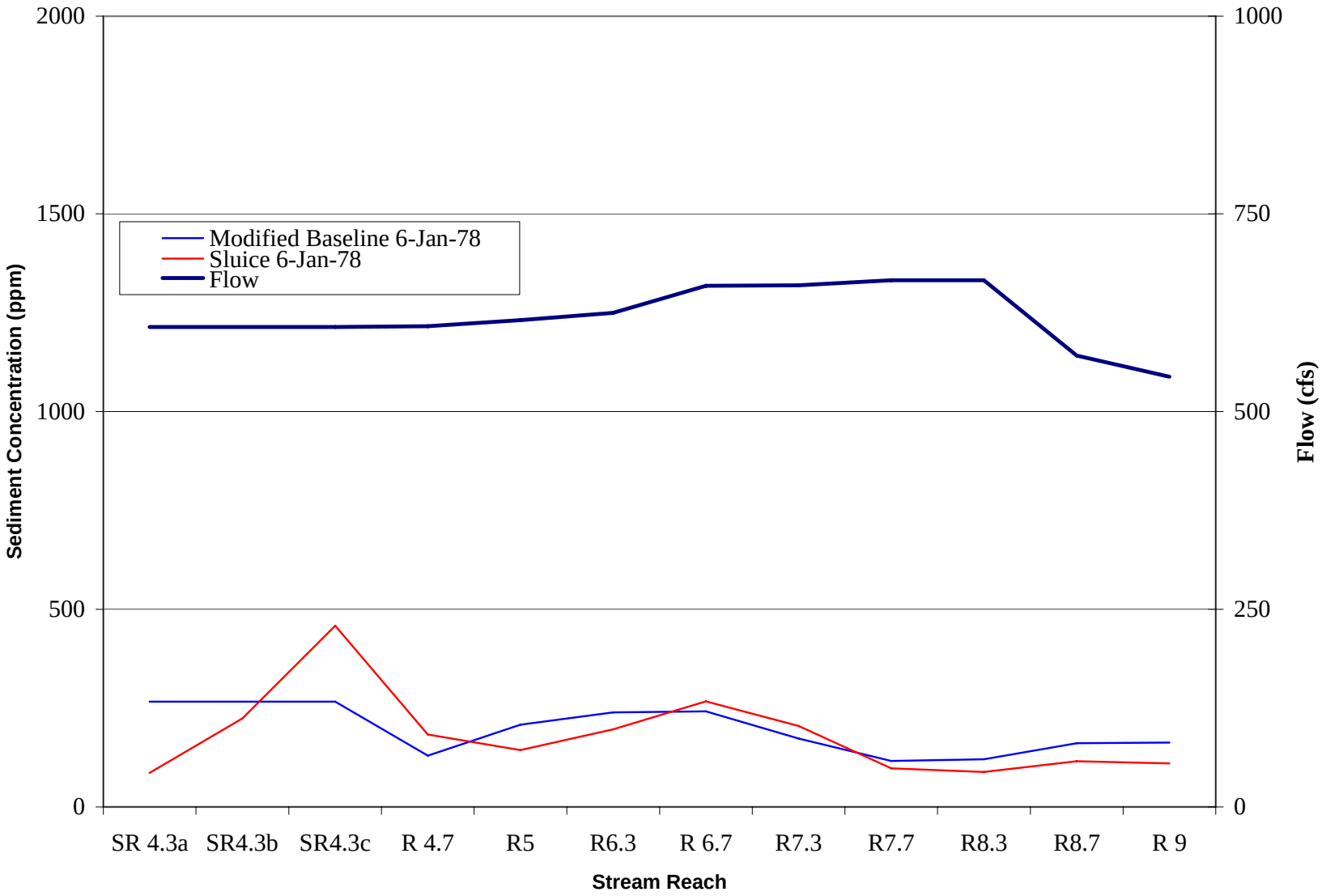


Figure O-14: Simulated Suspended Sediment Concentration along Carmel River for Day 4 of a Wet Year Sluice Event

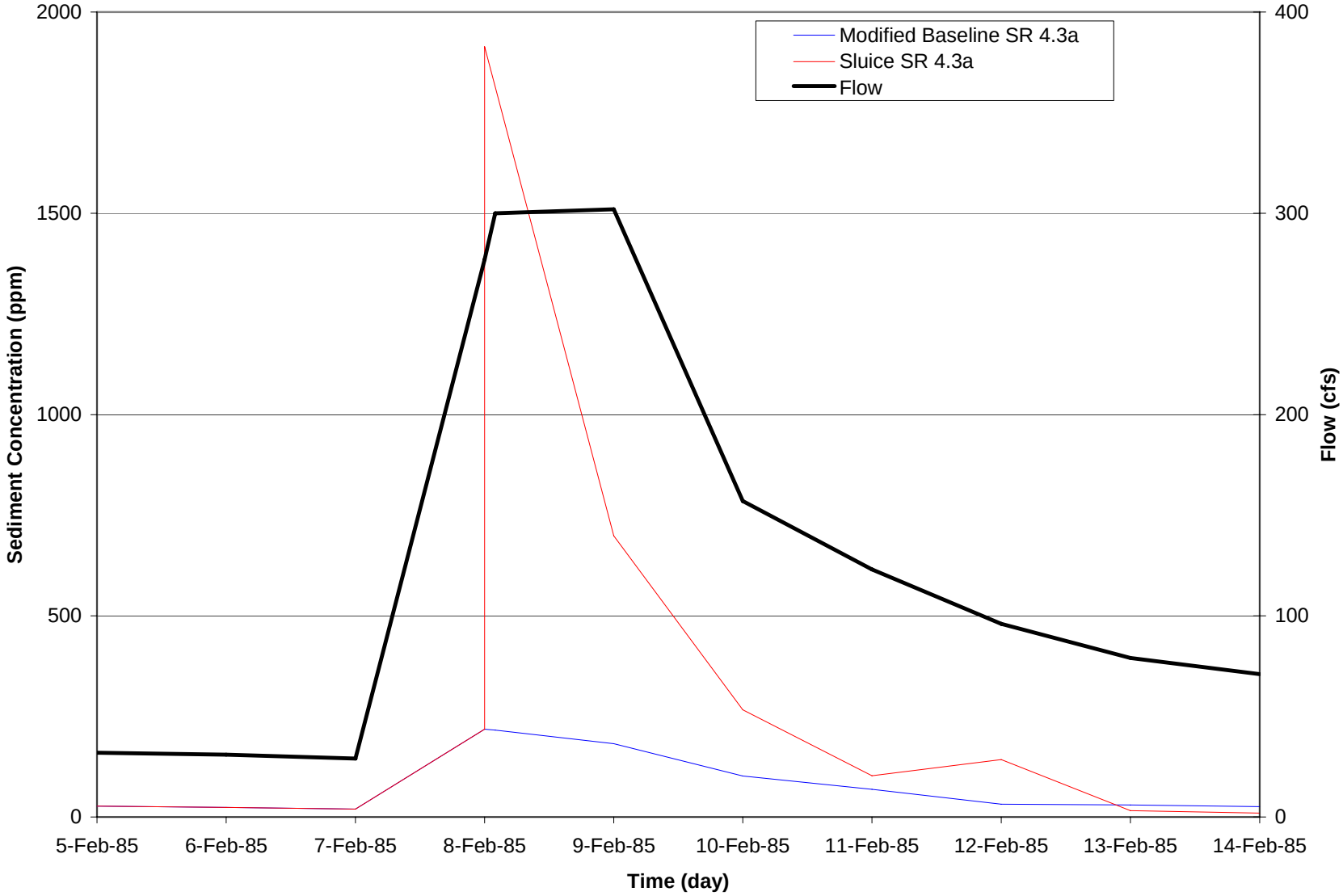


Figure O-15: Simulated Suspended Sediment Concentration at Reach 4.3 for a Dry Year

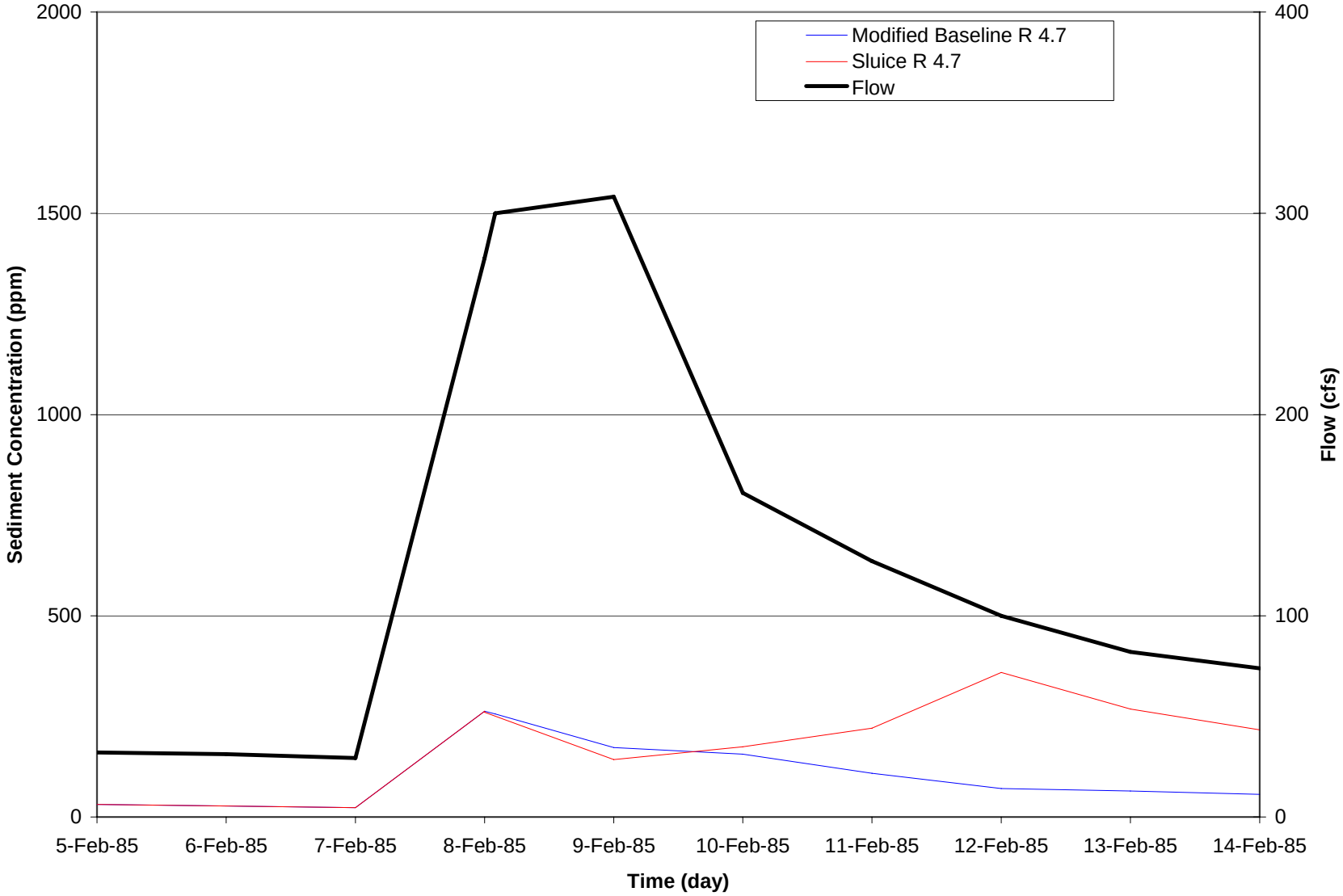


Figure O-16: Simulated Suspended Sediment Concentration at Reach 4.7 for a Dry Year

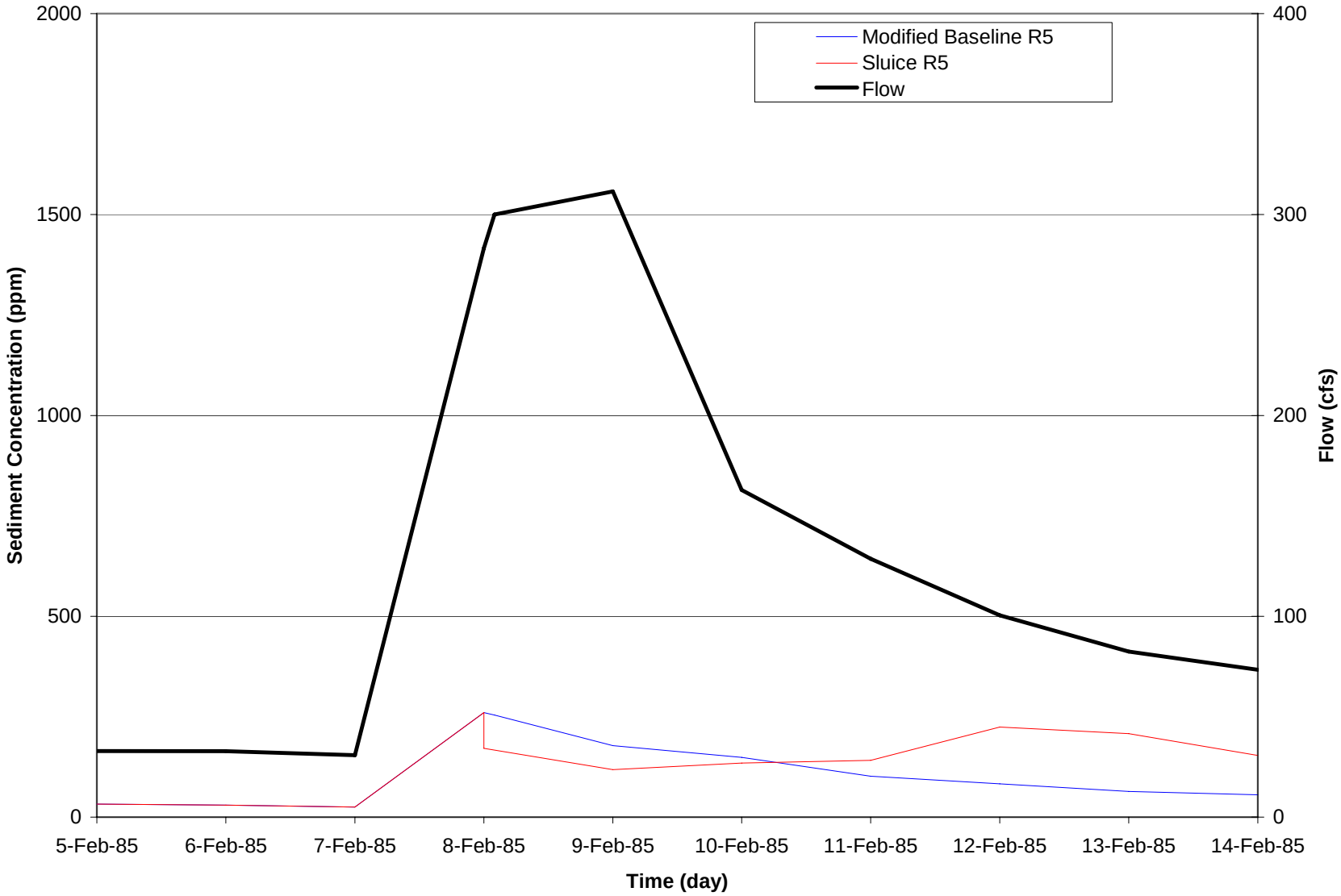


Figure O-17: Simulated Suspended Sediment Concentration at Reach 5 for a Dry Year

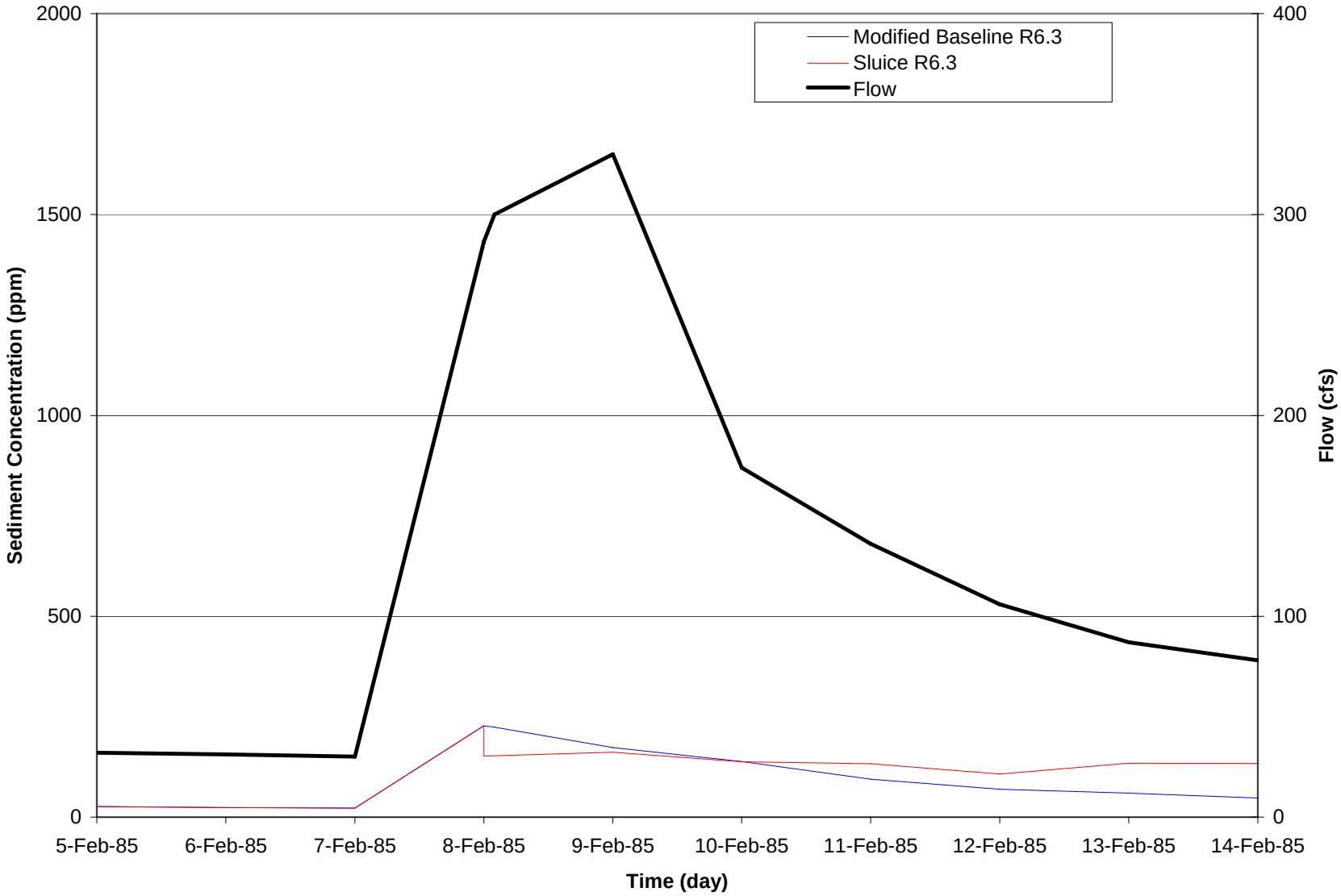


Figure O-18: Simulated Suspended Sediment Concentration at Reach 6.3 for a Dry Year

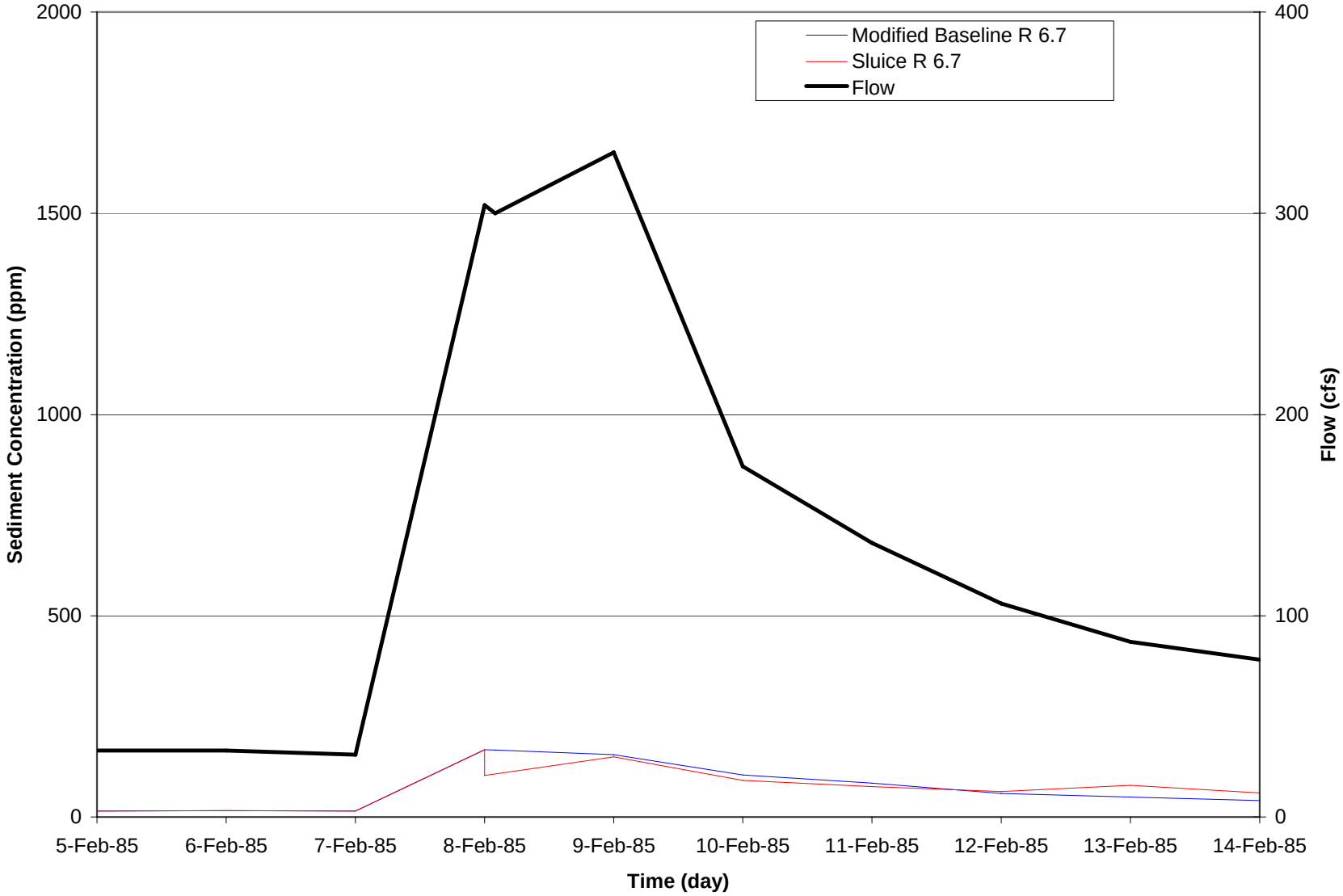


Figure O-19: Simulated Suspended Sediment Concentration at Reach 6.7 for a Dry Year

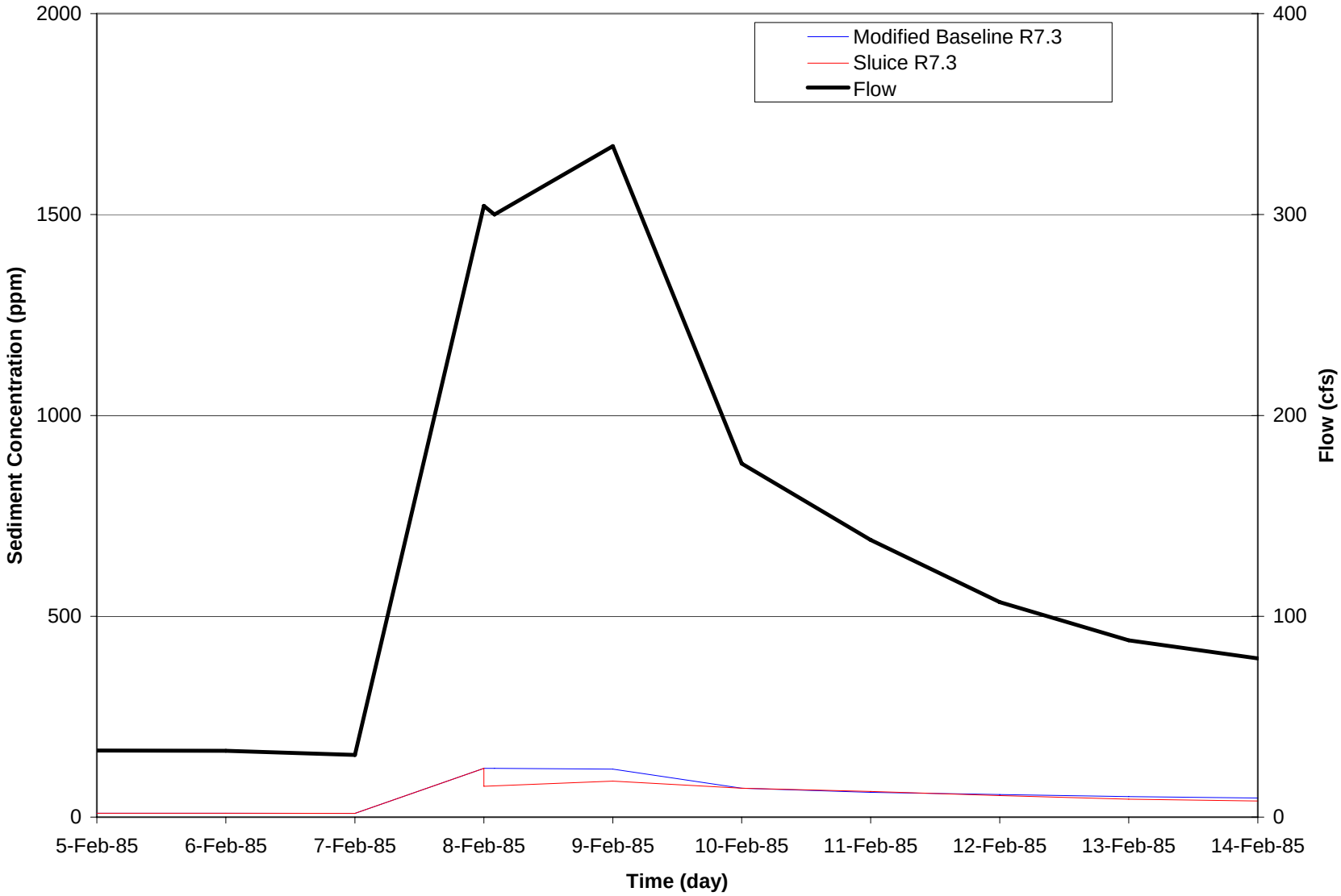


Figure O-20: Simulated Suspended Sediment Concentration at Reach 7.3 for a Dry Year

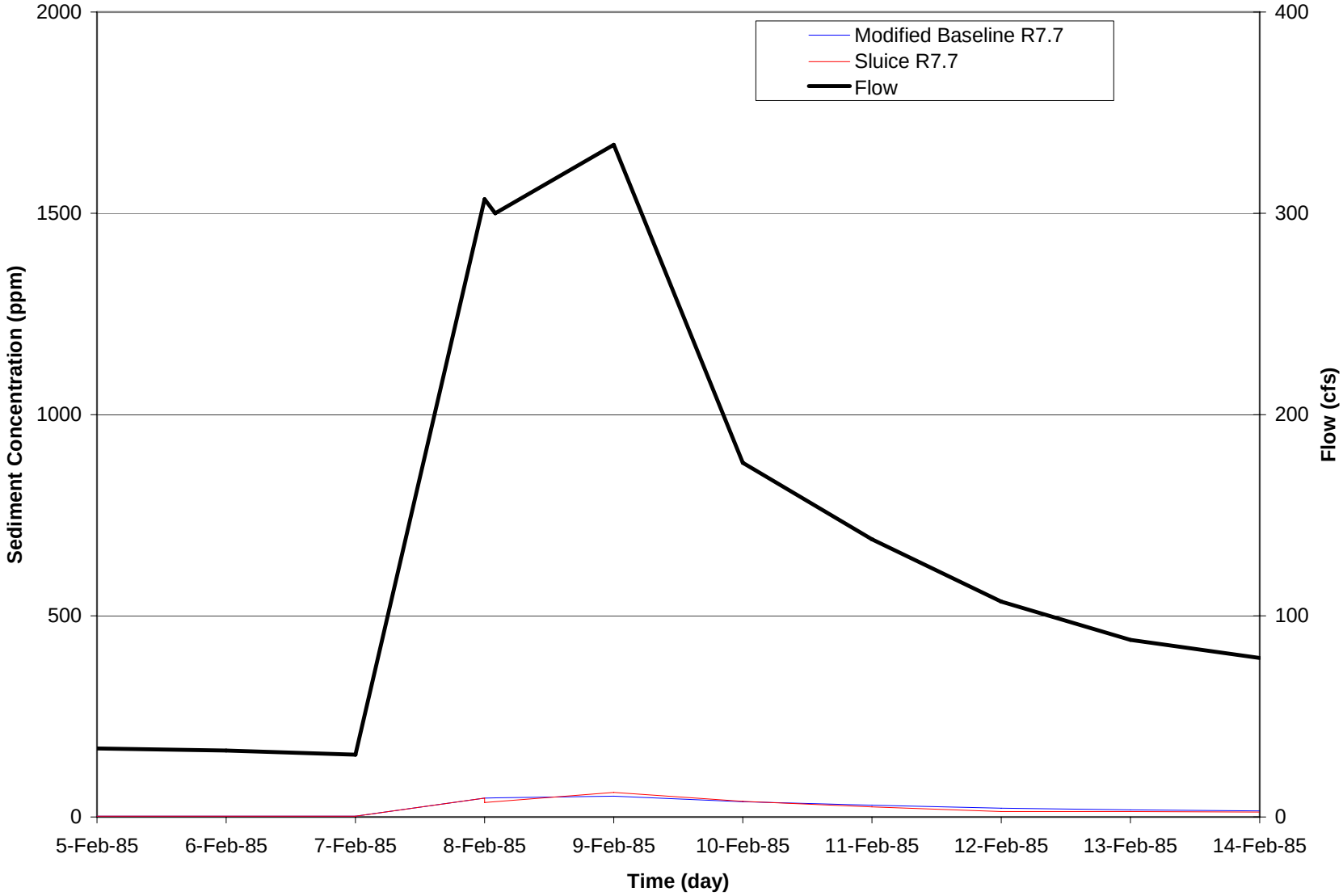


Figure O-21: Simulated Suspended Sediment Concentration at Reach 7.7 for a Dry Year

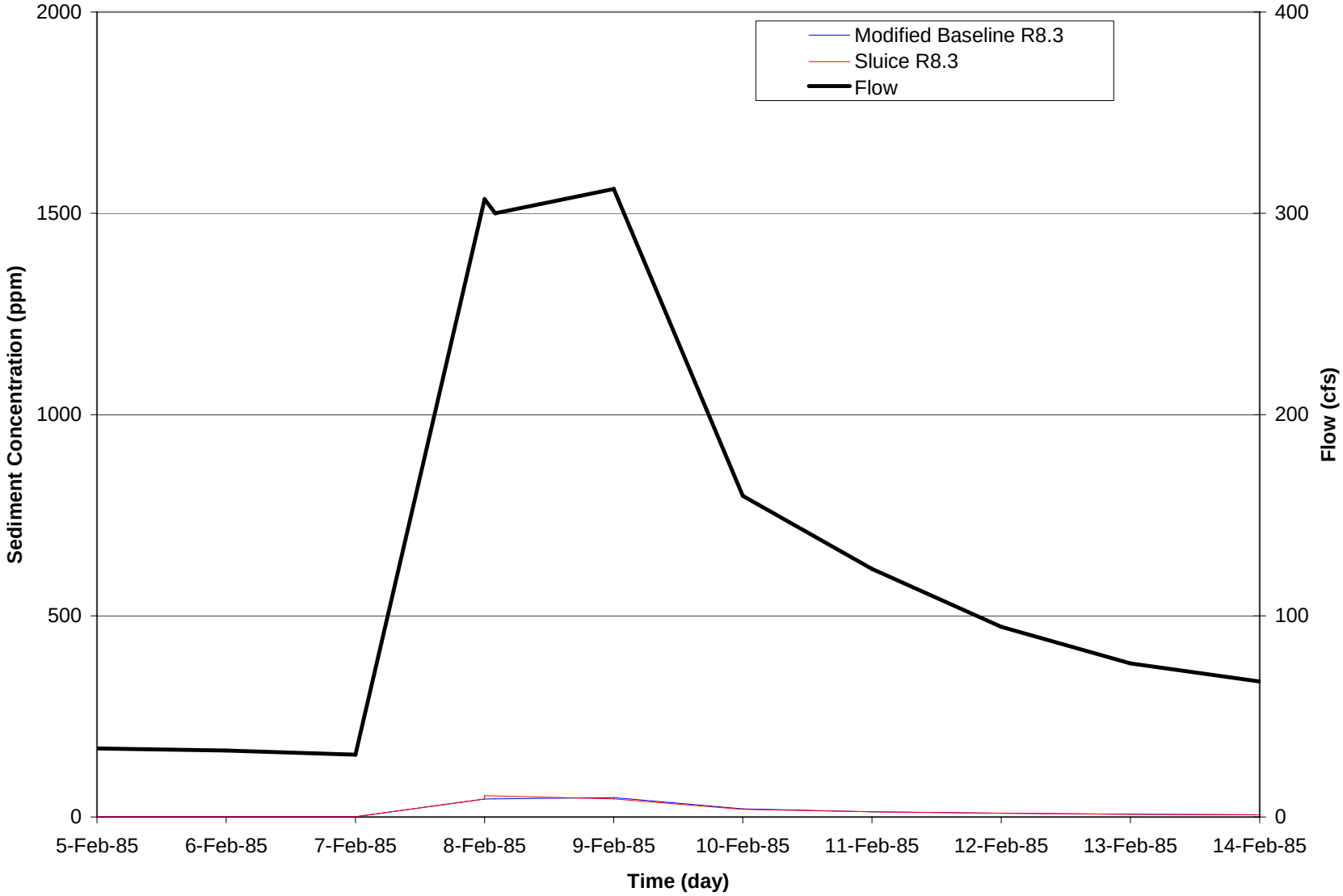


Figure O-22: Simulated Suspended Sediment Concentration at Reach 8.3 for a Dry Year

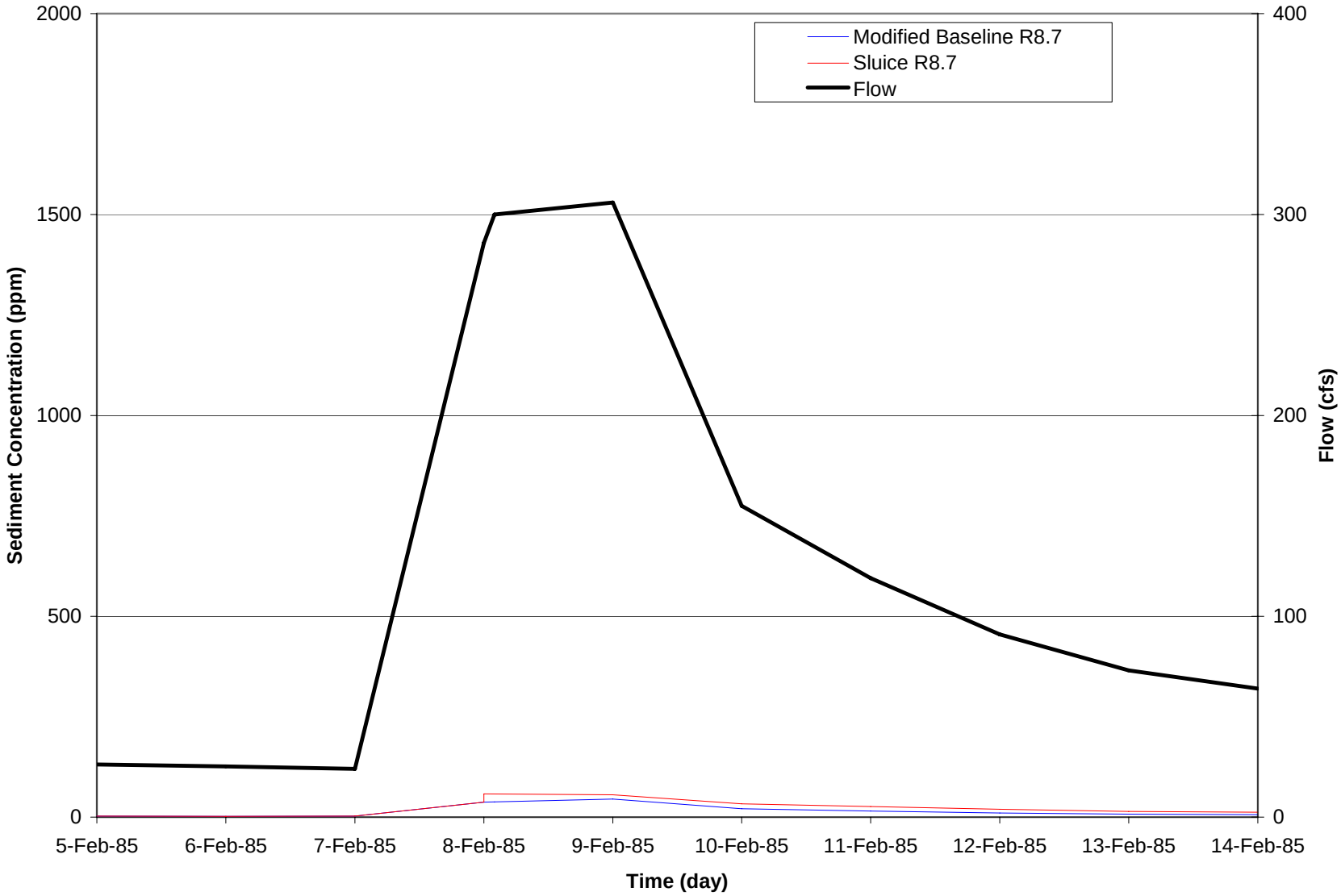


Figure O-23: Simulated Suspended Sediment Concentration at Reach 8.7 for a Dry Year

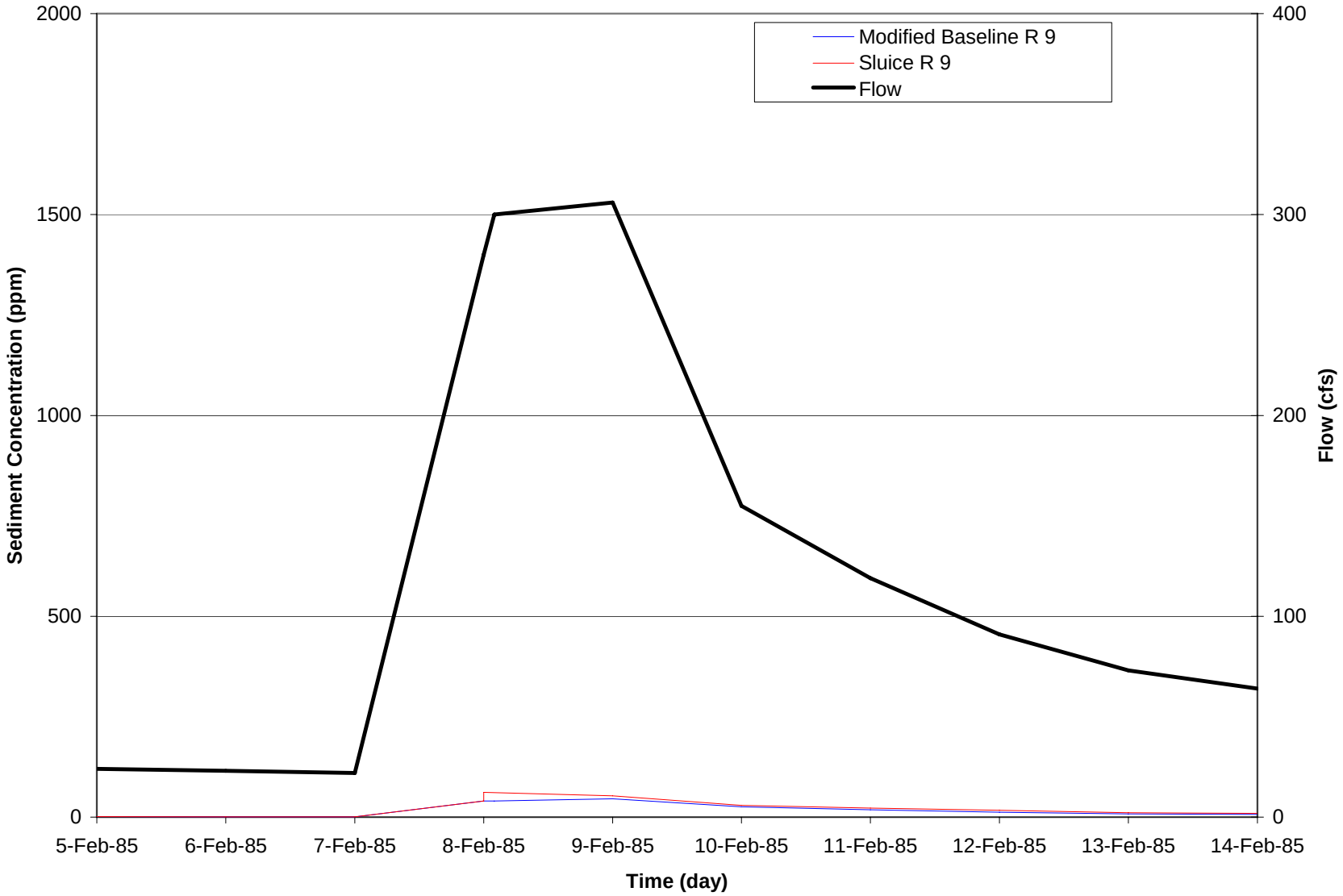


Figure O-24: Simulated Suspended Sediment Concentration at Reach 9 for a Dry Year

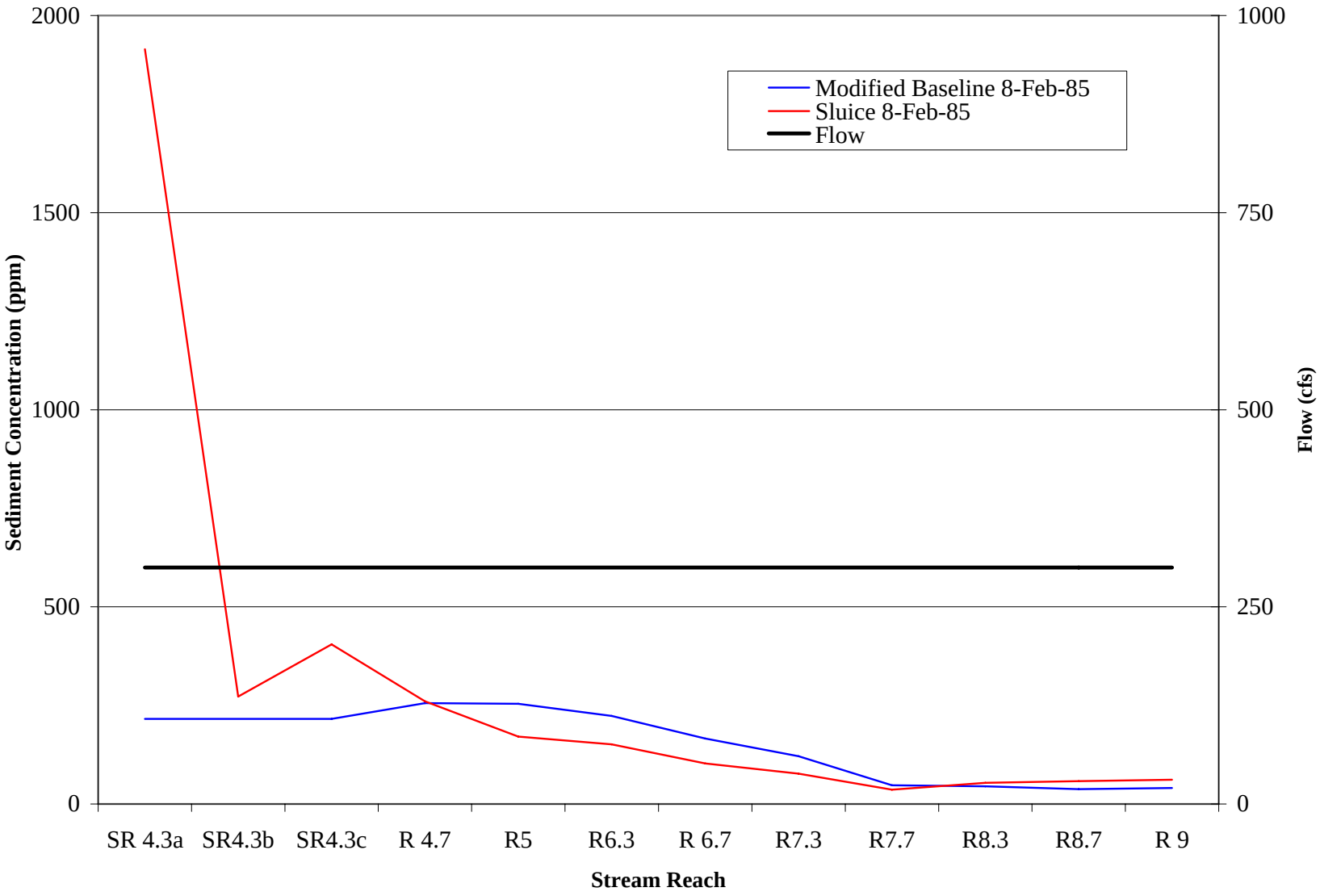


Figure O-25: Simulated Suspended Sediment Concentration along Carmel River for Day 1 of a Dry Year Sluice Event

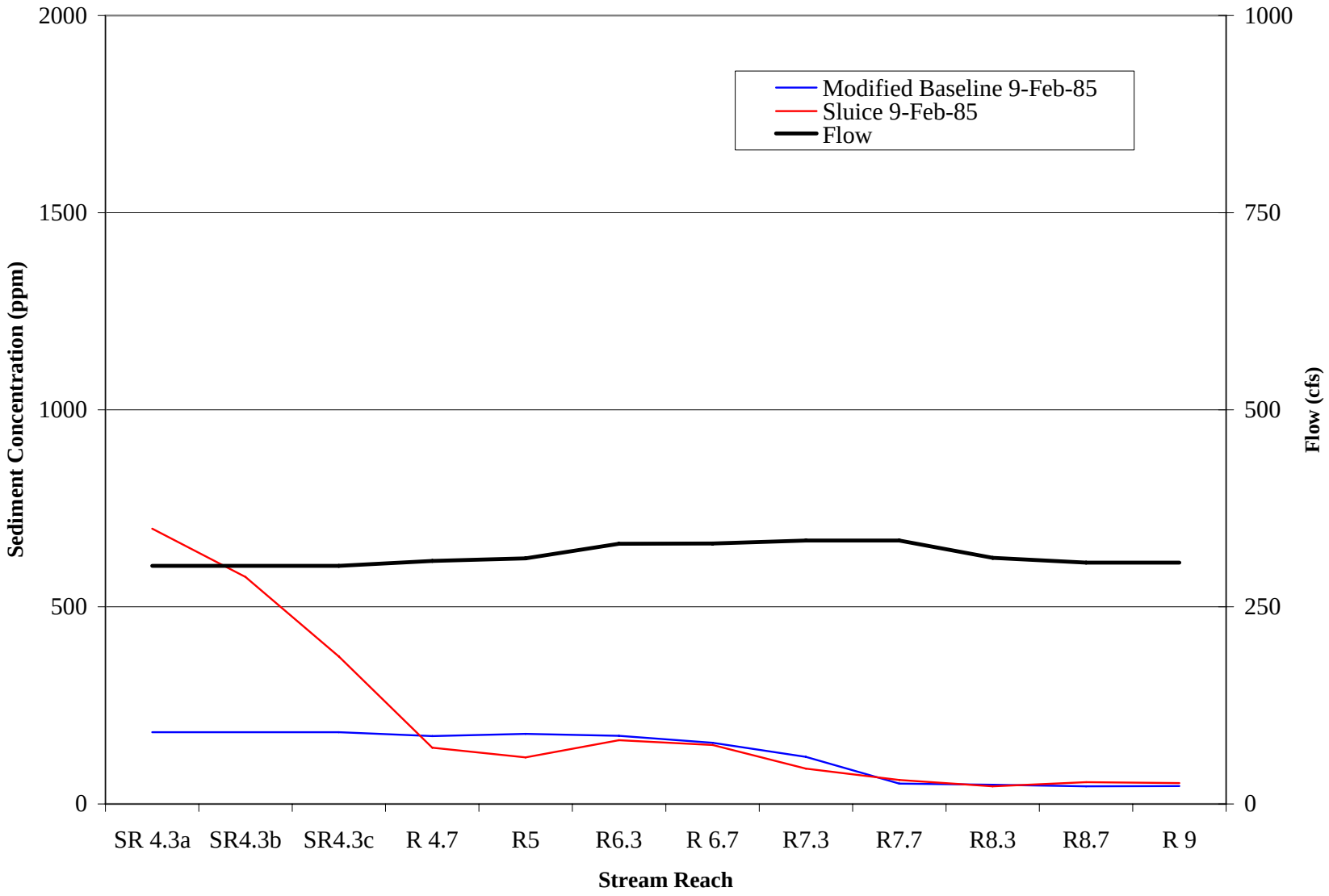


Figure O-26: Simulated Suspended Sediment Concentration along Carmel River for Day 2 of a Dry Year Sluice Event

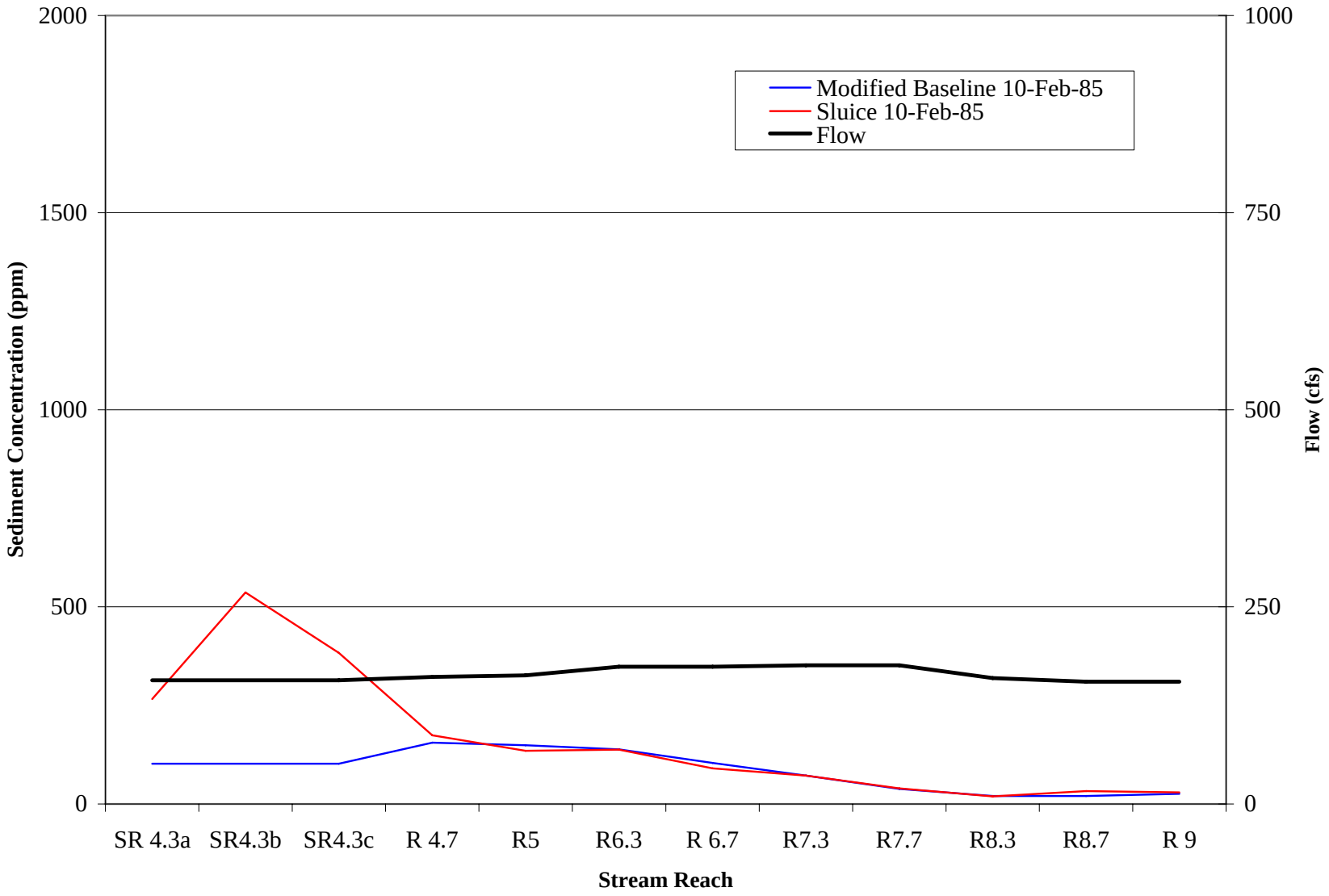


Figure O-27: Simulated Suspended Sediment Concentration along Carmel River for Day 3 of a Dry Year Sluice Event

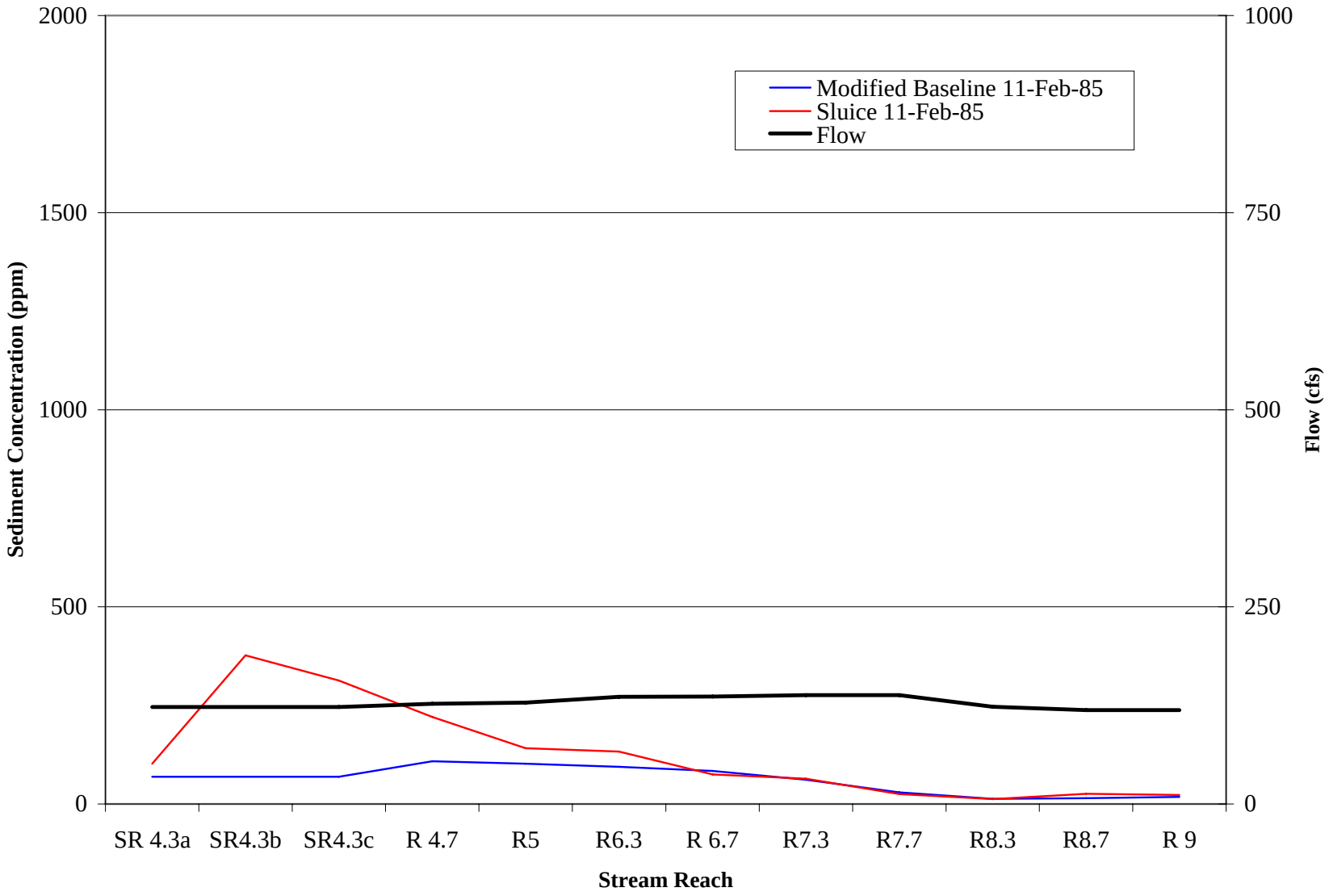


Figure O-28: Simulated Suspended Sediment Concentration along Carmel River for Day 4 of a Dry Year Sluice Event

Appendix P

SUSPENDED SEDIMENT CONCENTRATION EXCEEDANCE FOR THE ALTERNATIVES

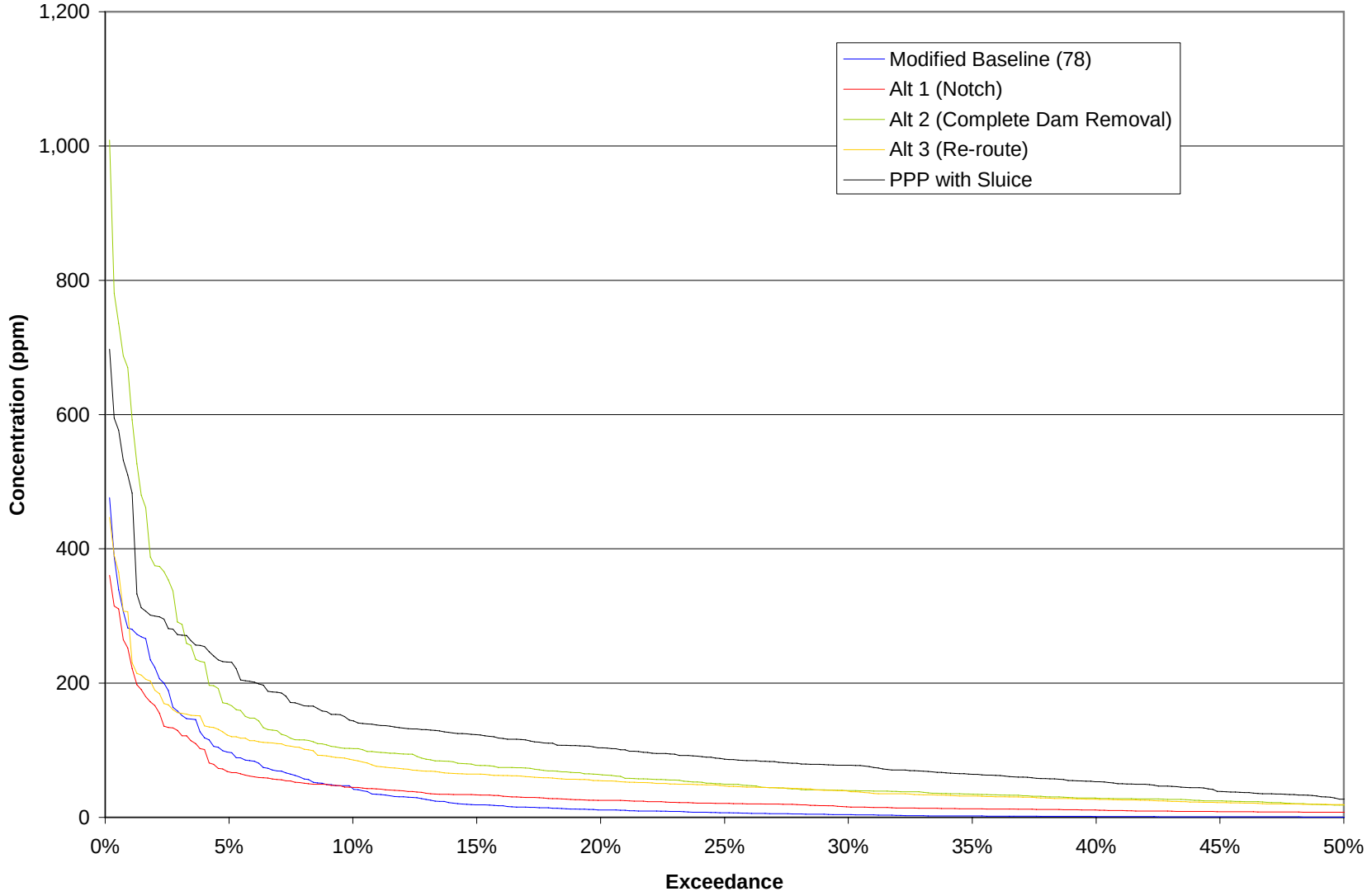


Figure P-1: Simulated Suspended Sediment Concentration Exceedance at Reach 4.3 for a Wet Year

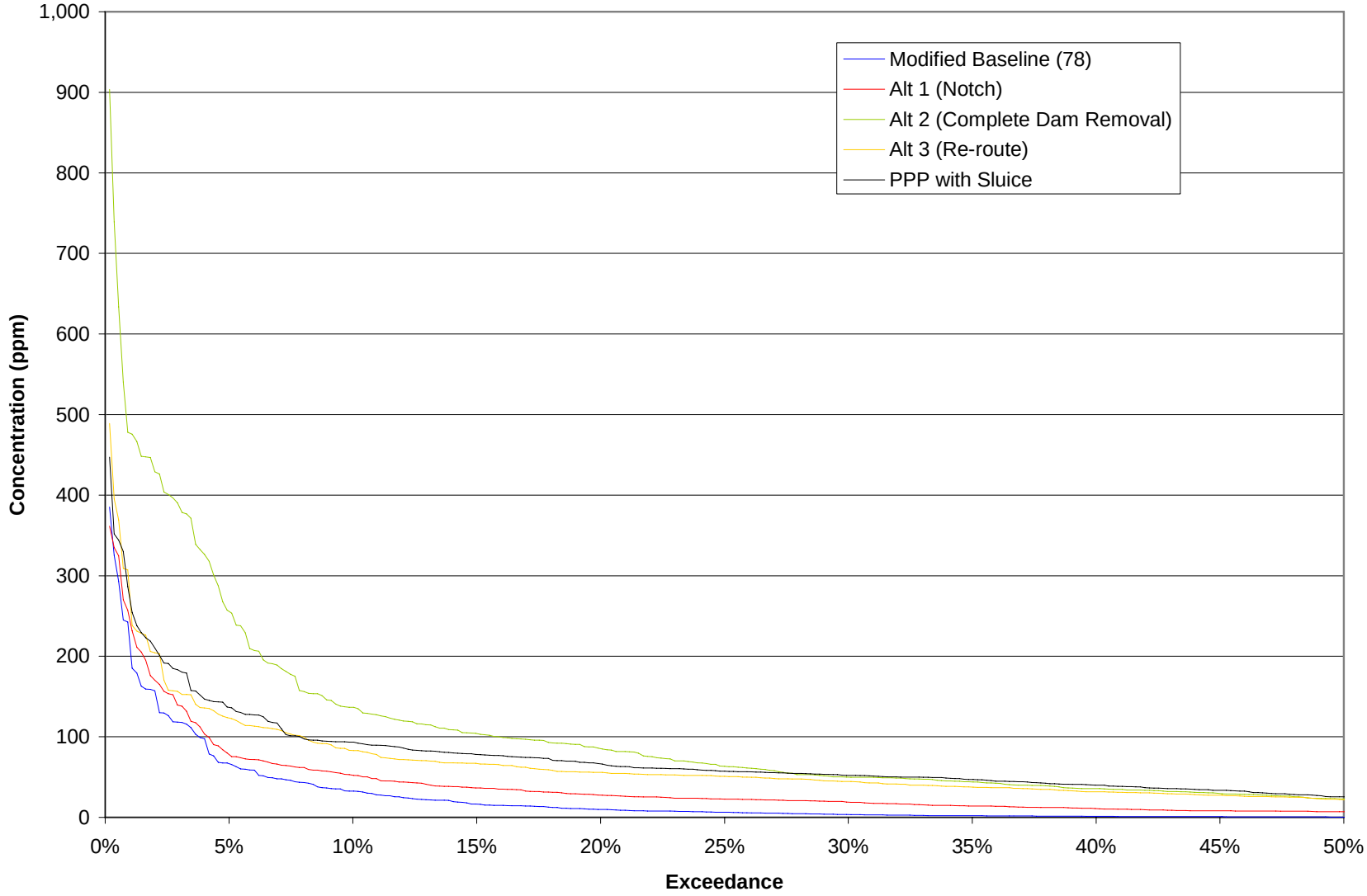


Figure P-2: Simulated Suspended Sediment Concentration Exceedance at Reach 4.7 for a Wet Year

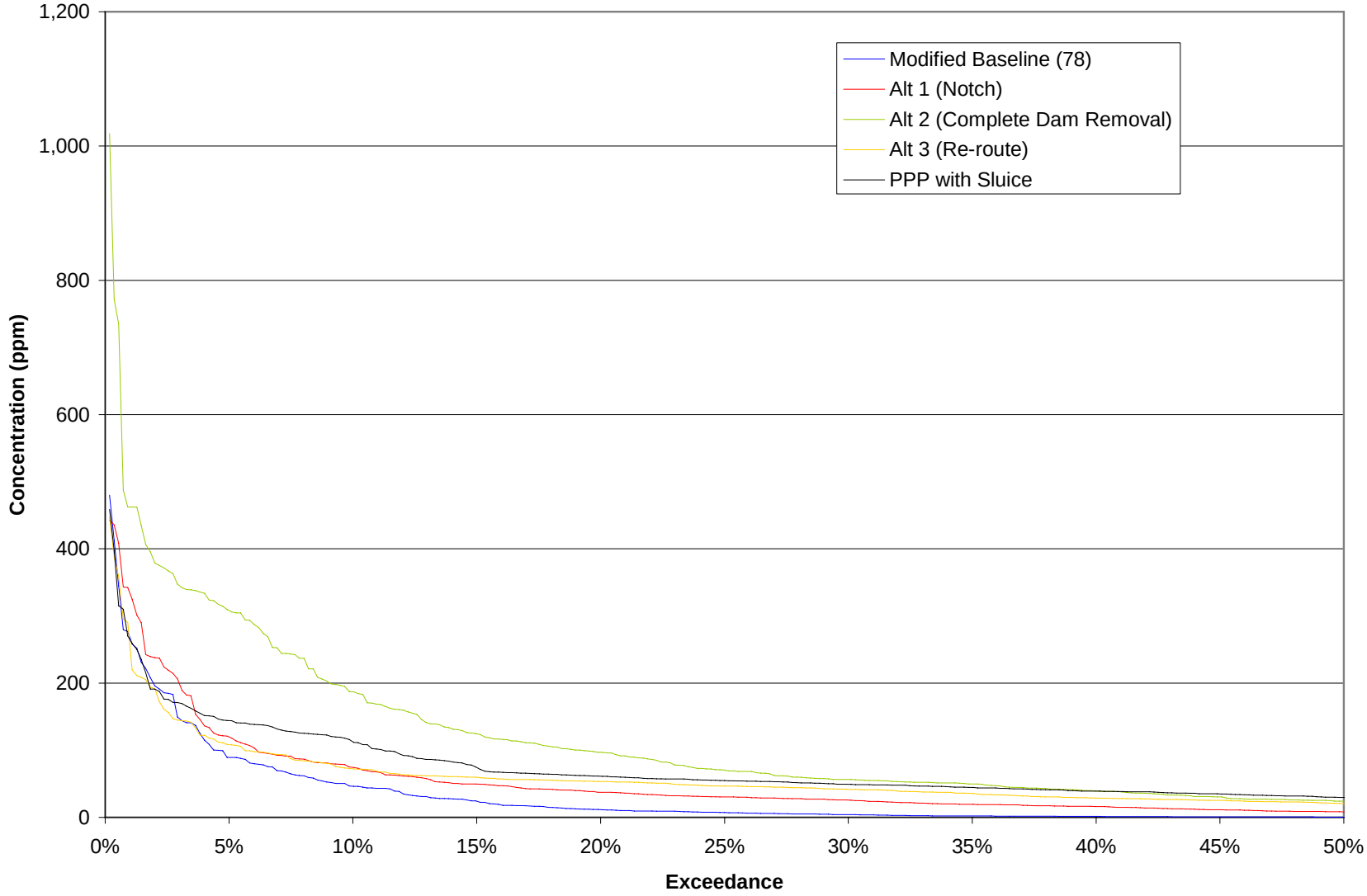


Figure P-3: Simulated Suspended Sediment Concentration Exceedance at Reach 5 for a Wet Year

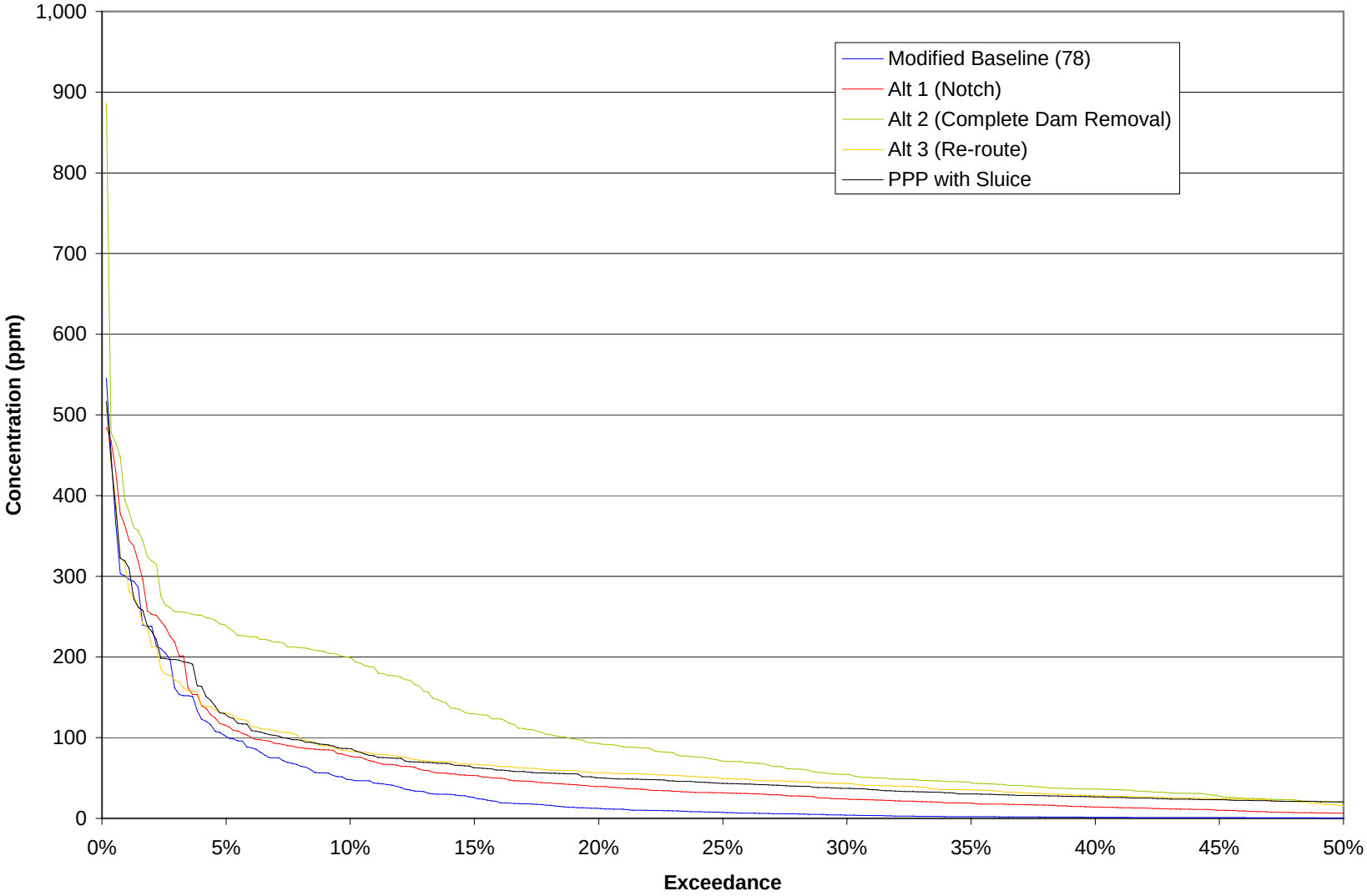


Figure P-4: Simulated Suspended Sediment Concentration Exceedance at Reach 6.3 for a Wet Year

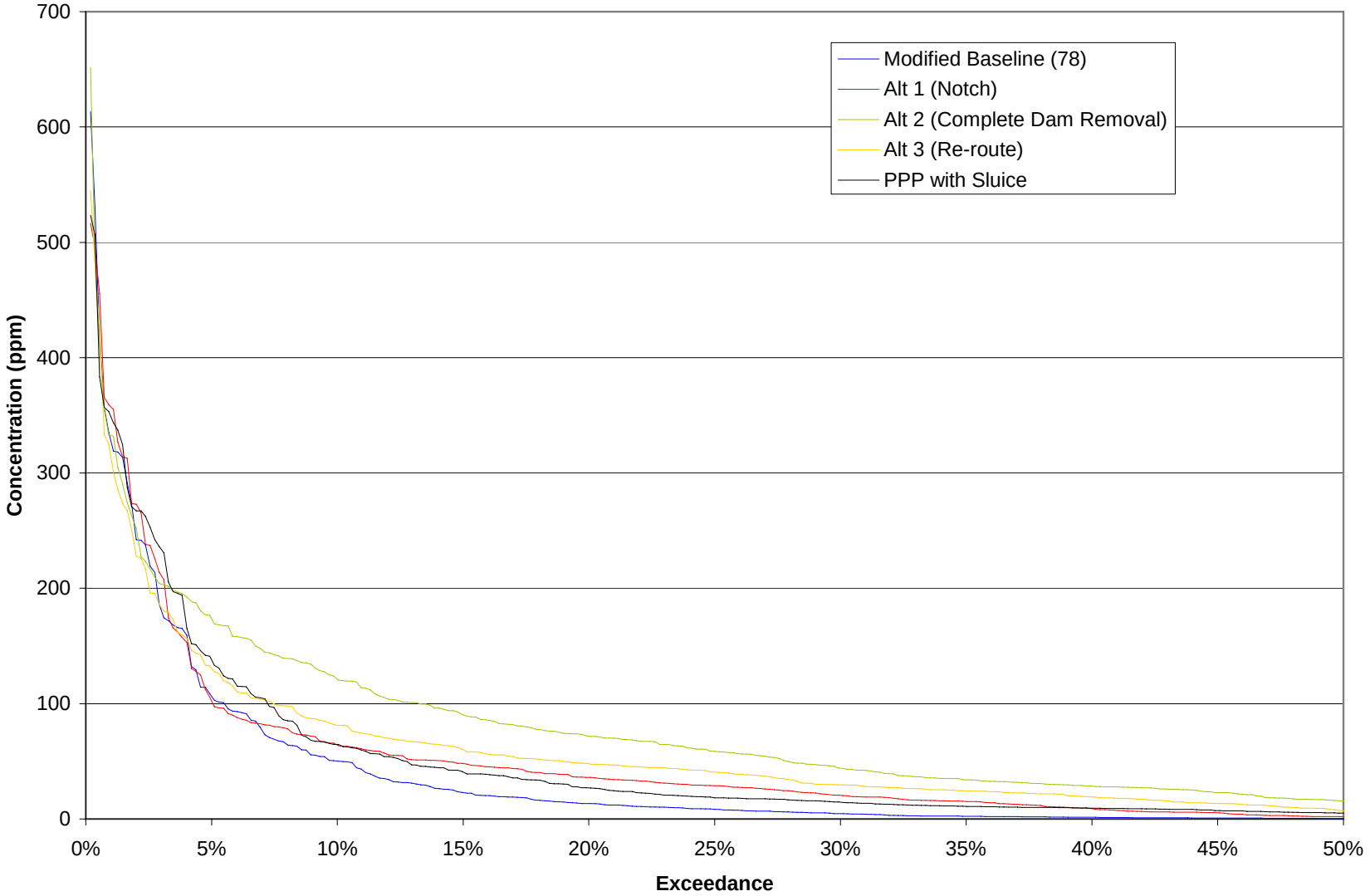


Figure P-5: Simulated Suspended Sediment Concentration Exceedance at Reach 6.7 for a Wet Year

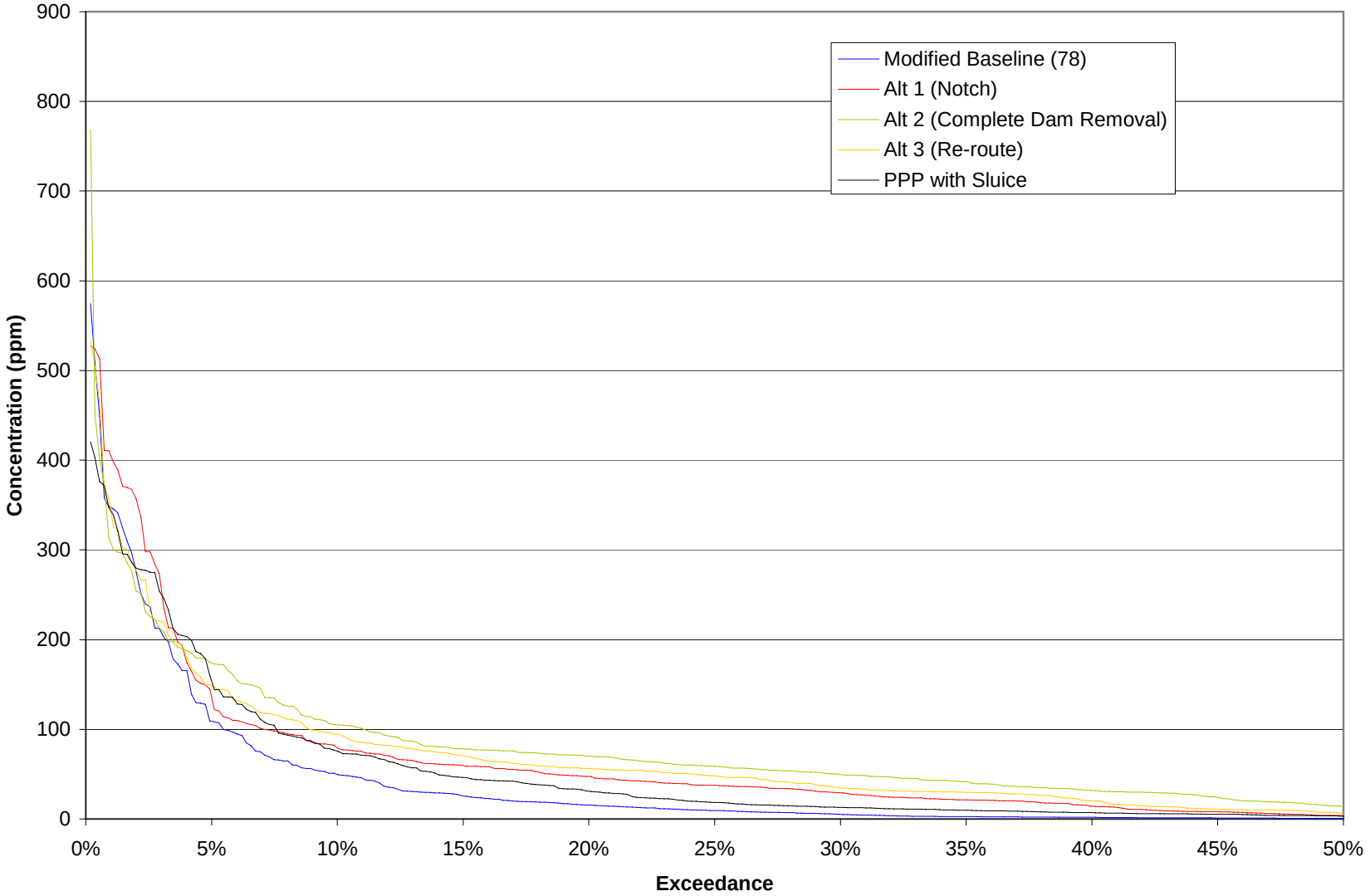


Figure P-6: Simulated Suspended Sediment Concentration Exceedance at Reach 7.3 for a Wet Year

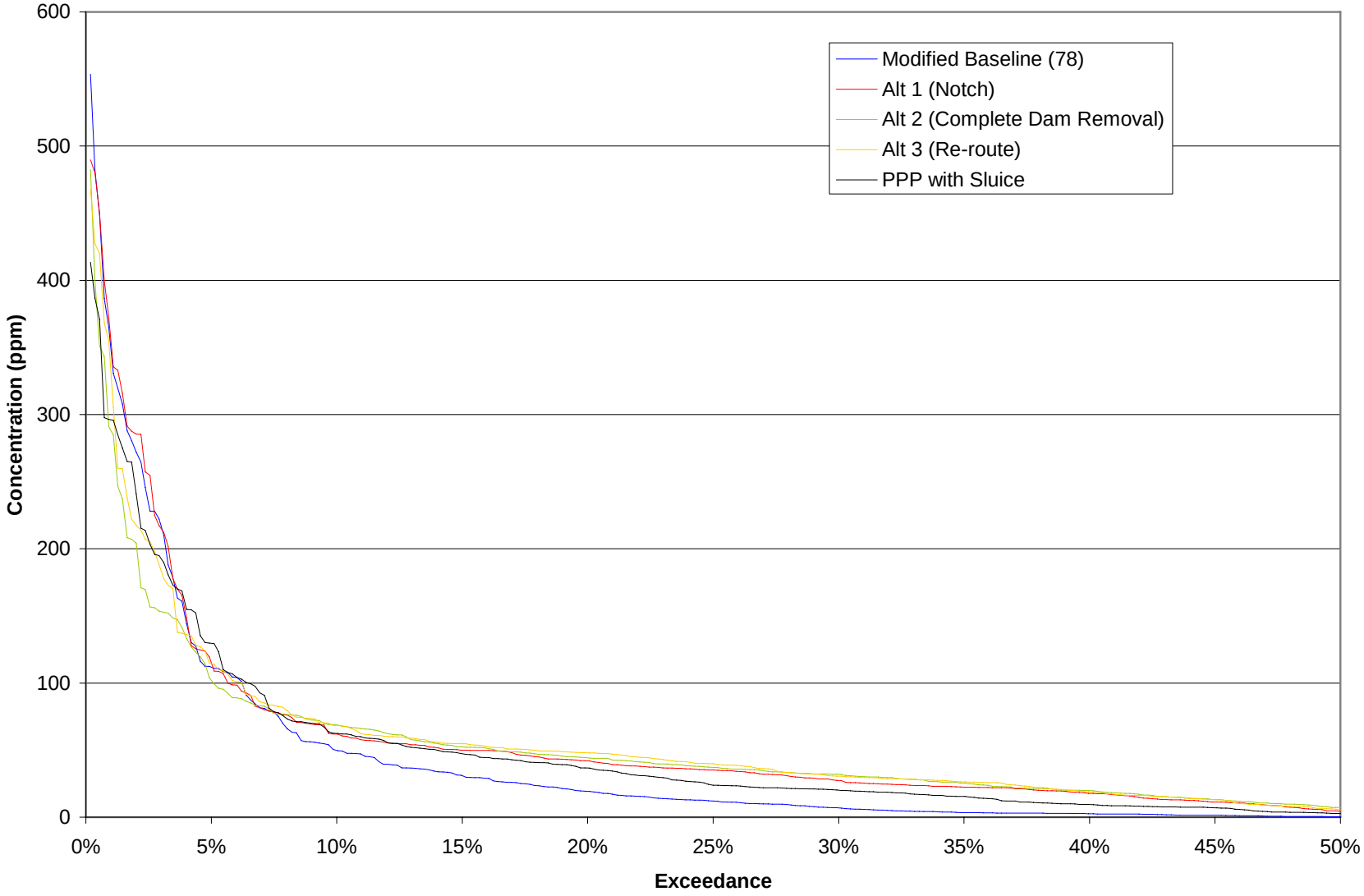


Figure P-7: Simulated Suspended Sediment Concentration Exceedance at Reach 7.7 for a Wet Year

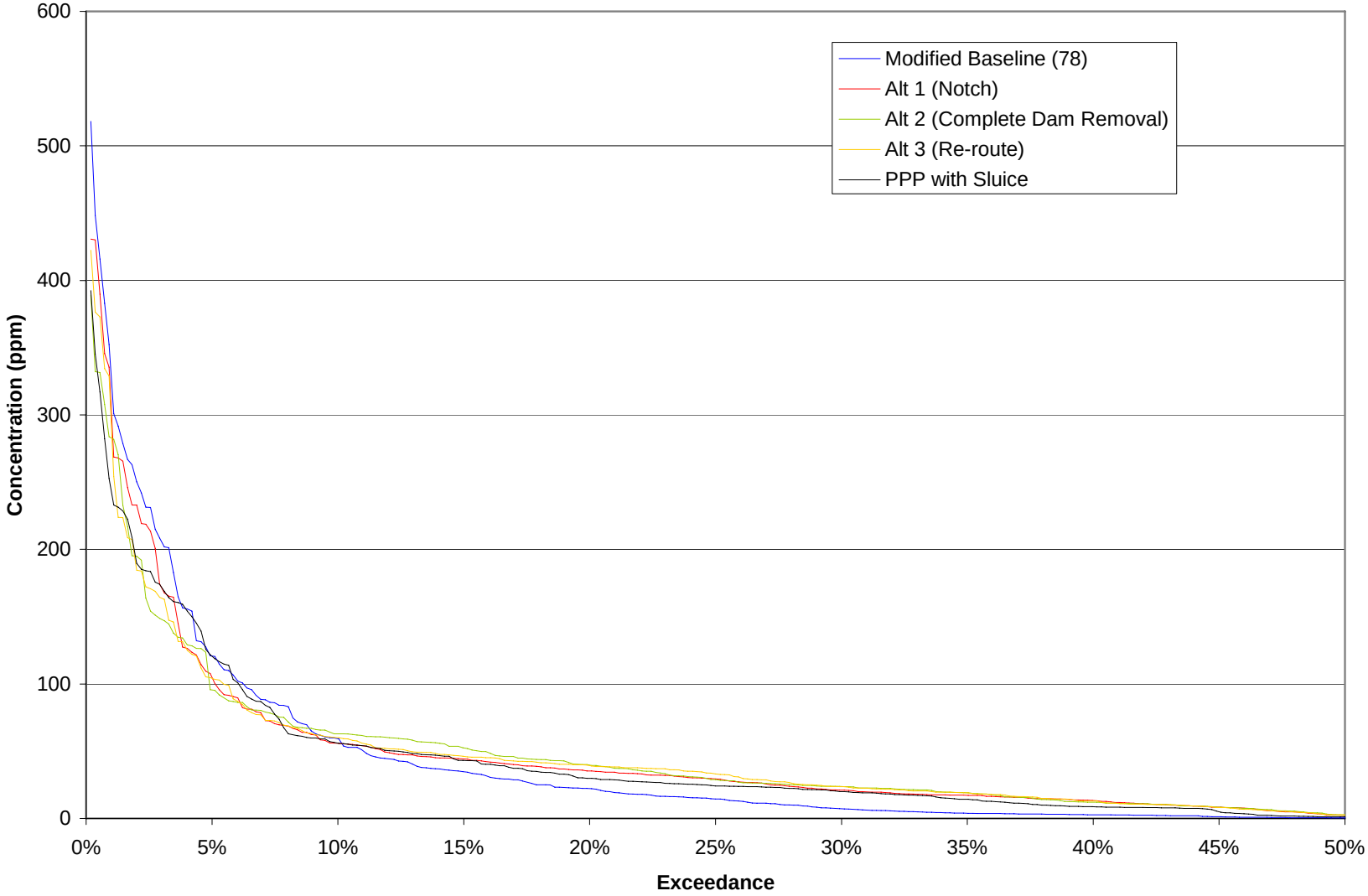


Figure P-8: Simulated Suspended Sediment Concentration Exceedance at Reach 8.3 for a Wet Year

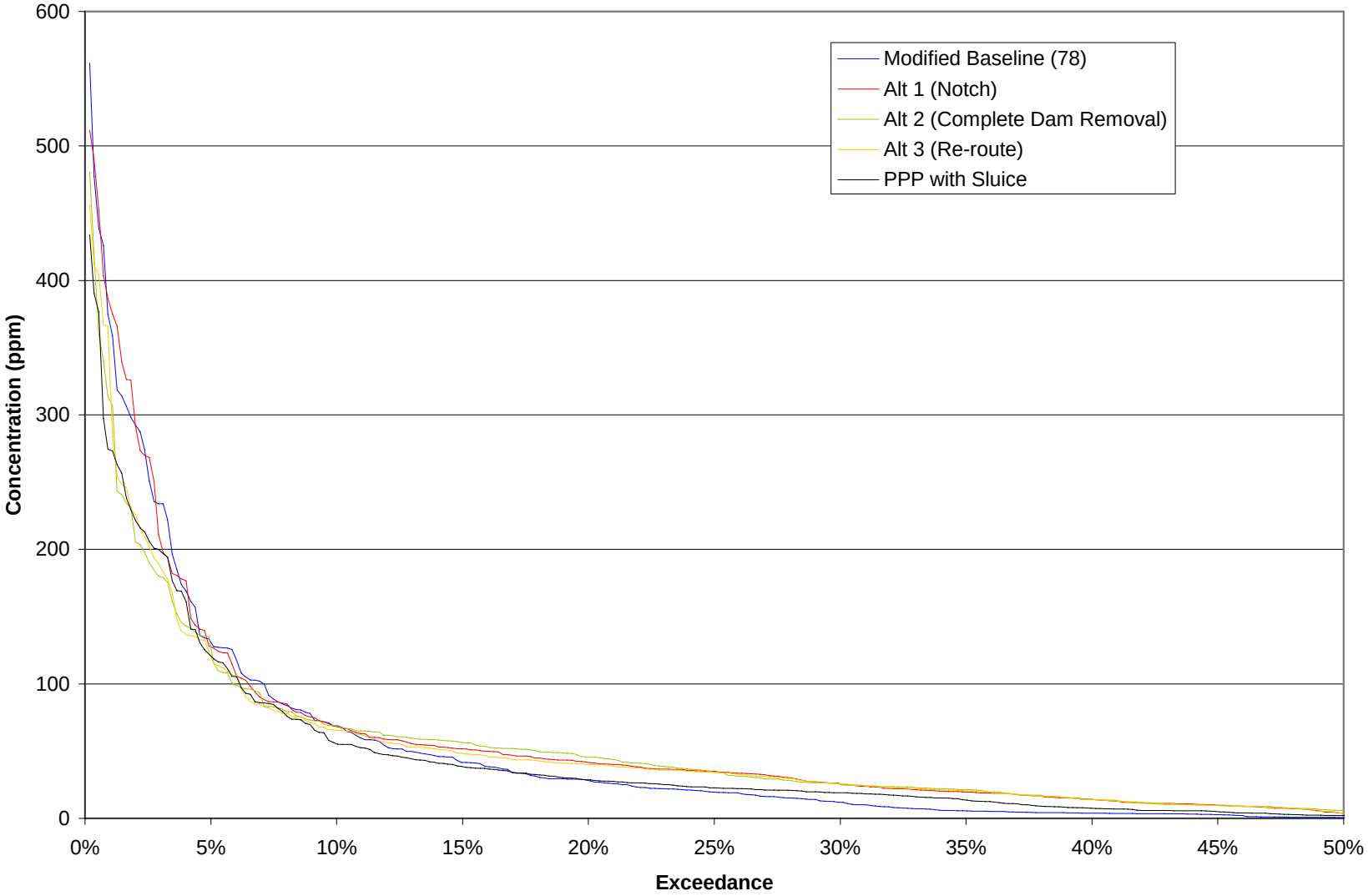


Figure P-9: Simulated Suspended Sediment Concentration Exceedance at Reach 8.7 for a Wet Year

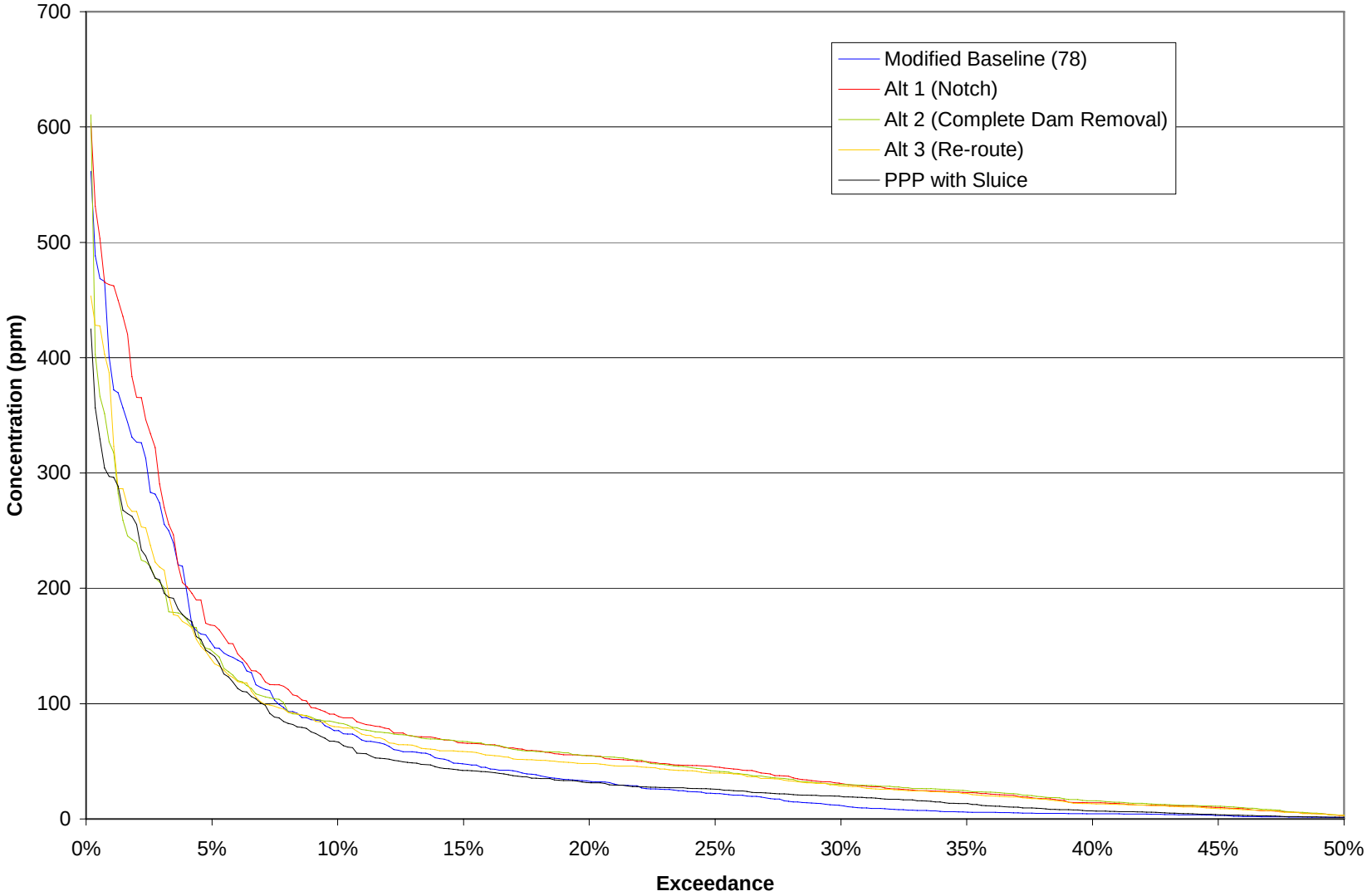


Figure P-10: Simulated Suspended Sediment Concentration Exceedance at Reach 9 for a Wet Year

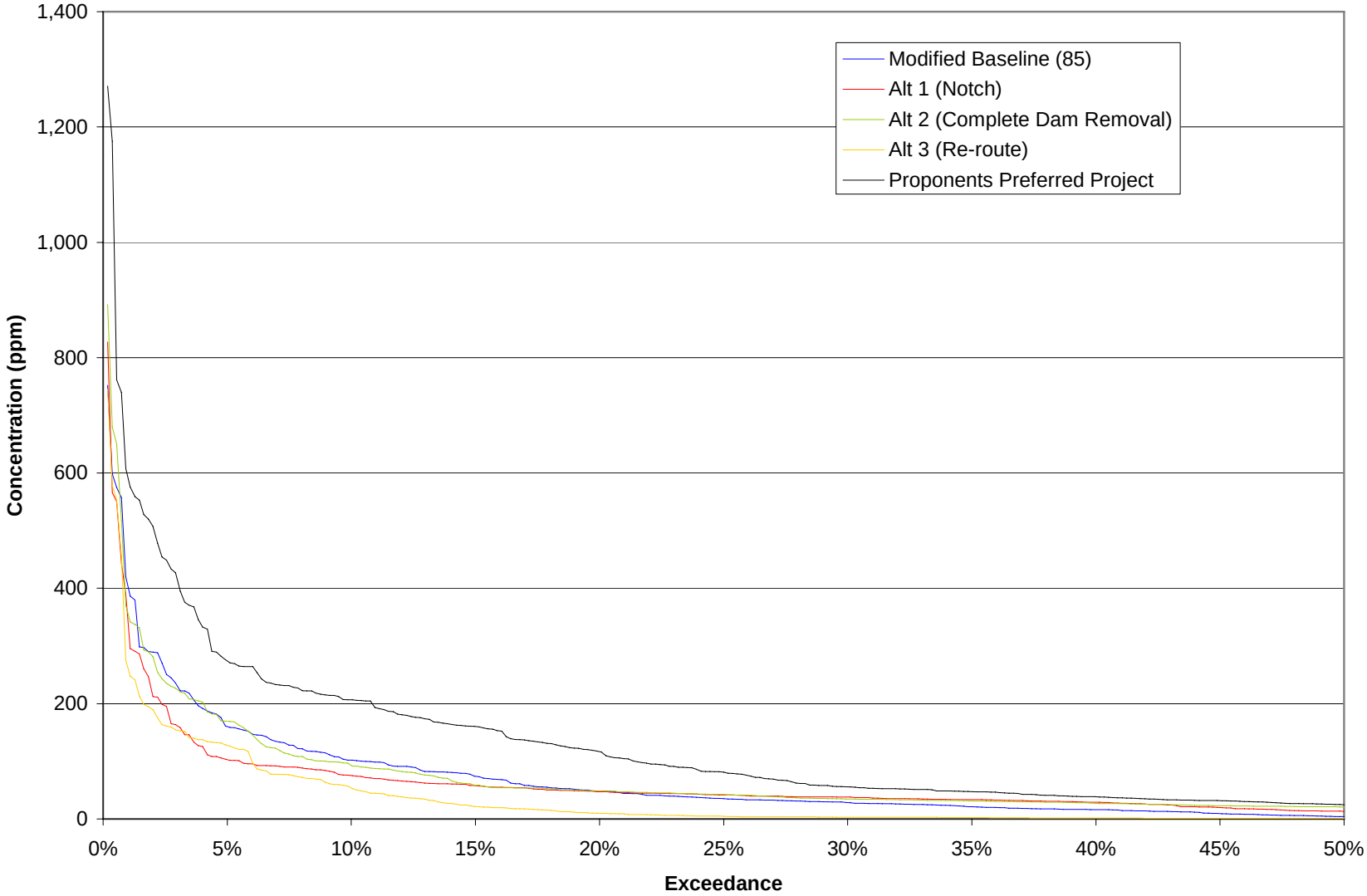


Figure P-11: Simulated Suspended Sediment Concentration Exceedance at Reach 4.3 for a Dry Year

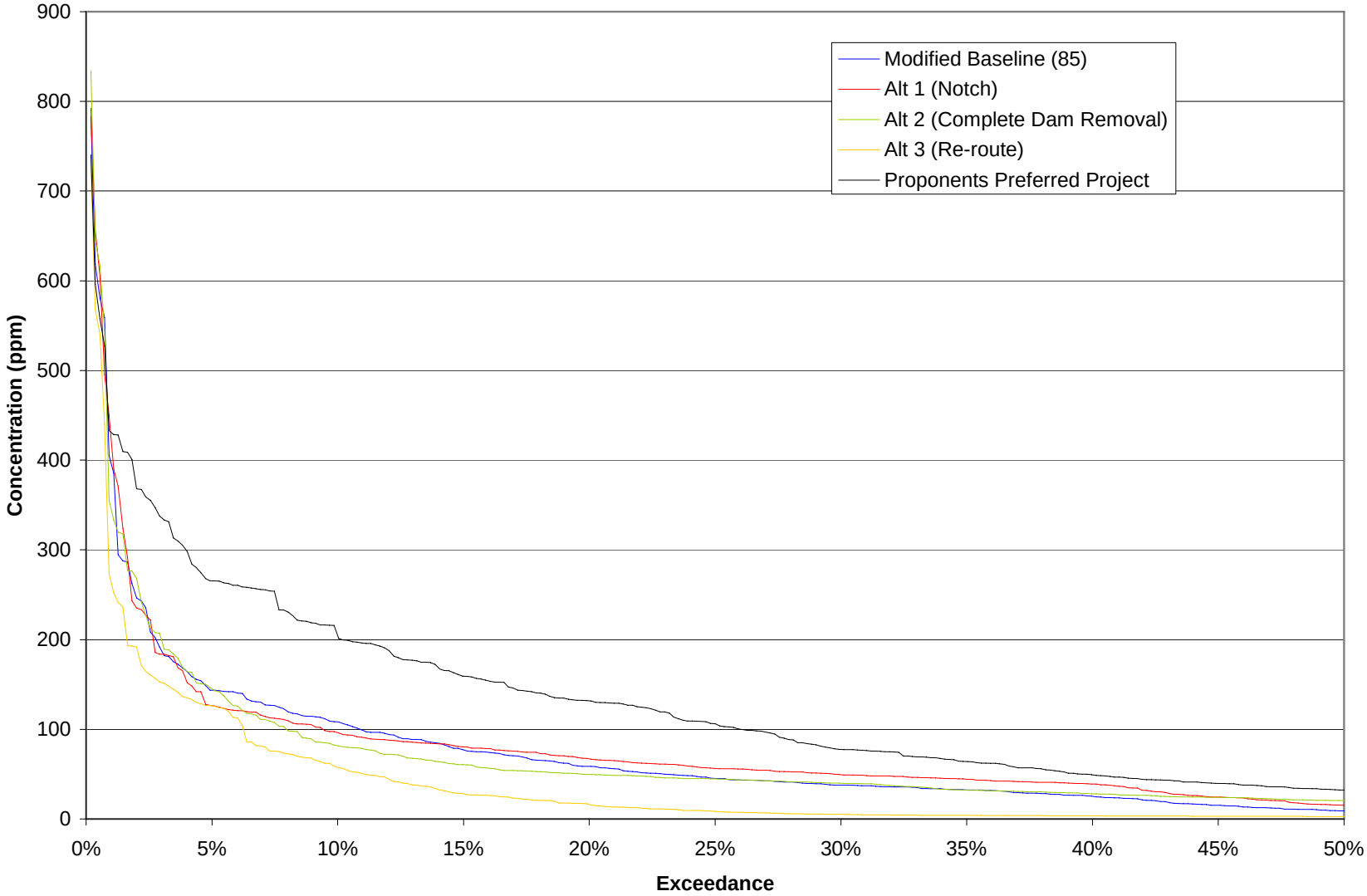


Figure P-12: Simulated Suspended Sediment Concentration Exceedance at Reach 4.7 for a Dry Year

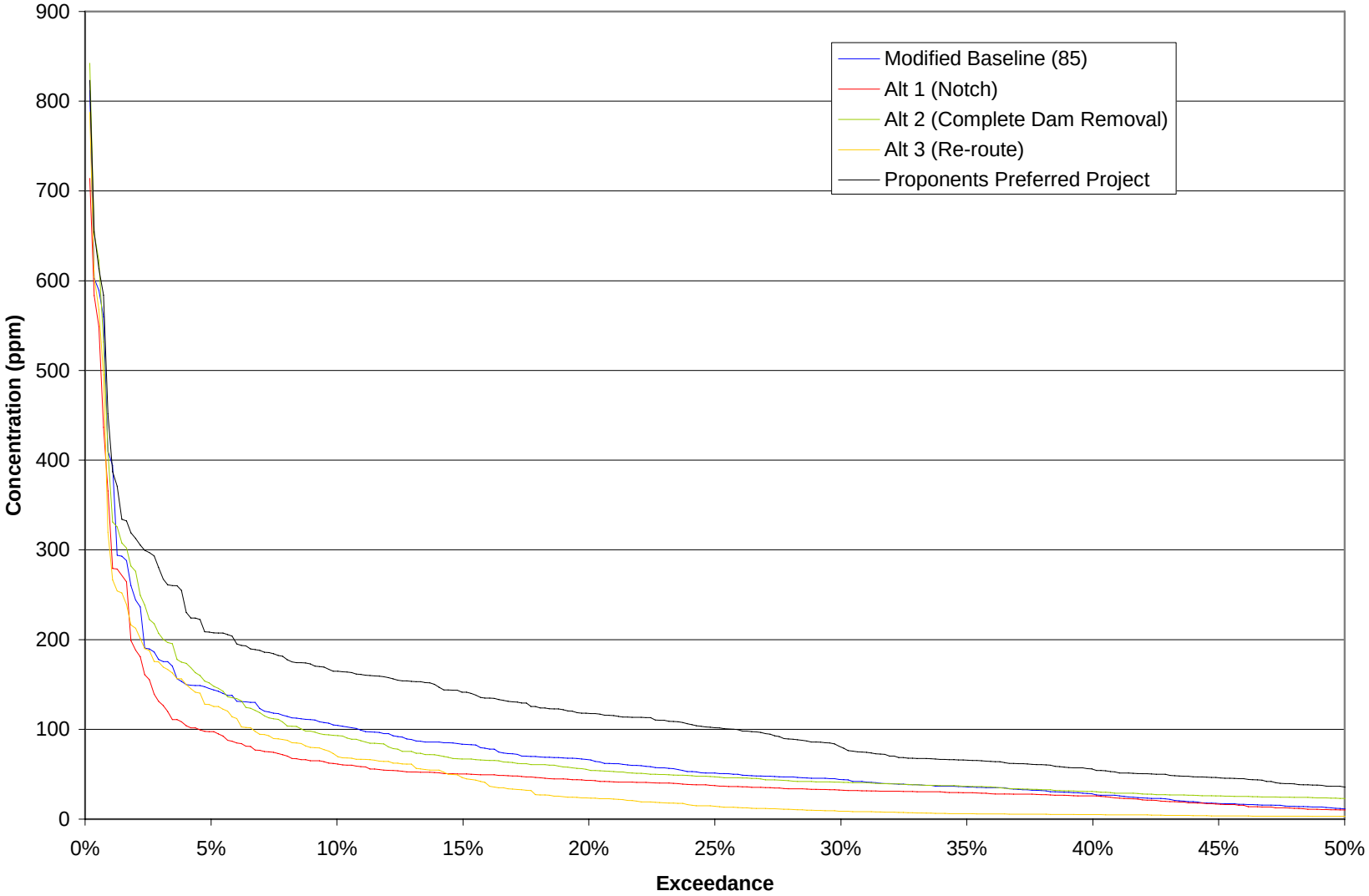


Figure P-13: Simulated Suspended Sediment Concentration Exceedance at Reach 5 for a Dry Year

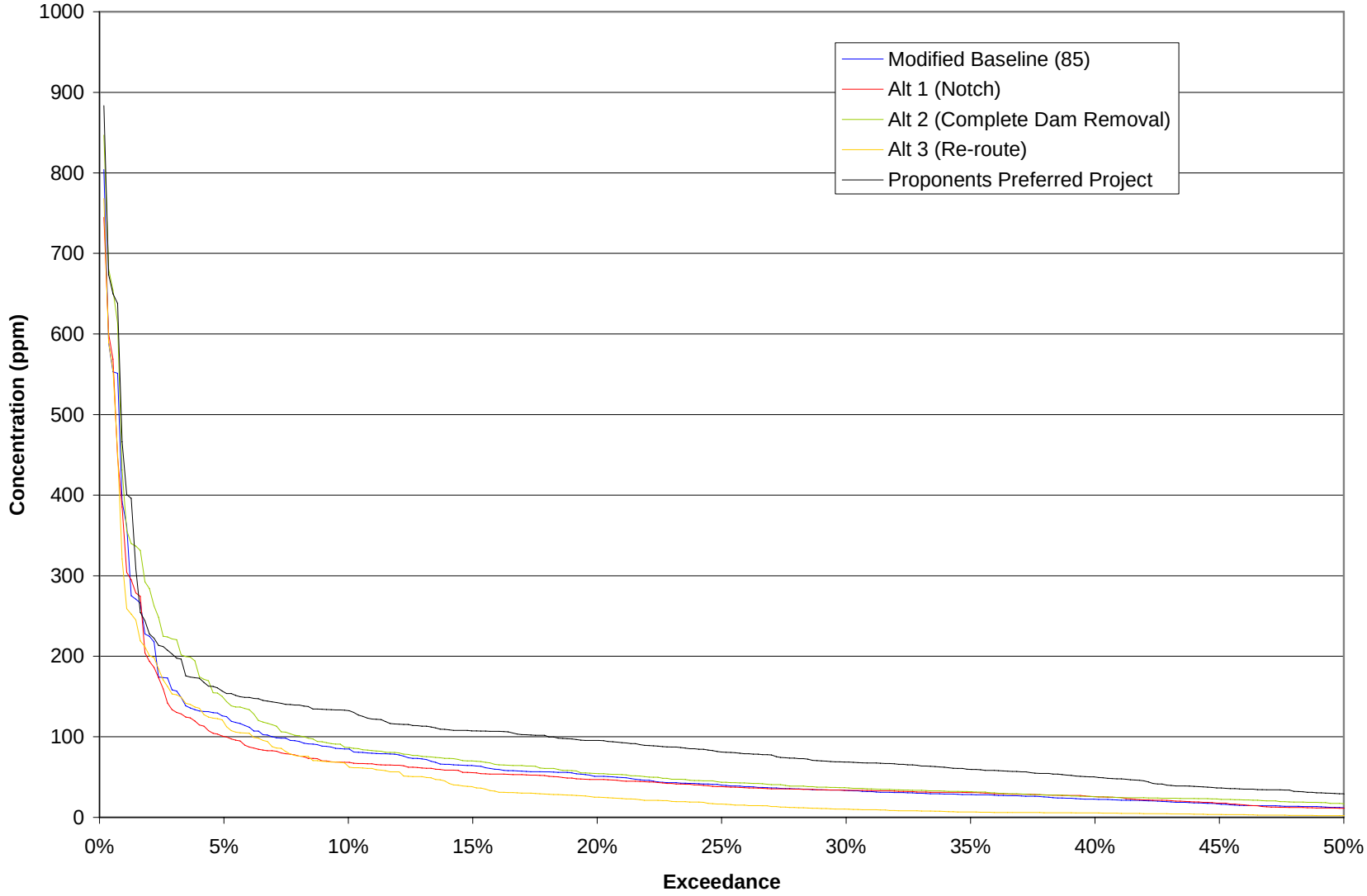


Figure P-14: Simulated Suspended Sediment Concentration Exceedance at Reach 6.3 for a Dry Year

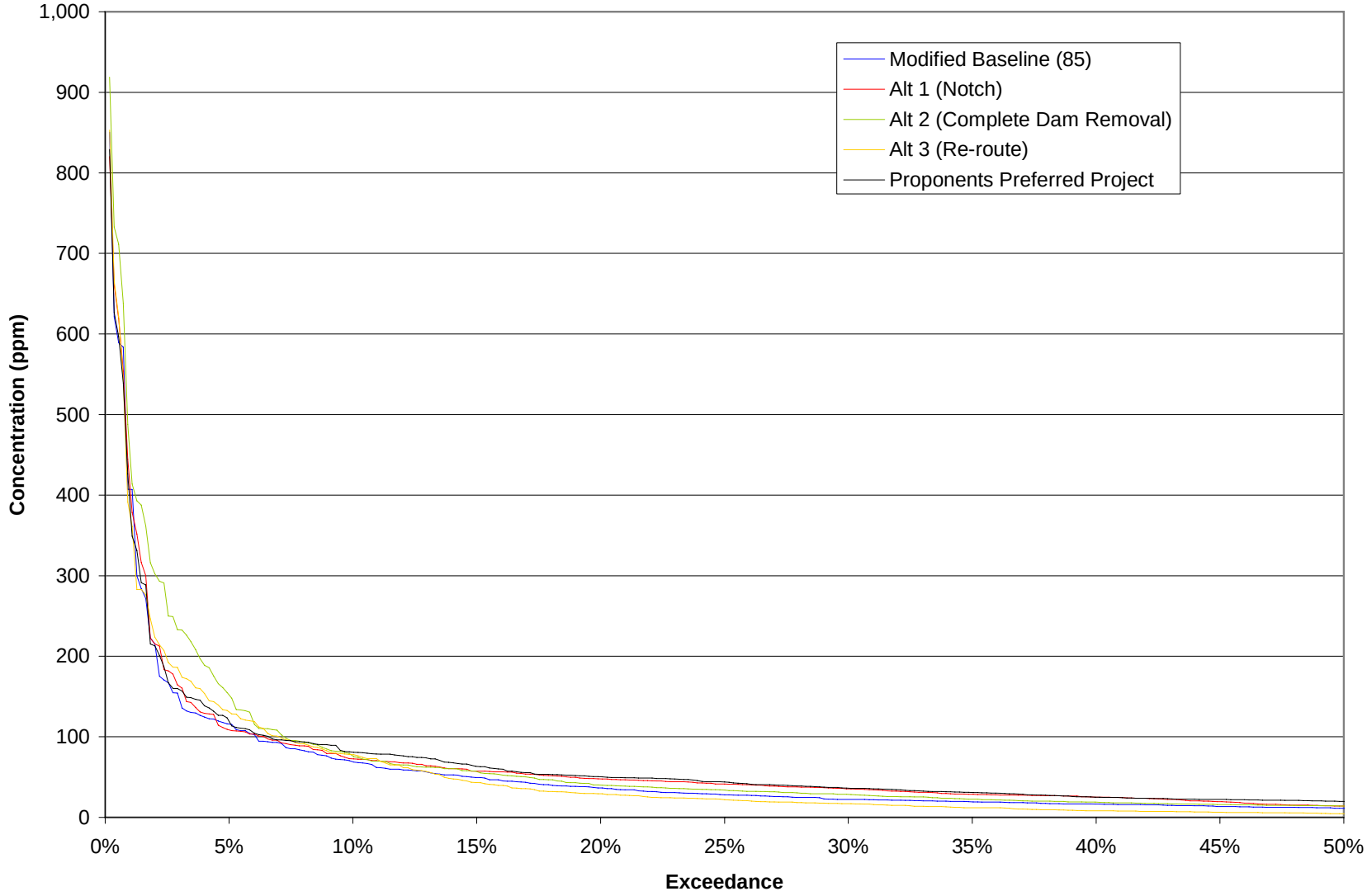


Figure P-15: Simulated Suspended Sediment Concentration Exceedance at Reach 6.7 for a Dry Year

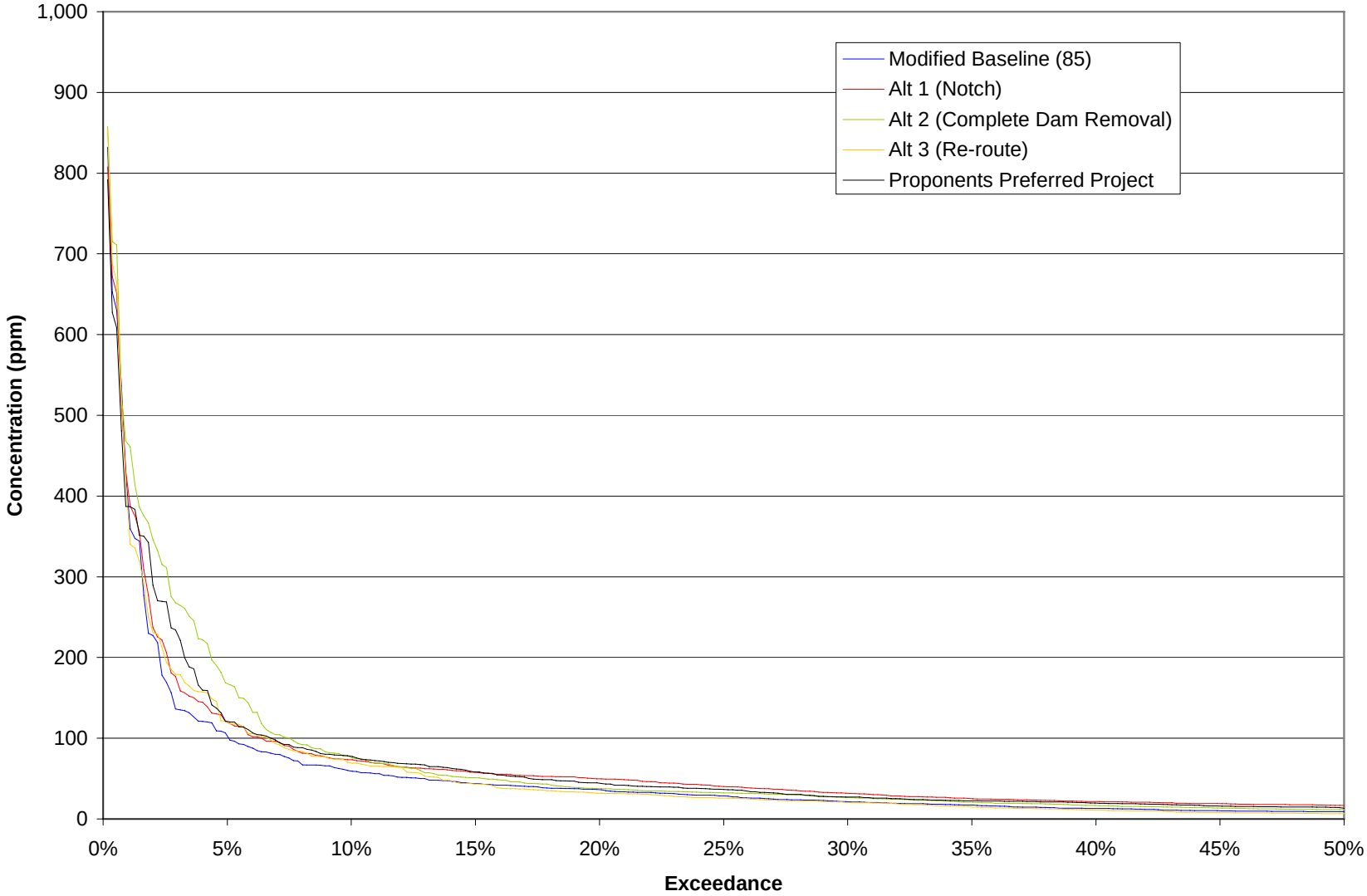


Figure P-16: Simulated Suspended Sediment Concentration Exceedance at Reach 7.3 for a Dry Year

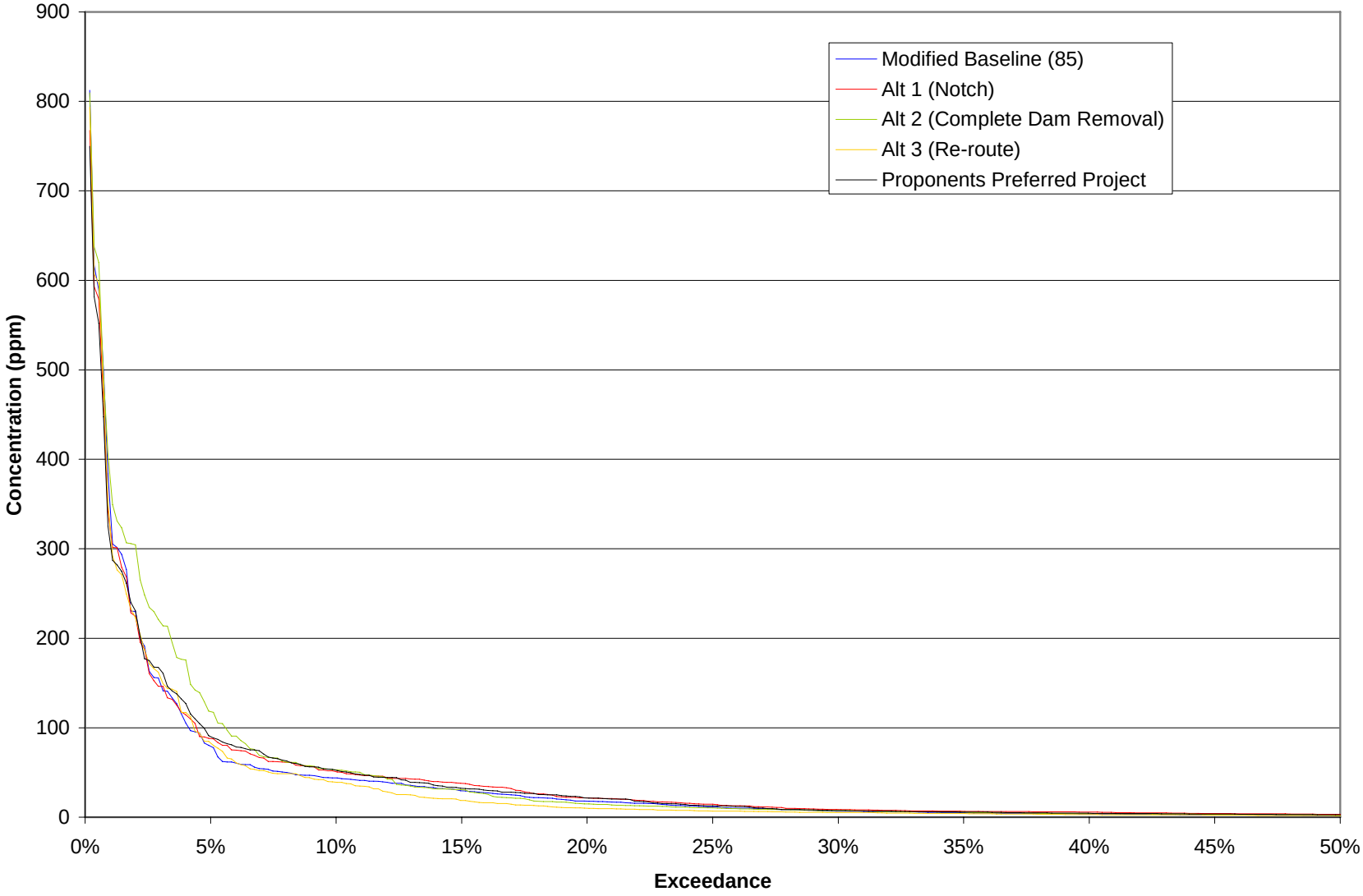


Figure P-17: Simulated Suspended Sediment Concentration Exceedance at Reach 7.7 for a Dry Year

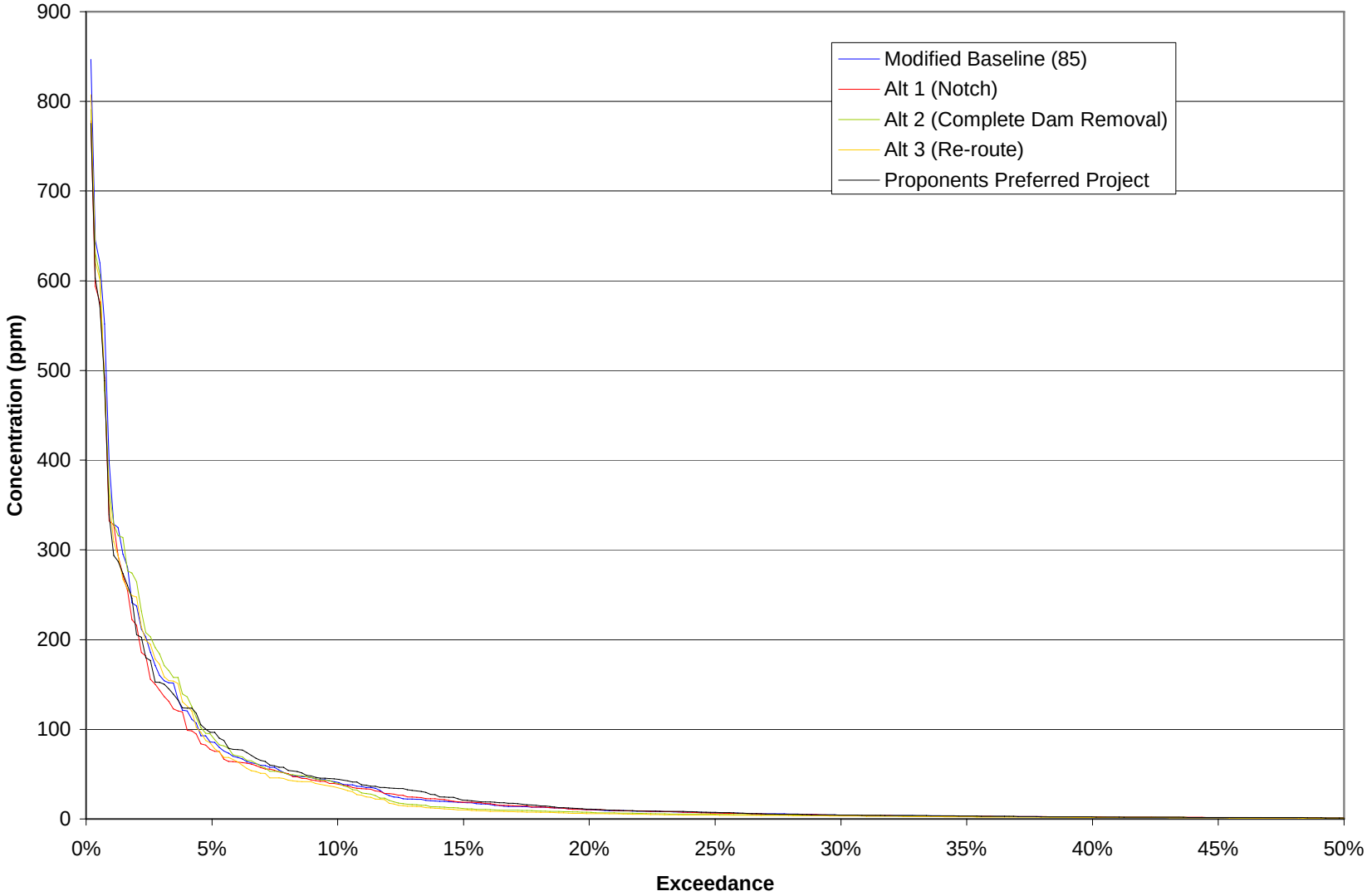


Figure P-18: Simulated Suspended Sediment Concentration Exceedance at Reach 8.3 for a Dry Year

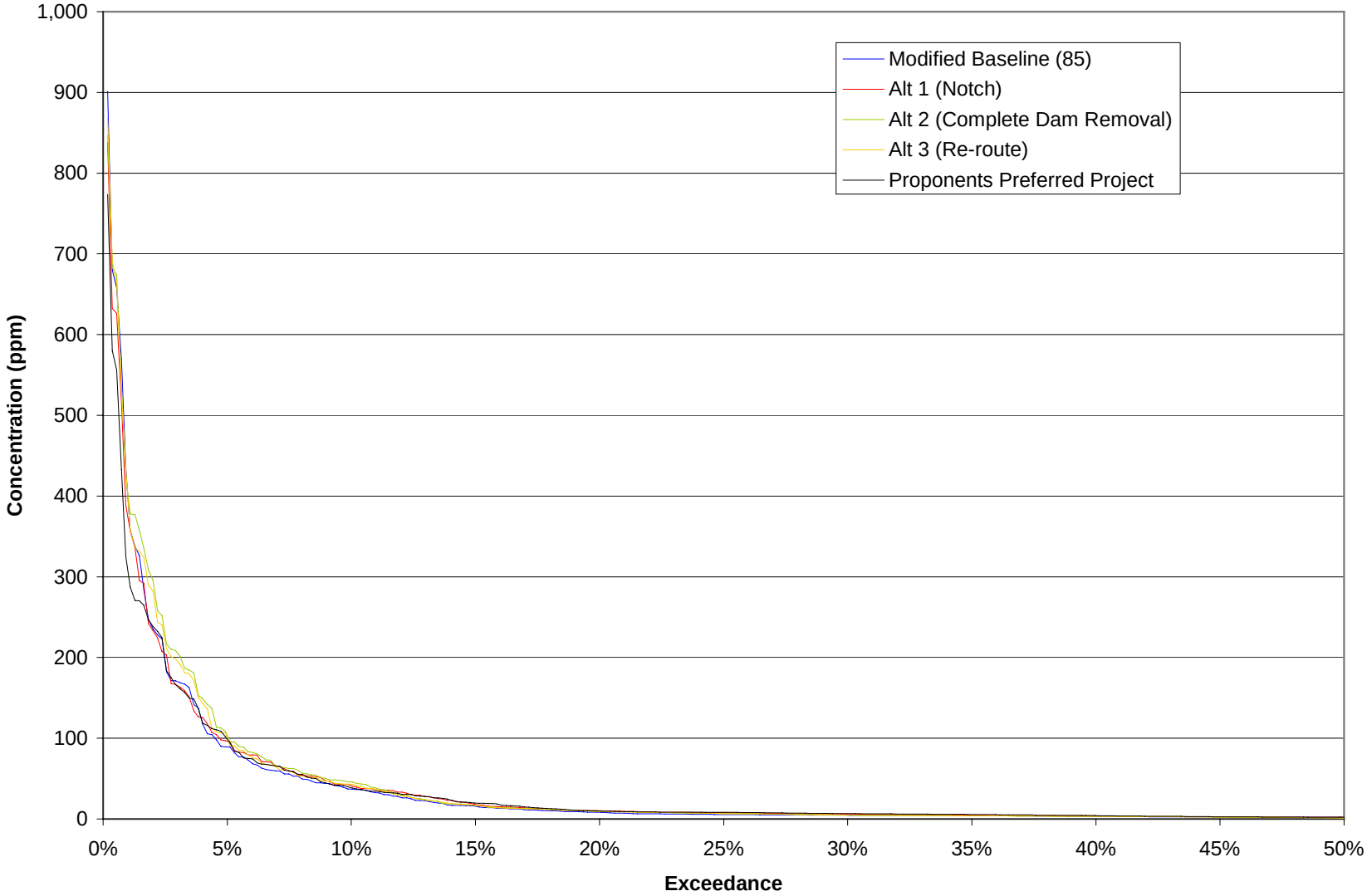


Figure P-19: Simulated Suspended Sediment Concentration Exceedance at Reach 8.7 for a Dry Year

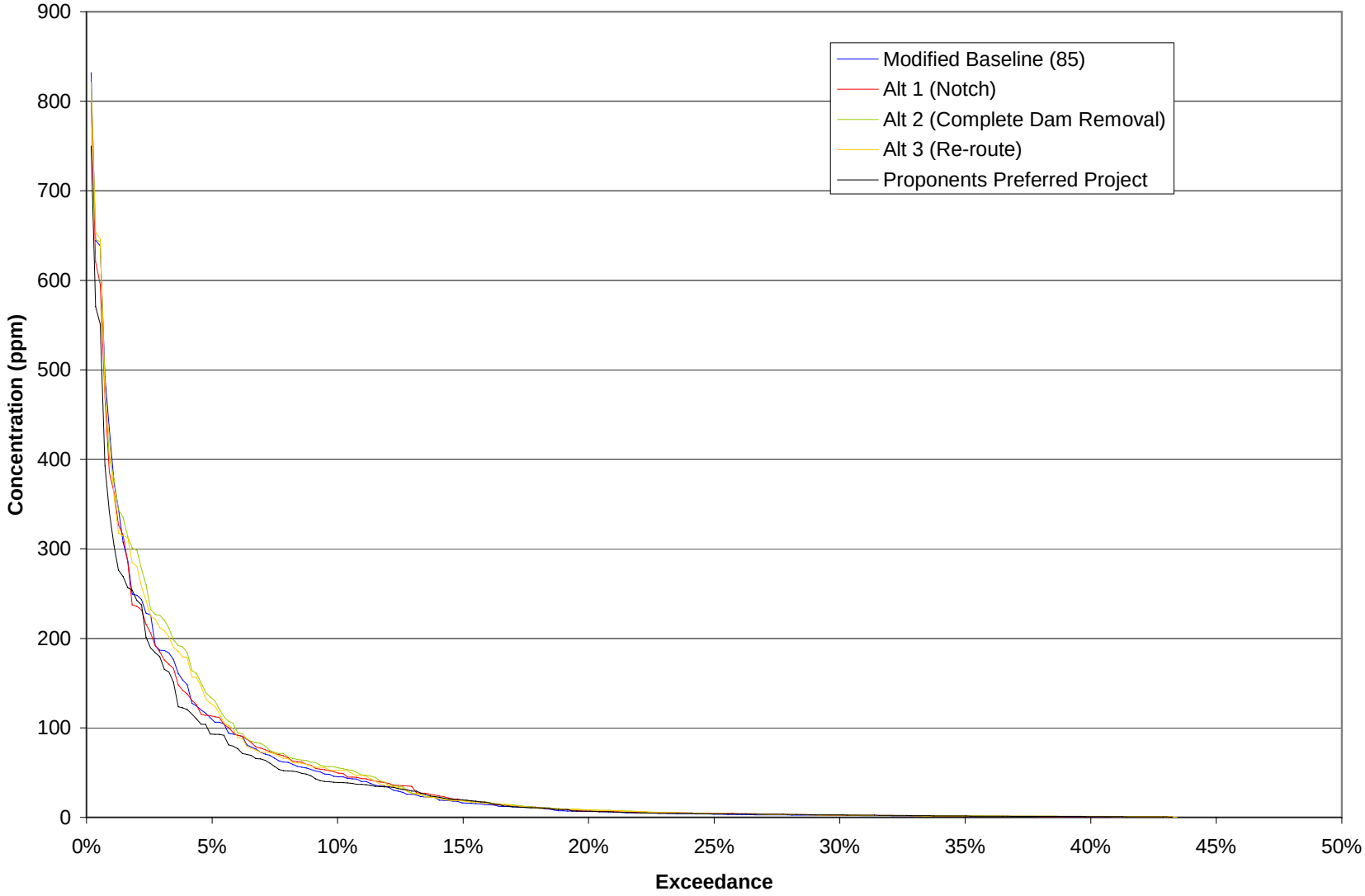


Figure B-20: Simulated Suspended Sediment Concentration Exceedance at Reach 9 for a Dry Year

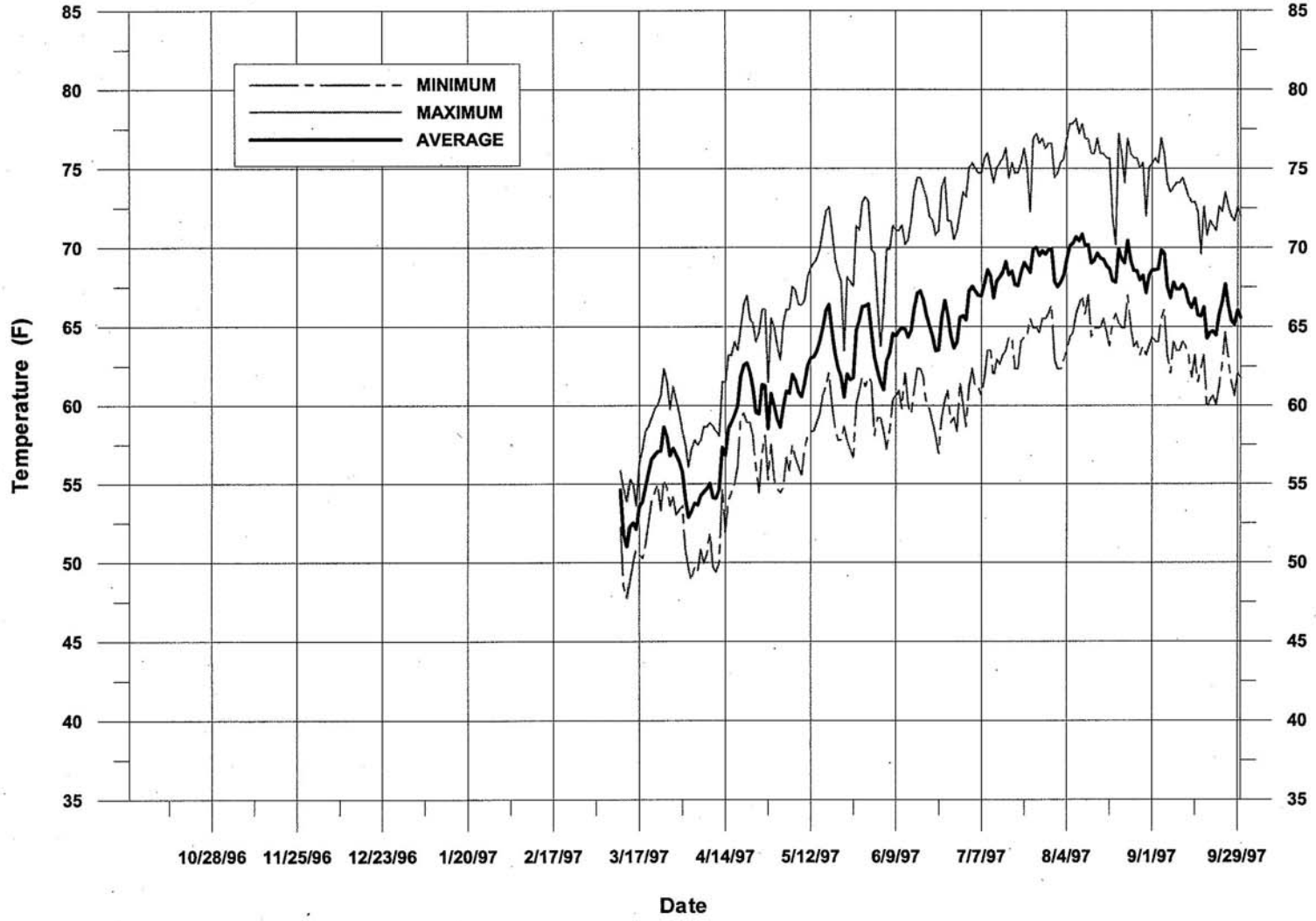
Appendix Q

WATER QUALITY

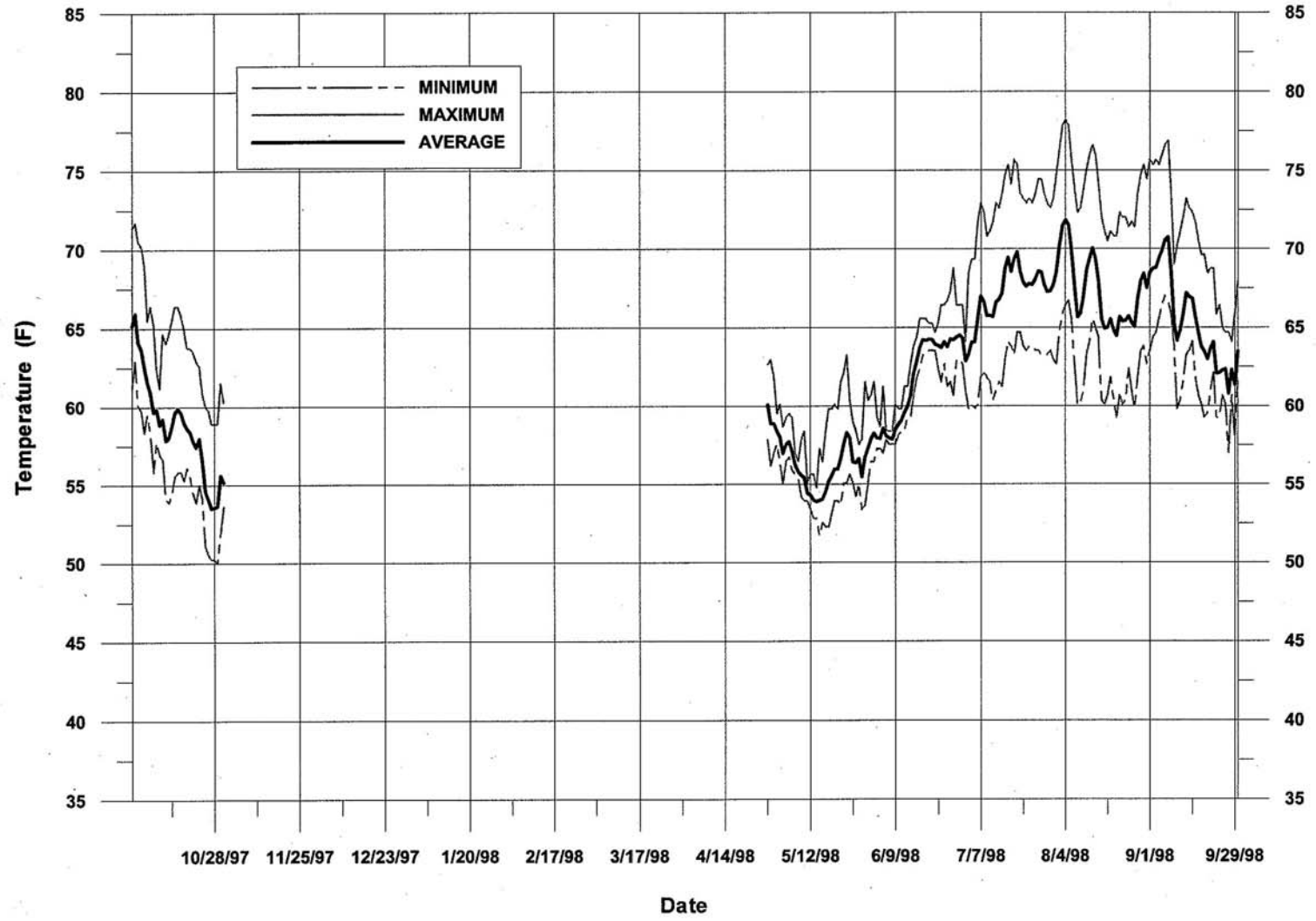
Appendix Q-1

MPWMD Temperature Data Graphs for Carmel River above San Clemente Reservoir, 1997-2003

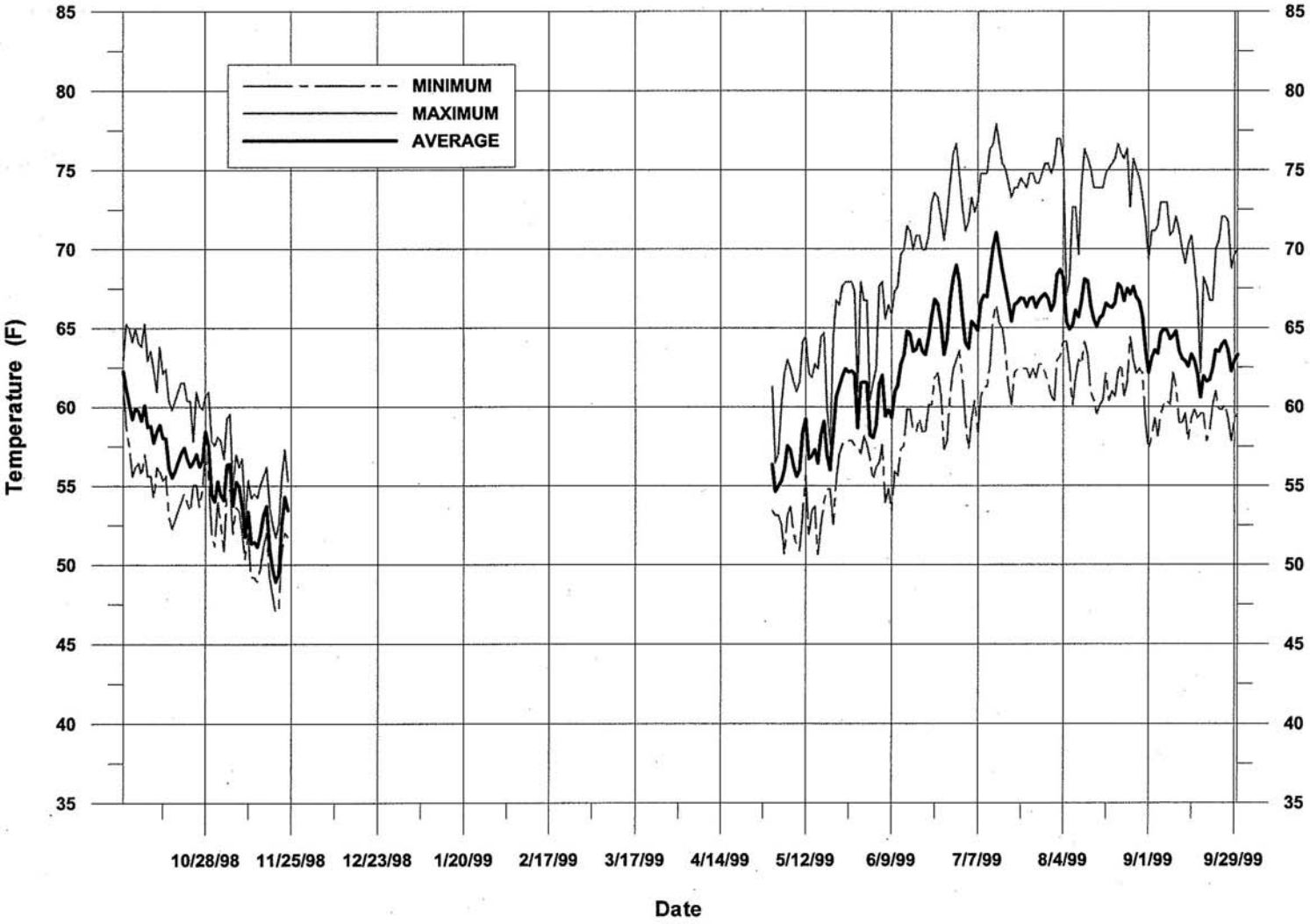
Carmel River Water Temperature at the Above San Clemente Site
WY 1997



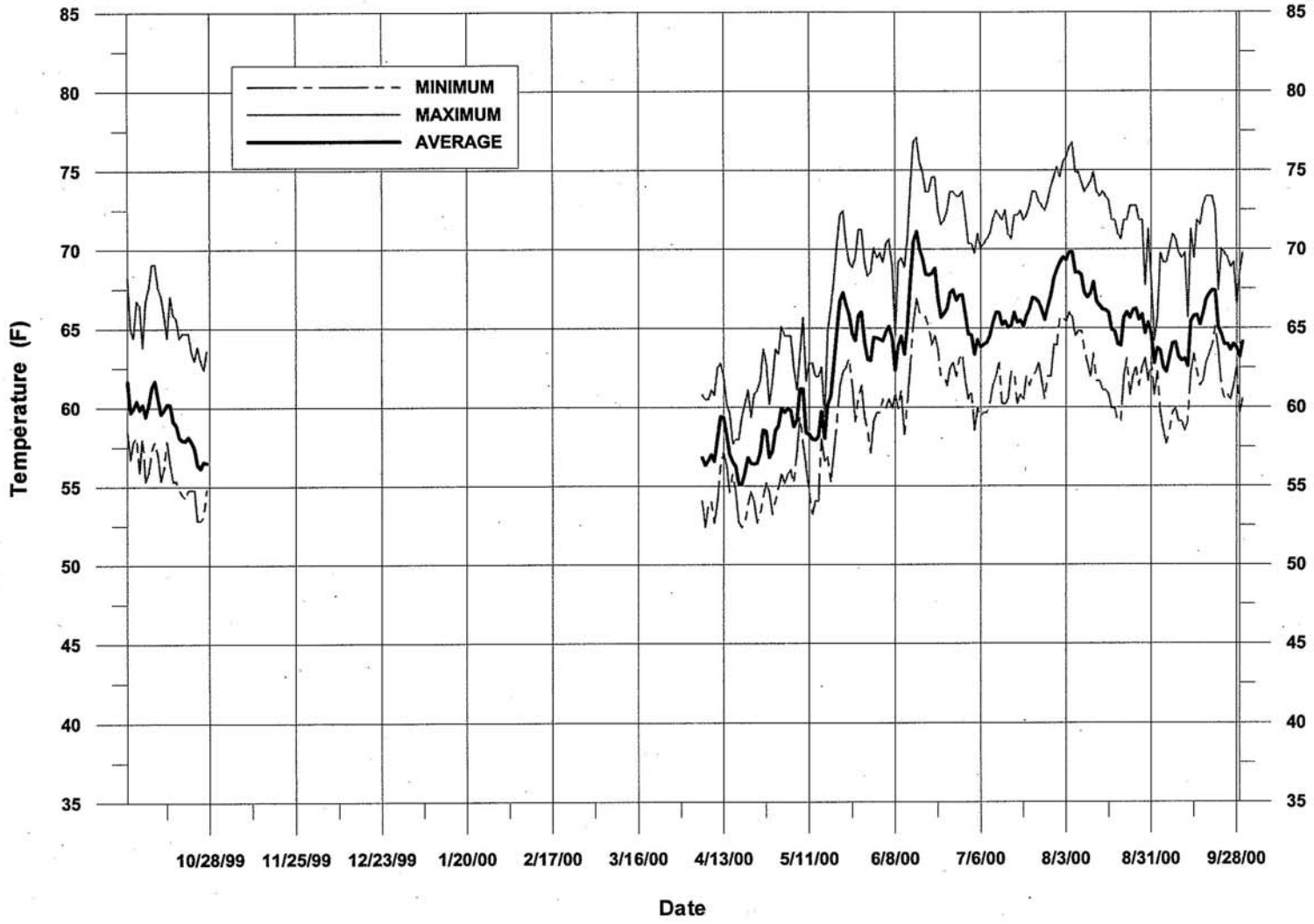
Carmel River Water Temperature at the Above San Clemente Site
WY 1998



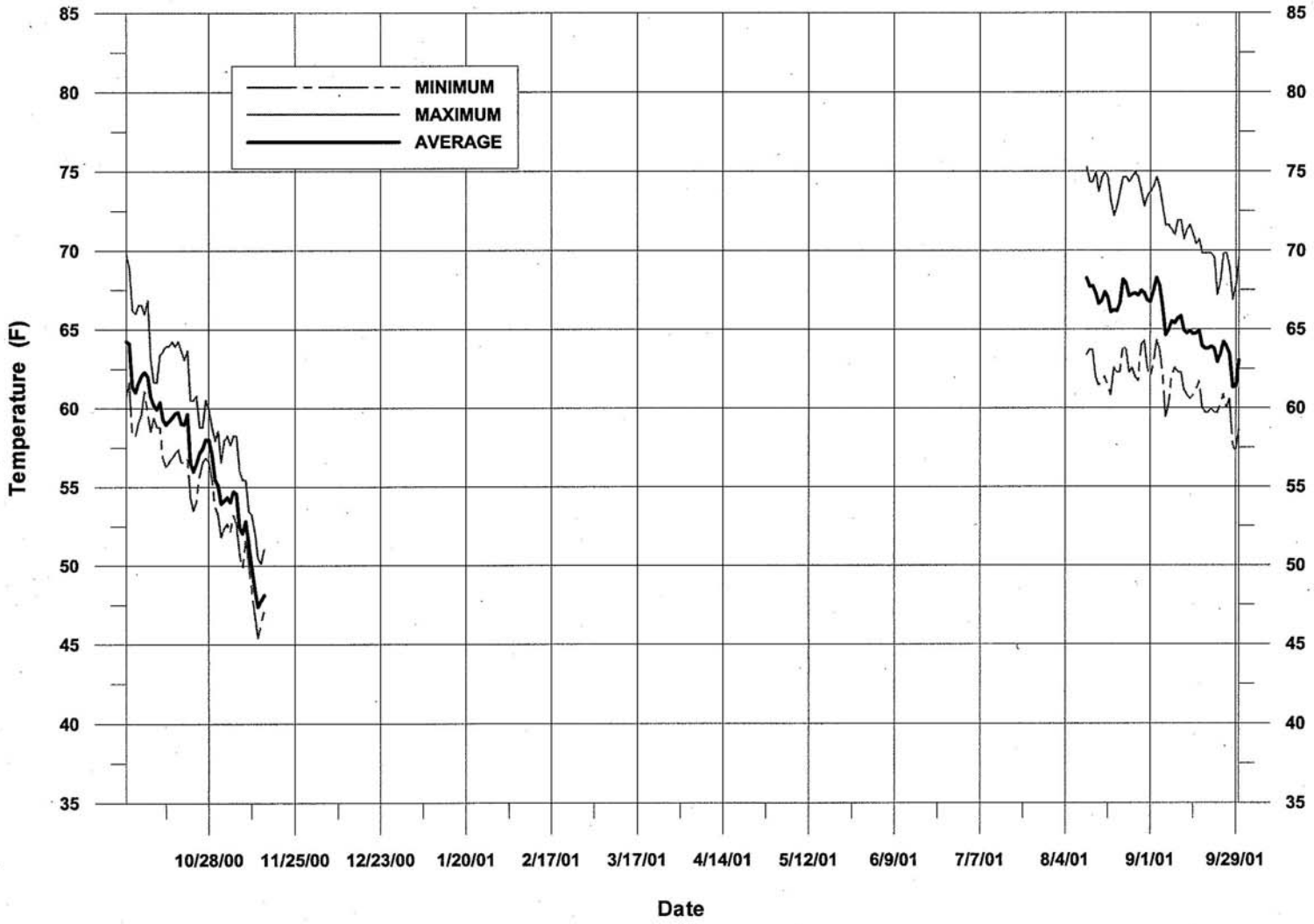
Carmel River Water Temperature at the Above San Clemente Site
WY 1999



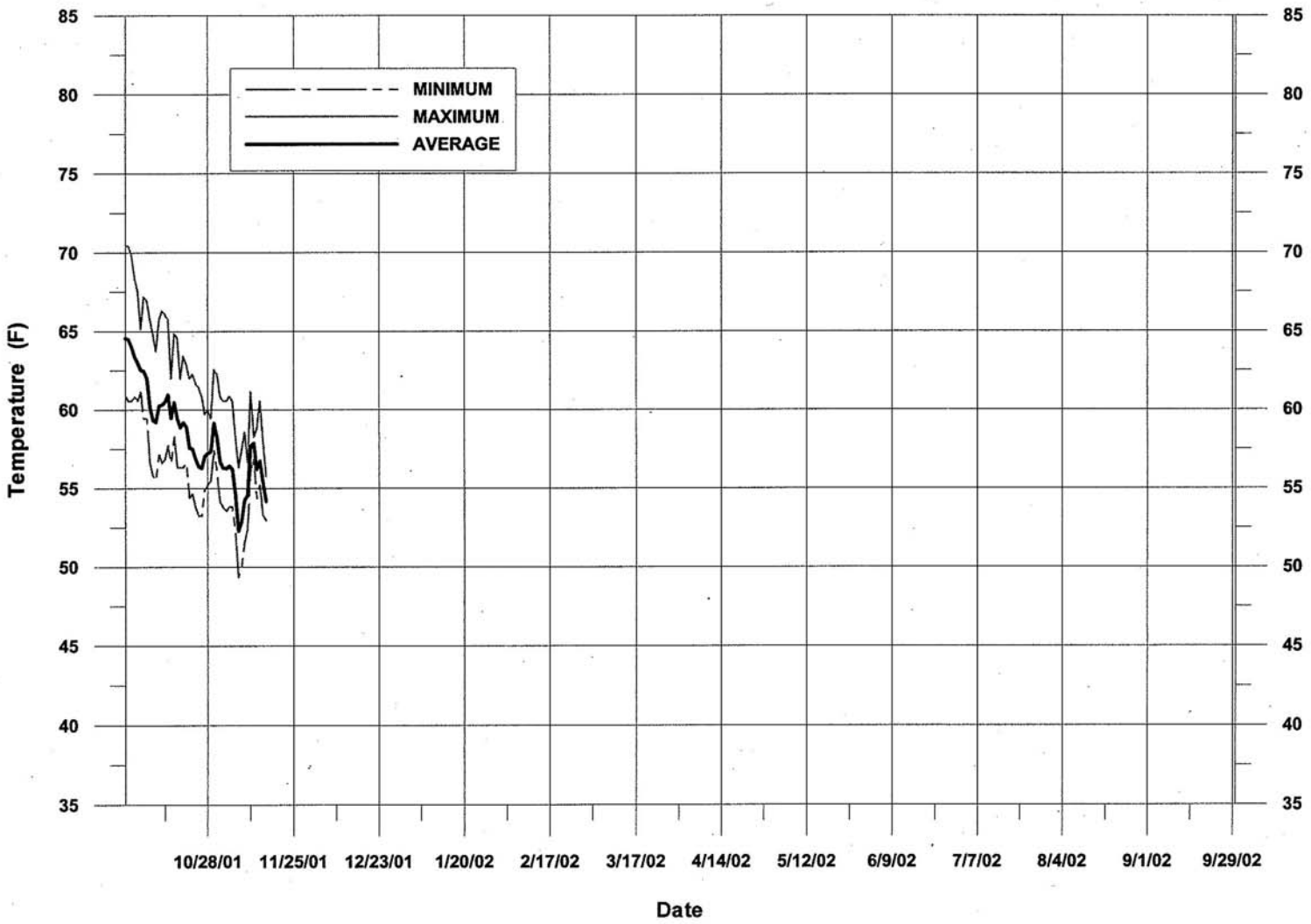
Carmel River Water Temperature at the Above San Clemente Site
WY 2000



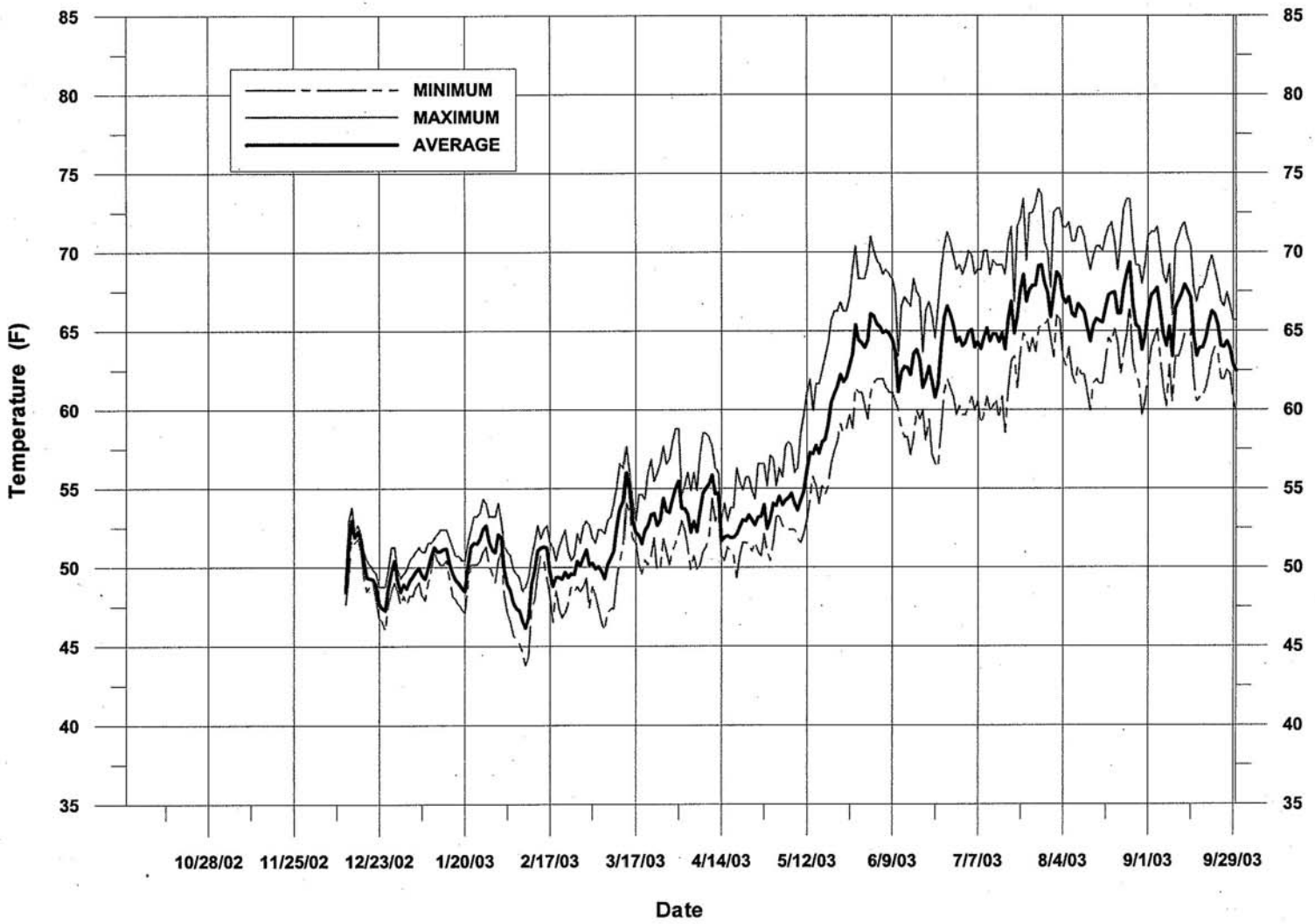
Carmel River Water Temperature at the Above San Clemente Site
WY 2001



Carmel River Water Temperature at the Above San Clemente Site
WY 2002



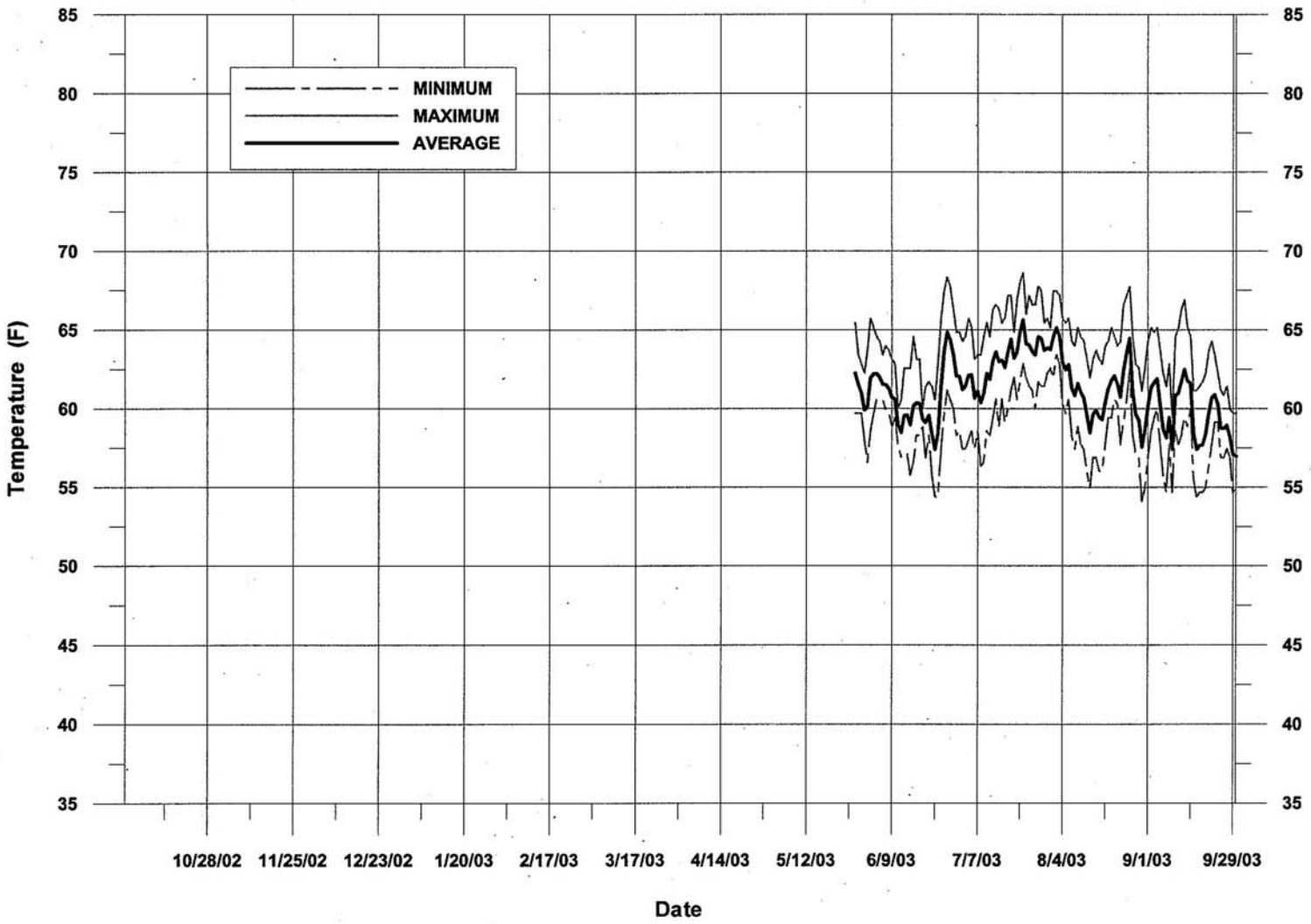
Carmel River Water Temperature at the Above San Clemente Site
WY 2003



Appendix Q-2

MPWMD Temperature Data Graphs for San Clemente Creek above San Clemente Reservoir, 2003

San Clemente Creek Water Temperature
WY 2003



Appendix Q-3. ENTRIX Surface Water and Porewater Characterization Results and Criteria Comparison, November 2002

Parameter	Units	Carmel River Arm Samples												San Clemente Creek Arm Samples					
		CRS-0-01	WQO[1]	SCR-1-01	WQO[1]	CRG-1-01	WQO[1]	CRG-2-01	WQO[1]	CRS-2-01	WQO[1]	TribPond-1-01	WQO[1]	SCCG-1-01	WQO[1]	SCCG-2-01	WQO	SCCS-2-01	WQO[1]
Antimony (An)	ug/L	<10		<10		<10		<10		<10		<10		<10		<10		<10	
Arsenic (As)	ug/L	<1.0		<1.0		**4.1**		<1.0		<1.0		**1.3**		**6.0**		**2.2**		<1.0	
Barium (Ba)	ug/L	**40**		**41**		**35**		**49**		**41**		**180**		**32**		**25**		**30**	
Beryllium	ug/L	<0.50		<0.50		<0.50		<0.50		<0.50		<0.50		<0.50		<0.50		<0.50	
Cadmium (Cd)	ug/L	<0.50	2.9	<0.50	3.0	<0.50	2.6	<0.50	3.0	<0.50	3.0	<0.50	7.8	<0.50	2.9	<0.50	2.2	<0.50	2.2
Chromium (Cr)	ug/L	<2.0	234	<2.0	248	**3.9**	207	**2.5**	248	<2.0	248	**4.7**	708	**2.5**	234	<2.0	178	<2.0	172
Cobalt (Co)	ug/L	<10		<10		<10		<10		<10		<10		<10		<10		<10	
Copper (Cu)	ug/L	<0.50	12	<0.50	13	<0.50	10	**0.66**	13	<0.50	13	<0.50	38	<0.50	12	<0.50	9.0	<0.50	8.6
Lead (Pb)	ug/L	<1.0	3.6	<1.0	3.9	<1.0	3.1	<1.0	3.9	<1.0	3.9	<1.0	15	<1.0	3.6	<1.0	2.5	<1.0	2.4
Mercury (Hg)	ug/L	<0.010		<0.010		<0.010		<0.010		<0.010		<0.010		<0.010		<0.010		<0.010	
Molybdenum (Mb)	ug/L	<10		<10		<10		<10		<10		<10		<10		<10		<10	
Nickel (Ni)	ug/L	<2.0	69	<2.0	73	<2.0	61	**2.2**	73	<2.0	73	<2.0	217	<2.0	69	<2.0	52	<2.0	50
Selenium (Se)	ug/L	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
Silver (Si)	ug/L	<0.20	6.2	<0.20	6.9	<0.20	4.7	<0.20	6.9	<0.20	6.9	<0.20	63	<0.20	6.2	<0.20	3.4	<0.20	3.2
Thallium (Th)	ug/L	<5.0		<5.0		<5.0		<5.0		<5.0		<5.0		<5.0		<5.0		<5.0	
Vanadium (Vn)	ug/L	<10		<10		<10		<10		<10		<10		<10		<10		<10	
Zinc (Zn)	ug/L	<5.0	157	<5.0	167	**5.0**	138	<5.0	167	<5.0	167	<5.0	493	**5.6**	157	**6.4**	118	<5.0	114
pH Value	pH units	8.1	6.5-9.0	8.1	6.5-9.0	6.7	6.5-9.0	6.5	6.5-9.0	8.3	6.5-9.0	7.6	6.5-9.0	6.9	6.5-9.0	6.6	6.5-9.0	6.9	6.5-9.0
Conductivity (EC)	umhos/cm	310	NA	290	NA	280	NA	350	NA	320	NA	1200	NA	320	NA	280	NA	280	NA
Carbonate Alkalinity ($CaCO_3$)	mg/L	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA
Bicarbonatge Alkalinity ($CaCO_3$)	mg/L	150	NA	150	NA	160	NA	190	NA	150	NA	610	NA	170	NA	140	NA	130	NA
Total Alkalinity ($CaCO_3$)	mg/L	150	NA	150	NA	160	NA	190	NA	150	NA	610	NA	170	NA	140	NA	130	NA
Hardness ($CaCO_3$)	mg/L	140	NA	150	NA	120	NA	150	NA	150	NA	540	NA	140	NA	100	NA	96	NA
Total Dissolved Solids	mg/L	200	NA	190	NA	180	NA	230	NA	200	NA	790	NA	210	NA	180	NA	180	NA
Nitrate (as N)	mg/L	<0.1		<0.1		<0.1		<0.1		<0.1		<0.1		<0.1		<0.1		<0.1	
Nitrite (as N)	mg/L	<0.1		<0.1		<0.1		<0.1		<0.1		<0.1		<0.1		<0.1		<0.1	
Chloride (Cl)	mg/L	8		7.9		7.8		7.8		7.6		110		6.6		12		15	
Sulfate (SO_4)	mg/L	32		32		3.8		10		33		31		11		4.7		6.7	
Fluoride (F)	mg/L	0.21		0.25		0.14		0.17		0.21		0.51		0.15		0.16		0.53	
Calcium (Ca)	mg/L	37		38		32		41		38		110		30		23		21	
Magnesium (Mg)	mg/L	13		13		8.8		12		13		66		16		11		10	
Potassium (K)	mg/L	3.1		3.1		3.4		3.1		3.0		7.0		4.2		2.4		2.7	
Sodium (Na)	mg/L	15		15		13		15		15		99		17		18		25	
Iron (Fe)	mg/L	<0.05	1.0	<0.05	1.0	12	1.0	11	1.0	<0.05	1.0	<0.05	1.0	4.4	1.0	7	1.0	0.33	1.0
Manganese (Mn)	mg/L	<0.01		<0.01		1.8		0.75		<0.01		3.5		1.1		0.65		0.29	
Ammonia Nitrogen (as N)	mg/L	<0.01		<0.01		0.4		1.5		0.17		0.9		0.38		0.57		0.22	

[1]Water Quality Objective (WQO) for metals derived from CEPA; hardness-based chronic criteria for aquatic life.
WQO for Fe derived from CEPA.

Appendix Q-4. Reservoir Fixed Station Water Quality Summary - Summer 2003 Drawdown

Daily Minimum, Maximum, and Mean Values of Temperature, Conductivity, Dissolved Oxygen, pH, and Turbidity

	Temperature (C)			Conductivity (mS/cm)			Dissolved Oxygen (mg/L)			pH			Turbidity (NTU)		
Date	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
6/11/03	16.81	17.05	16.95	0.232	0.236	0.233	6.96	7.32	7.14	7.85	7.90	7.88	0.00	1.00	0.14
6/12/03	16.18	16.77	16.48	0.229	0.233	0.232	6.83	7.43	7.07	7.78	7.88	7.83	0.00	1.00	0.27
6/13/03	16.31	16.94	16.60	0.231	0.235	0.234	6.77	7.52	7.13	7.76	7.91	7.85	0.00	1.00	0.19
6/14/03	16.39	17.05	16.70	0.231	0.236	0.235	6.57	7.55	7.13	7.72	7.91	7.84	0.00	1.00	0.33
6/15/03	16.21	17.20	16.60	0.234	0.236	0.235	6.60	7.38	7.09	7.73	7.92	7.82	0.00	1.00	0.46
6/16/03	16.42	16.96	16.67	0.234	0.237	0.236	6.75	7.60	7.14	7.74	7.91	7.83	0.00	5.00	0.42
6/17/03	16.71	17.28	16.93	0.232	0.236	0.234	6.75	8.48	7.60	7.76	7.94	7.85	0.00	0.60	0.32
6/18/03	16.80	17.42	17.06	0.233	0.236	0.234	7.16	8.34	7.74	7.71	7.90	7.80	0.20	1.80	0.66
6/19/03	16.93	17.41	17.11	0.232	0.238	0.235	6.87	8.10	7.47	7.64	7.93	7.77	0.60	1.50	0.91
6/20/03	16.24	17.00	16.67	0.235	0.238	0.236	6.98	7.75	7.46	7.71	7.82	7.77	0.50	1.20	0.87
6/21/03	16.67	17.08	16.86	0.235	0.246	0.240	7.17	7.97	7.53	7.72	7.87	7.79	0.60	1.10	0.82
6/22/03	16.34	17.12	16.73	0.243	0.246	0.245	6.93	7.81	7.39	7.71	7.88	7.80	1.00	2.00	1.02
6/23/03	16.07	17.61	16.69	0.245	0.251	0.248	6.96	7.98	7.45	7.70	7.95	7.81	0.00	2.00	1.09
6/24/03	16.11	17.84	16.90	0.248	0.255	0.252	6.86	7.63	7.32	7.53	7.77	7.67	1.00	3.00	1.67
6/25/03	16.73	18.73	17.67	0.255	0.271	0.262	5.31	6.87	6.36	7.17	7.52	7.34	2.00	8.00	4.59
6/26/03	17.88	24.31	18.84	0.269	0.460	0.275	4.65	7.93	5.17	7.15	7.89	7.20	8.00	9.00	8.67
6/27/03	18.75	20.69	19.55	0.274	0.282	0.277	4.39	5.38	4.84	7.10	7.23	7.16	9.00	12.00	10.18
6/28/03	19.14	20.82	19.95	0.276	0.285	0.279	4.38	5.56	4.94	7.06	7.23	7.15	8.00	13.00	10.50
6/29/03	19.13	20.61	19.89	0.278	0.287	0.282	4.54	5.78	5.12	7.07	7.24	7.15	7.00	15.00	9.46
6/30/03	19.02	20.10	19.57	0.278	0.287	0.282	4.87	6.14	5.41	7.09	7.27	7.18	7.00	11.00	8.50
7/1/03	18.67	20.06	19.41	0.276	0.283	0.280	5.59	6.49	6.02	7.17	7.30	7.22	6.00	8.00	7.00
7/2/03	18.49	19.73	19.17	0.279	0.283	0.281	5.78	6.59	6.18	7.18	7.26	7.22	7.00	10.00	8.38
7/3/03	18.35	19.96	19.11	0.278	0.282	0.280	5.97	6.76	6.33	7.20	7.31	7.24	7.00	11.00	8.71
7/4/03	18.38	20.25	19.29	0.277	0.283	0.279	6.15	6.94	6.53	7.22	7.36	7.27	7.00	10.00	7.39
7/5/03	18.60	20.55	19.50	0.278	0.283	0.281	5.98	6.99	6.44	7.19	7.38	7.27	6.00	10.00	6.98
7/6/03	18.70	20.05	19.39	0.278	0.284	0.282	5.91	6.90	6.37	7.22	7.36	7.28	4.00	8.00	5.88
7/7/03	18.76	20.08	19.40	0.279	0.284	0.282	5.91	6.74	6.32	7.25	7.35	7.28	5.00	9.00	5.90
7/8/03	18.66	20.05	19.27	0.280	0.285	0.282	6.13	7.03	6.45	7.27	7.39	7.31	6.00	10.00	6.96
7/9/03	18.63	19.98	19.28	0.282	0.286	0.284	5.98	6.81	6.28	7.22	7.32	7.27	6.00	10.00	7.56
7/10/03	18.83	20.37	19.51	0.279	0.287	0.283	5.98	6.86	6.31	7.22	7.34	7.27	8.00	11.00	8.92
7/11/03	18.99	20.45	19.65	0.275	0.285	0.280	5.99	7.08	6.36	7.24	7.39	7.30	8.00	11.00	9.25
7/12/03	19.02	20.65	19.70	0.272	0.281	0.277	6.12	6.98	6.38	7.25	7.39	7.31	8.00	12.00	8.67
7/13/03	19.22	20.52	19.80	0.274	0.279	0.277	5.64	6.53	6.01	7.26	7.32	7.29	8.00	14.00	9.56
7/14/03	19.10	20.30	19.67	0.251	0.278	0.275	5.50	5.82	5.66	7.26	7.34	7.30	8.00	13.00	10.69
7/15/03	19.11	20.28	19.79	0.274	0.277	0.275	5.28	5.70	5.56	7.27	7.33	7.30	8.00	14.00	10.00
7/16/03	19.04	20.12	19.61	0.273	0.276	0.275	5.11	5.51	5.30	7.22	7.29	7.26	10.00	23.00	14.19

Appendix Q-4. Reservoir Fixed Station Water Quality Summary - Summer 2003 (continued)

Daily Minimum, Maximum, and Mean Values of Temperature, Conductivity, Dissolved Oxygen, pH, and Turbidity

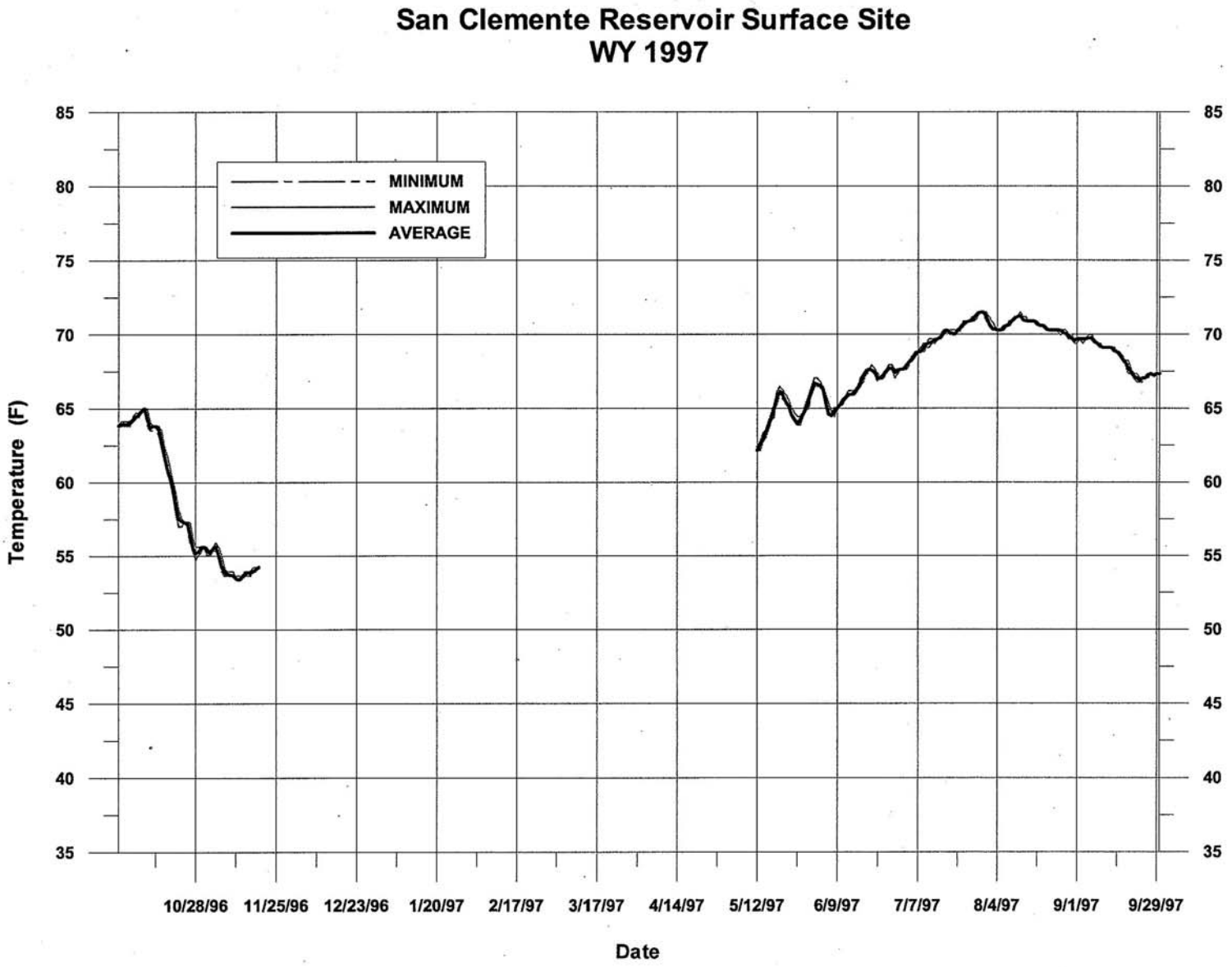
	Temperature (C)			Conductivity (mS/cm)			Dissolved Oxygen (mg/L)			pH			Turbidity (NTU)		
Date	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
7/17/03	19.16	20.40	19.76	0.275	0.279	0.277	4.86	5.58	5.17	7.19	7.26	7.22	10.00	95.00	16.40
7/18/03	19.37	20.82	20.12	0.278	0.283	0.280	4.80	5.70	5.27	7.13	7.21	7.17	11.00	17.00	13.69
7/19/03	19.80	20.54	20.07	0.282	0.285	0.283	4.75	5.35	5.07	7.12	7.22	7.14	16.00	20.00	17.14
7/20/03	19.07	20.36	19.73	0.285	0.294	0.289	4.51	5.53	4.93	7.04	7.11	7.07	19.00	29.00	23.00
7/21/03	19.54	20.99	20.27	0.291	0.296	0.294	4.50	5.65	4.91	7.04	7.09	7.06	26.00	38.00	29.23
7/22/03	20.11	21.52	20.82	0.292	0.299	0.295	4.72	5.74	5.03	7.06	7.12	7.09	33.00	165.00	81.35
7/23/03	20.42	21.25	20.81	0.292	0.297	0.295	4.81	5.97	5.30	7.09	7.15	7.12	46.00	193.00	93.52
7/24/03	20.09	21.24	20.67	0.294	0.298	0.296	5.25	6.11	5.57	7.13	7.18	7.15	52.00	117	79.708
7/25/03	20.28	21.44	20.89	0.295	0.298	0.297	5.39	6.30	5.80	7.15	7.21	7.18	55.00	98.00	74.65
7/26/03	20.31	21.54	20.97	0.294	0.300	0.298	5.64	6.34	5.87	7.16	7.21	7.19	65.00	123.00	94.10
7/27/03	20.74	21.82	21.30	0.290	0.303	0.300	5.46	6.48	5.80	7.18	7.26	7.22	22.00	88.00	32.92
7/28/03	20.95	21.96	21.50	0.296	0.304	0.302	5.46	6.45	5.91	7.19	7.24	7.22	13.00	25.00	17.10
7/29/03	20.94	21.75	21.32	0.301	0.304	0.303	5.84	6.46	6.06	6.94	7.26	7.20	13.00	23.00	15.15
7/30/03	20.64	21.35	21.01	0.301	0.304	0.302	5.82	6.53	6.14	7.04	7.08	7.05	15.00	16.00	15.33
7/31/03	20.38	20.98	20.62	0.299	0.303	0.302	5.95	6.81	6.27	7.06	7.11	7.08	14.00	16.00	14.65

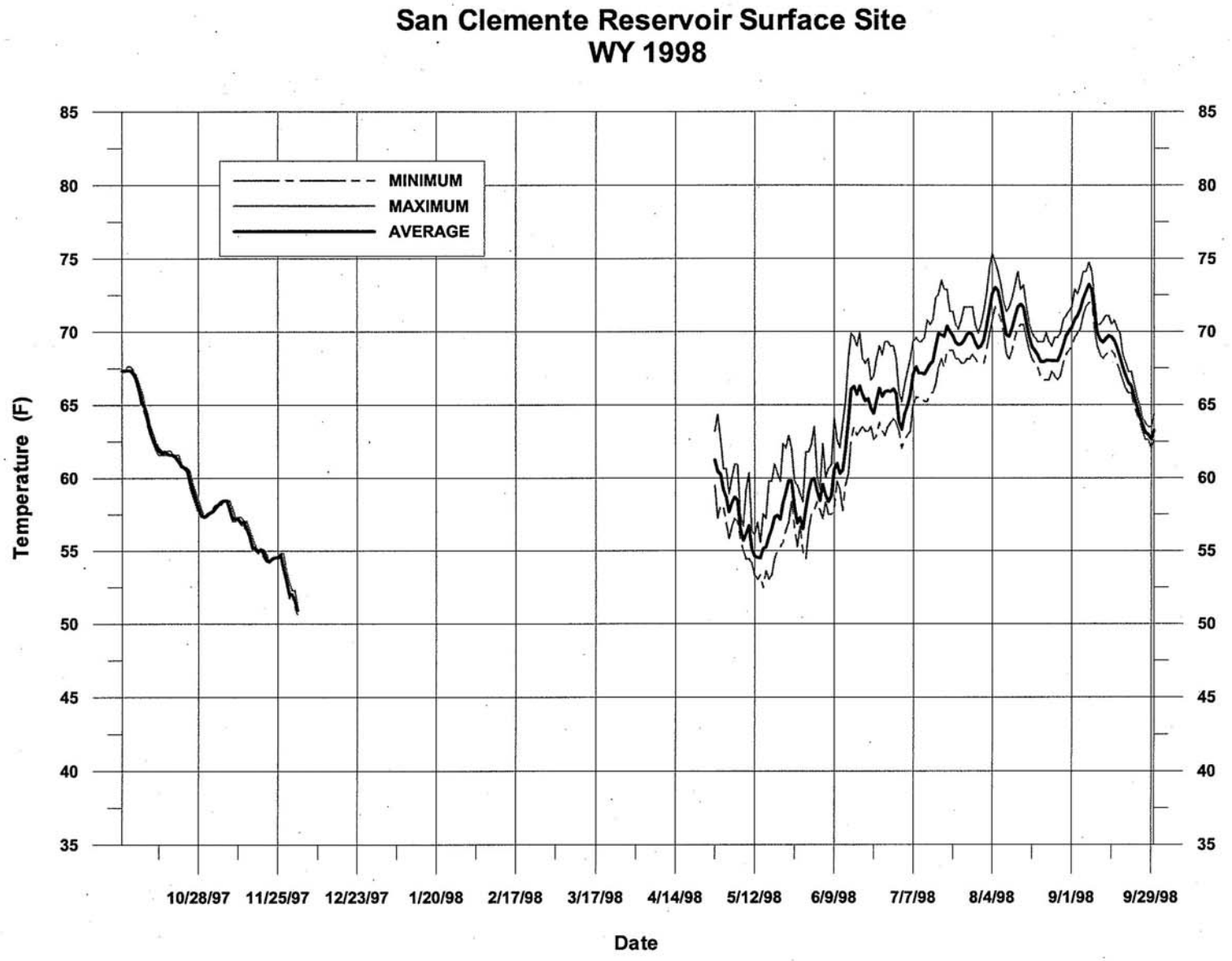
Appendix Q-5. Reservoir Fixed Station Water Quality Summary - Summer 2004 Drawdown
Daily Minimum, Maximum, and Mean Values of Temperature, Dissolved Oxygen, and Turbidity

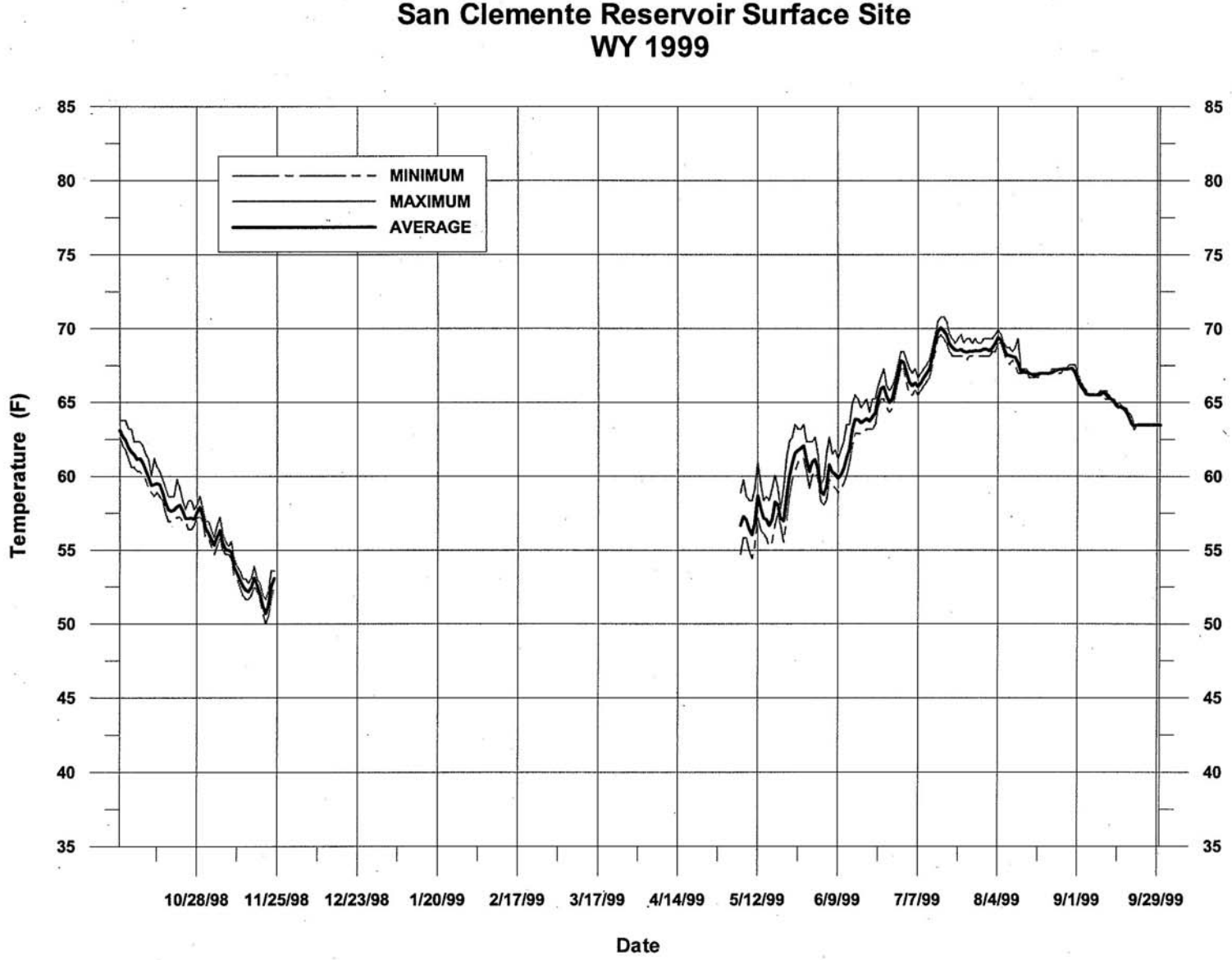
	Temperature (C)			Dissolved Oxygen (mg/L)			Turbidity (NTU)		
Date	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
5-May	15.78	16.74	16.16	7.11	8.25	7.69	0	0	0
6-May	15.63	16.57	15.99	7.16	8.27	7.66	0	2	0
7-May	15.58	16.31	15.90	7.11	8.28	7.62	0	0	0
8-May	15.92	16.82	16.25	7.30	8.18	7.65	0	0	0
9-May	15.79	16.74	16.11	7.05	8.34	7.55	0	0	0
10-May	15.75	17.08	16.28	7.15	8.22	7.70	0	0	0
11-May	15.87	16.84	16.27	7.34	8.70	7.84	0	0	0
12-May	15.42	17.07	16.16	6.92	8.28	7.60	0	3	0
13-May	15.40	17.18	16.22	7.13	8.16	7.64	0	1	0
14-May	15.74	17.38	16.48	7.41	8.11	7.66	0	0	0
15-May	16.11	17.56	16.74	6.85	7.91	7.31	0	1	0
16-May	15.96	17.20	16.71	6.16	7.52	6.72	0	3	0
17-May	16.23	17.45	16.80	6.33	7.09	6.73	0	1	0
18-May	16.05	17.47	16.87	6.11	6.96	6.61	0	6	2
19-May	15.95	17.45	16.78	6.18	6.95	6.68	0	6	3
20-May	16.43	17.39	16.93	6.36	6.93	6.66	1	4	2
21-May	16.51	17.71	17.02	6.28	6.76	6.52	2	7	4
22-May	16.57	18.00	17.21	6.18	6.76	6.54	3	8	6
23-May	16.73	17.81	17.17	6.03	6.80	6.33	6	9	8
24-May	16.79	18.09	17.23	6.00	6.66	6.17	-	-	-
25-May	16.88	17.44	17.45	6.15	7.06	6.90	2	3	2
26-May	16.92	18.86	17.73	6.00	6.66	6.25	2	4	3
27-May	17.36	19.30	18.19	5.69	6.45	6.03	2	4	3
28-May	17.85	19.14	18.28	4.84	5.89	5.46	4	8	5
29-May	17.30	18.85	18.03	4.69	5.92	5.11	6	8	7
30-May	17.00	18.96	18.00	5.10	6.21	5.66	8	10	9
31-May	17.42	19.49	18.32	5.05	6.17	5.48	8	11	9
1-Jun	17.46	19.04	18.33	5.04	5.84	5.31	10	14	12
2-Jun	17.61	19.46	18.50	4.84	5.44	5.20	11	14	12
3-Jun	18.10	19.79	18.84	4.77	5.85	5.51	8	13	12
4-Jun	18.08	20.16	18.97	4.21	5.94	5.03	8	11	10
5-Jun	18.13	20.69	19.17	4.39	5.91	5.03	9	13	10
6-Jun	18.40	20.78	19.40	4.36	5.96	5.09	12	16	14
7-Jun	18.64	20.28	19.36	4.77	6.26	5.50	11	18	16
8-Jun	18.37	19.56	18.79	4.71	6.39	5.24	11	13	12
9-Jun	17.88	19.58	18.63	5.18	6.03	5.49	12	16	14

Appendix Q-6

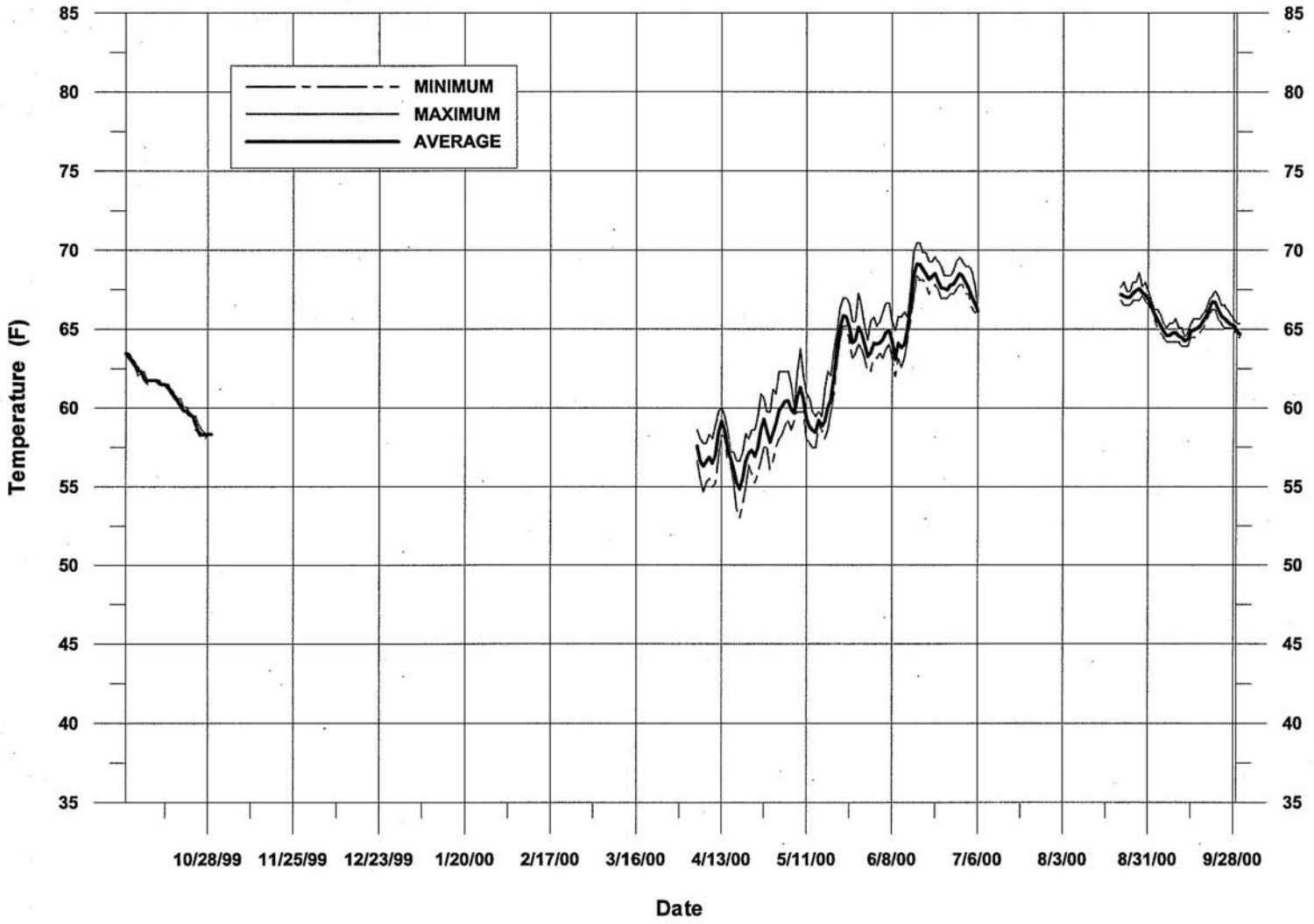
MPWMD Temperature Data Graphs for Surface of San Clemente Reservoir, 1997-2003


San Clemente Reservoir Surface Site
WY 1997
MINIMUM
MAXIMUM
AVERAGE
Temperature (F)
85
80
75
70
65
60
55
50
45
40
35
10/28/96
11/25/96
12/23/96
1/20/97
2/17/97
3/17/97
4/14/97
5/12/97
6/9/97
7/7/97
8/4/97
9/1/97
9/29/97
Date

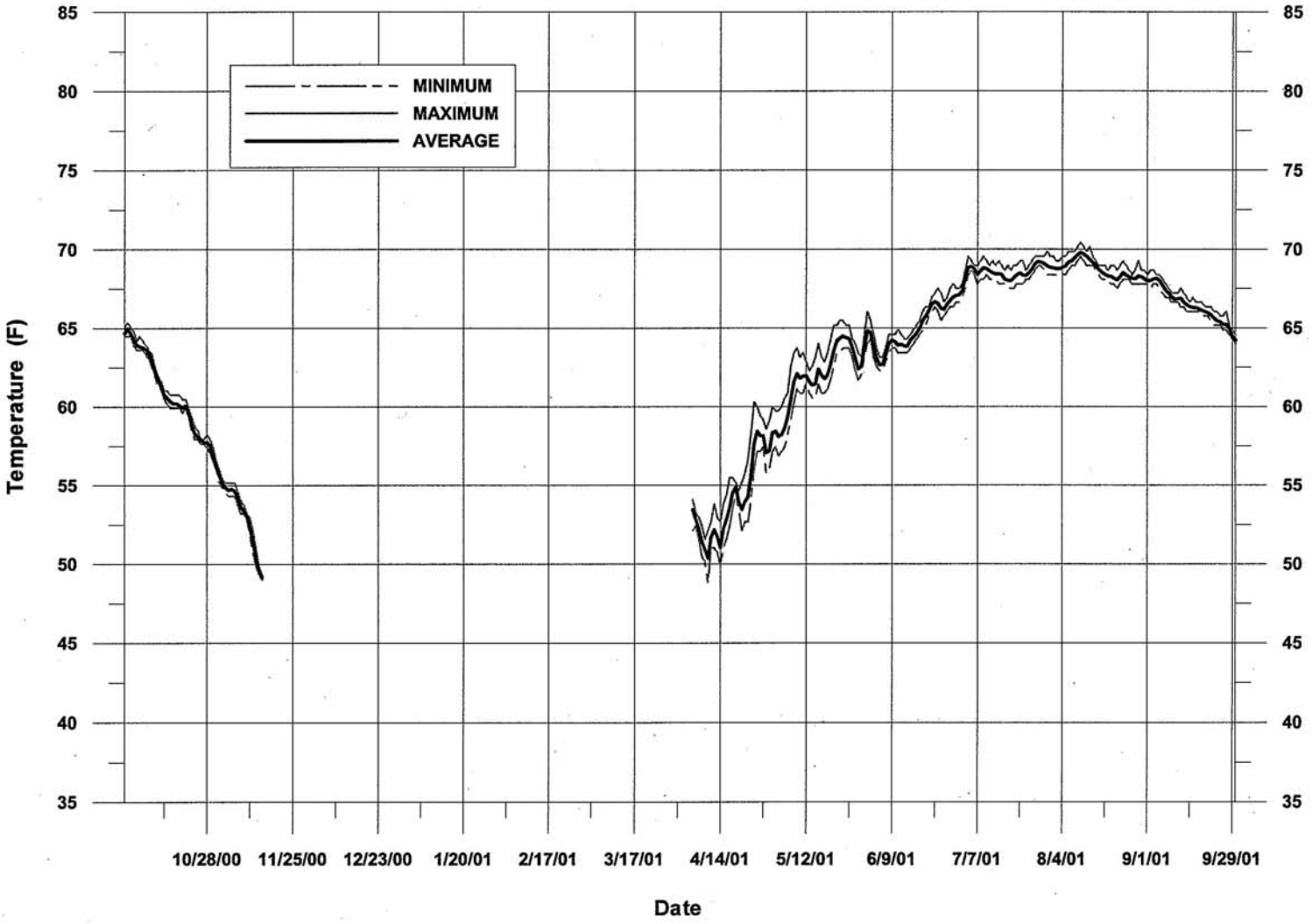

San Clemente Reservoir Surface Site
WY 1998
MINIMUM
MAXIMUM
AVERAGE
Temperature (F)
85
80
75
70
65
60
55
50
45
40
35
10/28/97
11/25/97
12/23/97
1/20/98
2/17/98
3/17/98
4/14/98
5/12/98
6/9/98
7/7/98
8/4/98
9/1/98
9/29/98
Date


San Clemente Reservoir Surface Site
WY 1999
MINIMUM
MAXIMUM
AVERAGE
Temperature (F)
85
80
75
70
65
60
55
50
45
40
35
10/28/98
11/25/98
12/23/98
1/20/99
2/17/99
3/17/99
4/14/99
5/12/99
6/9/99
7/7/99
8/4/99
9/1/99
9/29/99
Date

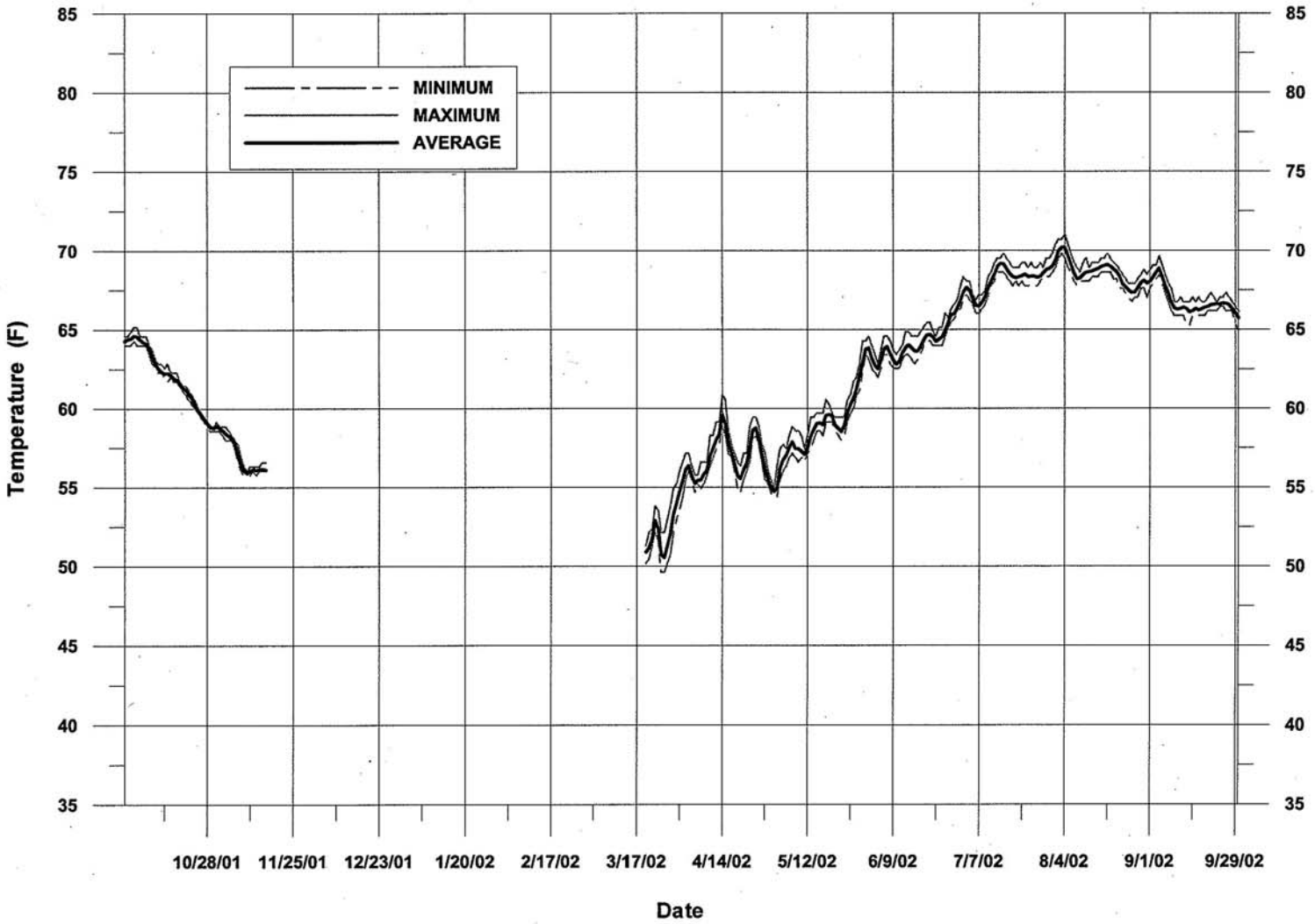
San Clemente Reservoir Surface Site
WY 2000

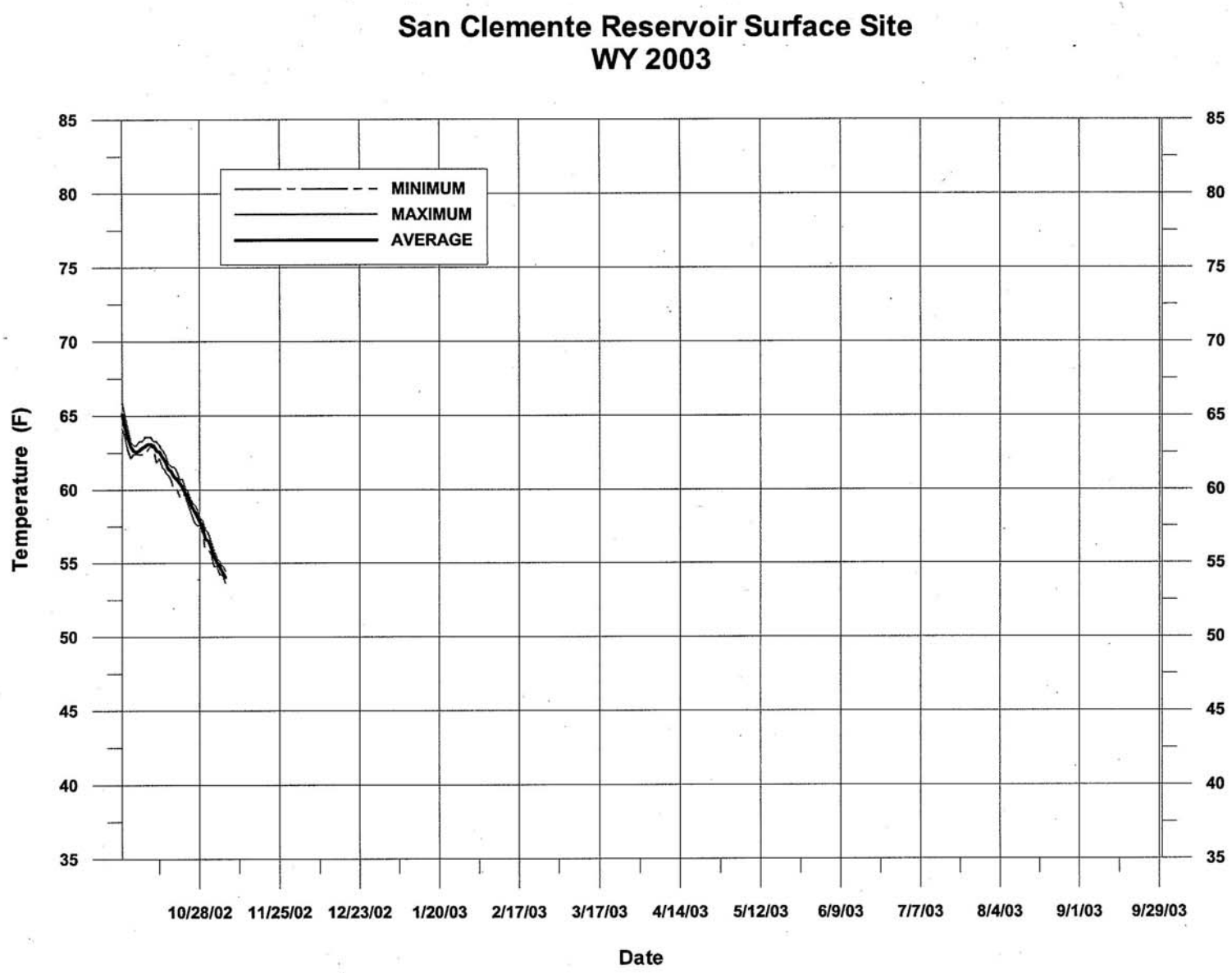


San Clemente Reservoir Surface Site
WY 2001



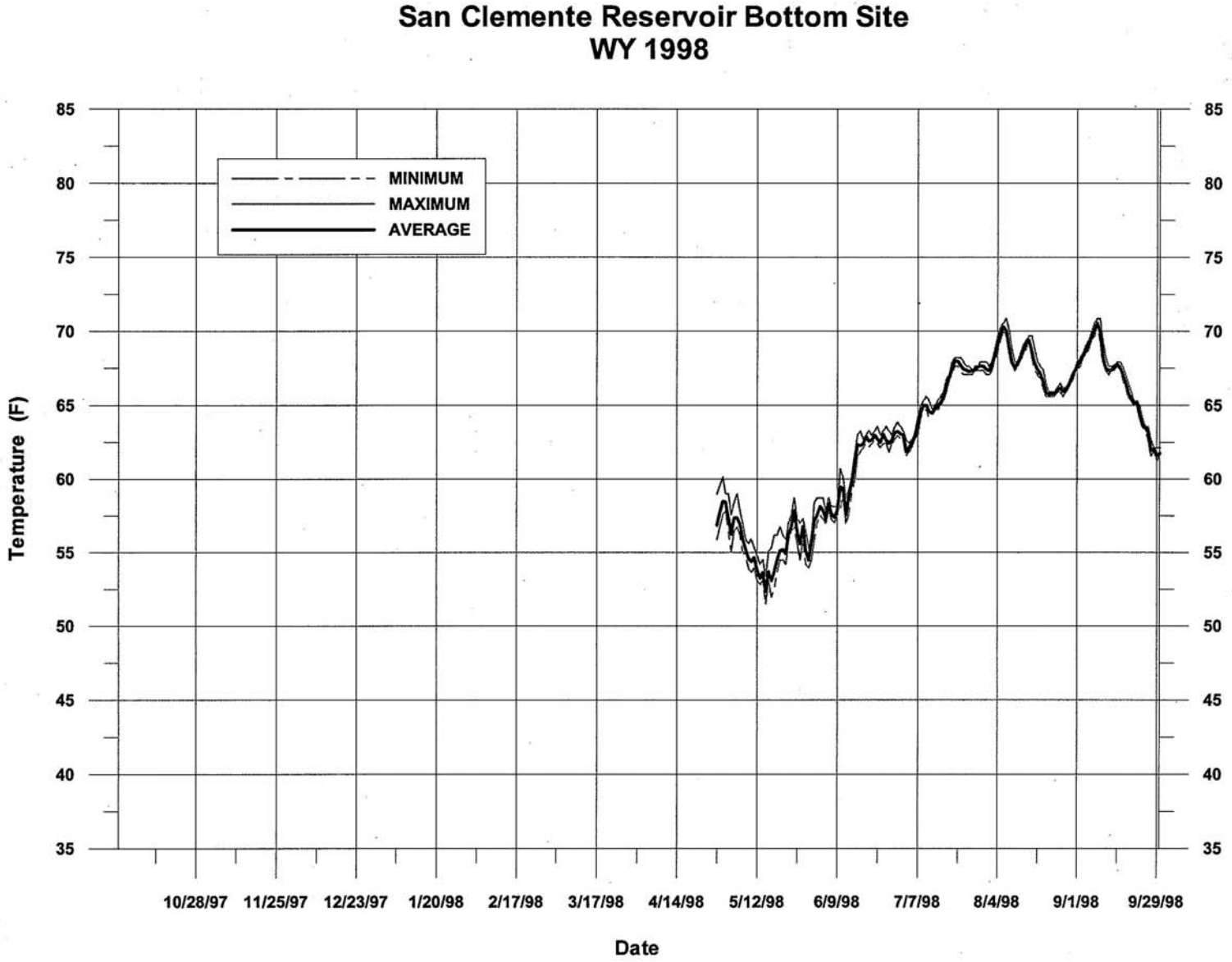
San Clemente Reservoir Surface Site
WY 2002



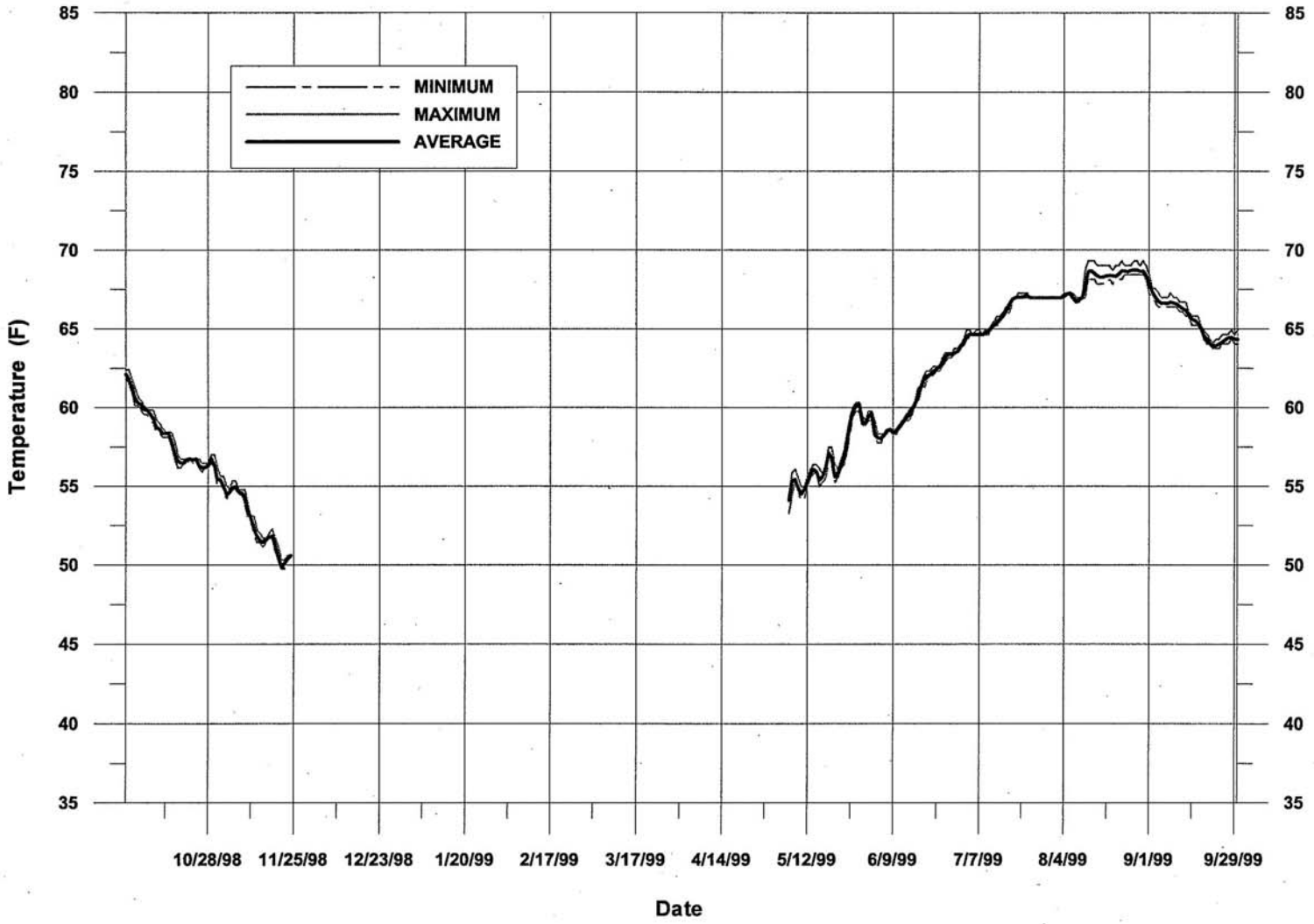

San Clemente Reservoir Surface Site
WY 2003
MINIMUM
MAXIMUM
AVERAGE
Temperature (F)
85
80
75
70
65
60
55
50
45
40
35
10/28/02
11/25/02
12/23/02
1/20/03
2/17/03
3/17/03
4/14/03
5/12/03
6/9/03
7/7/03
8/4/03
9/1/03
9/29/03
Date

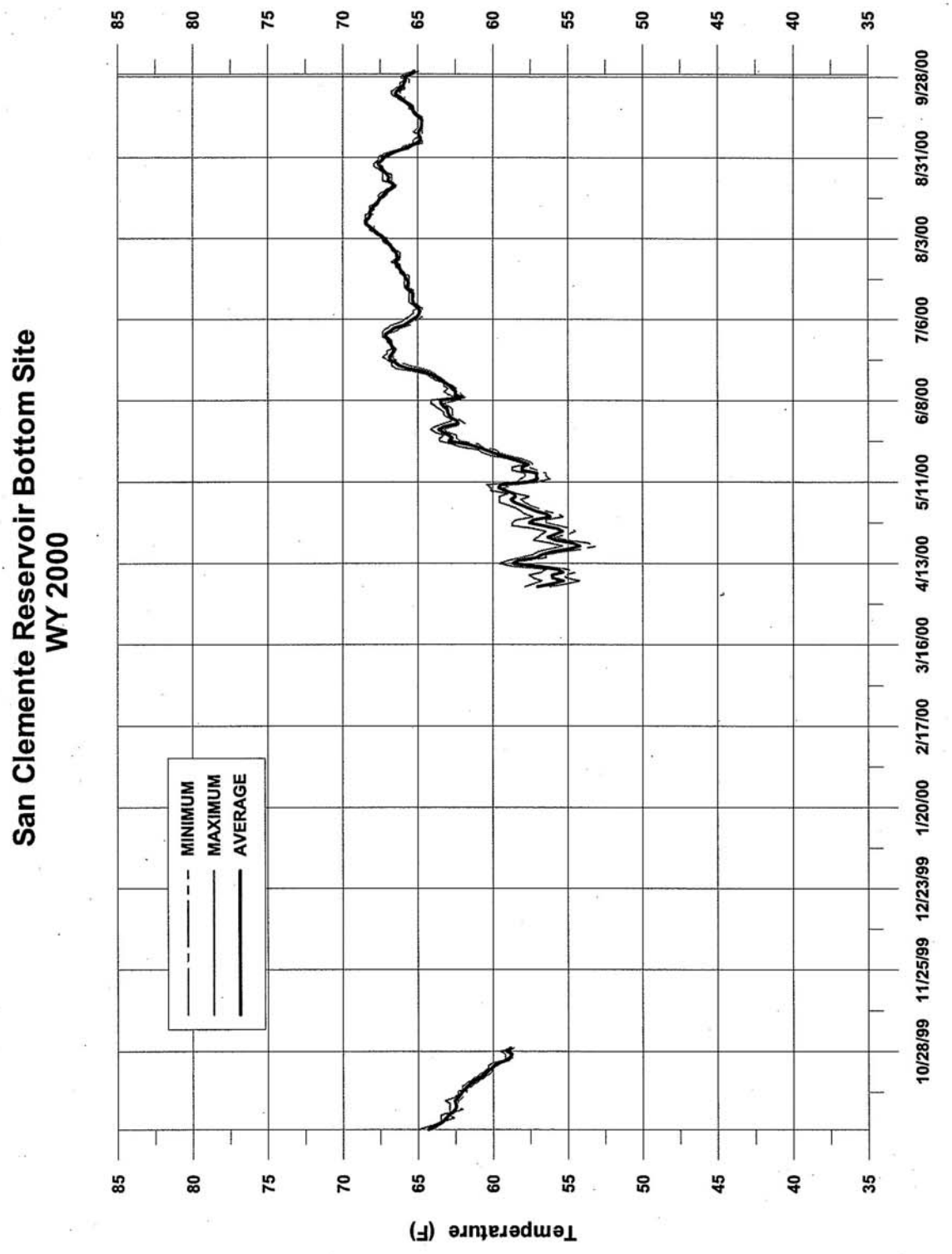
Appendix Q-7

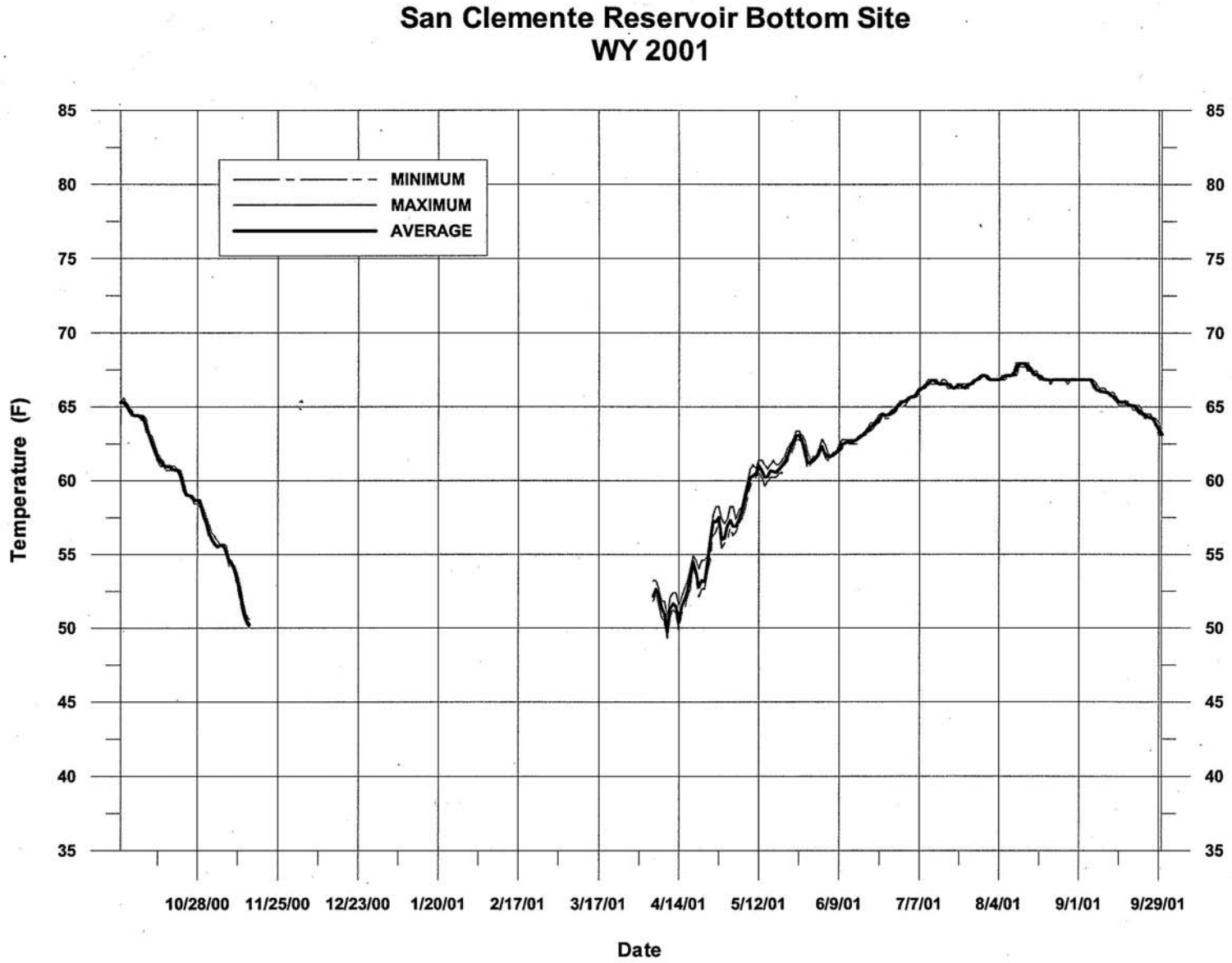
MPWMD Temperature Data Graphs for Bottom of San Clemente Reservoir, 1998-2003

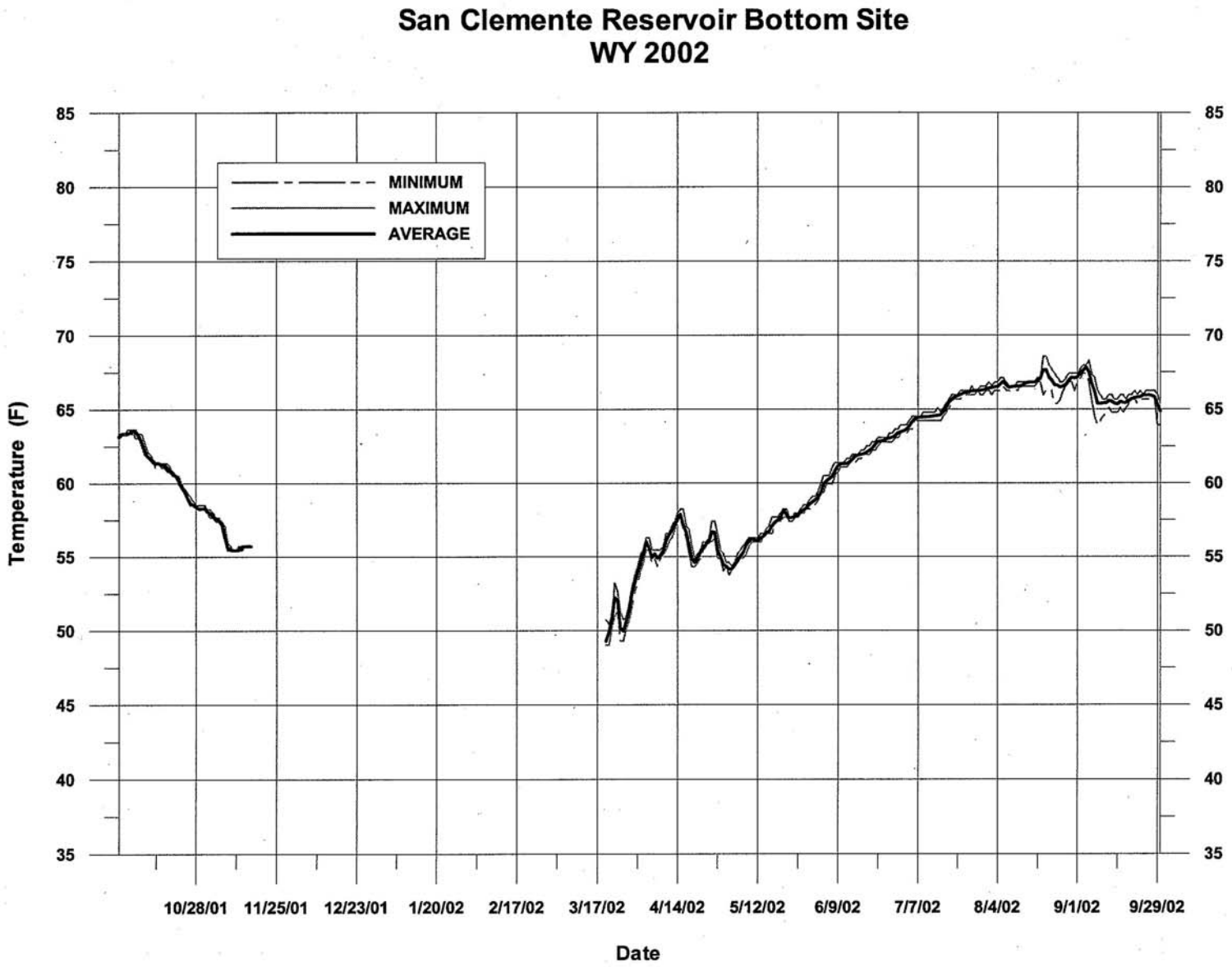

San Clemente Reservoir Bottom Site
WY 1998
MINIMUM
MAXIMUM
AVERAGE
Temperature (F)
85
80
75
70
65
60
55
50
45
40
35
10/28/97
11/25/97
12/23/97
1/20/98
2/17/98
3/17/98
4/14/98
5/12/98
6/9/98
7/7/98
8/4/98
9/1/98
9/29/98
Date

San Clemente Reservoir Bottom Site
WY 1999

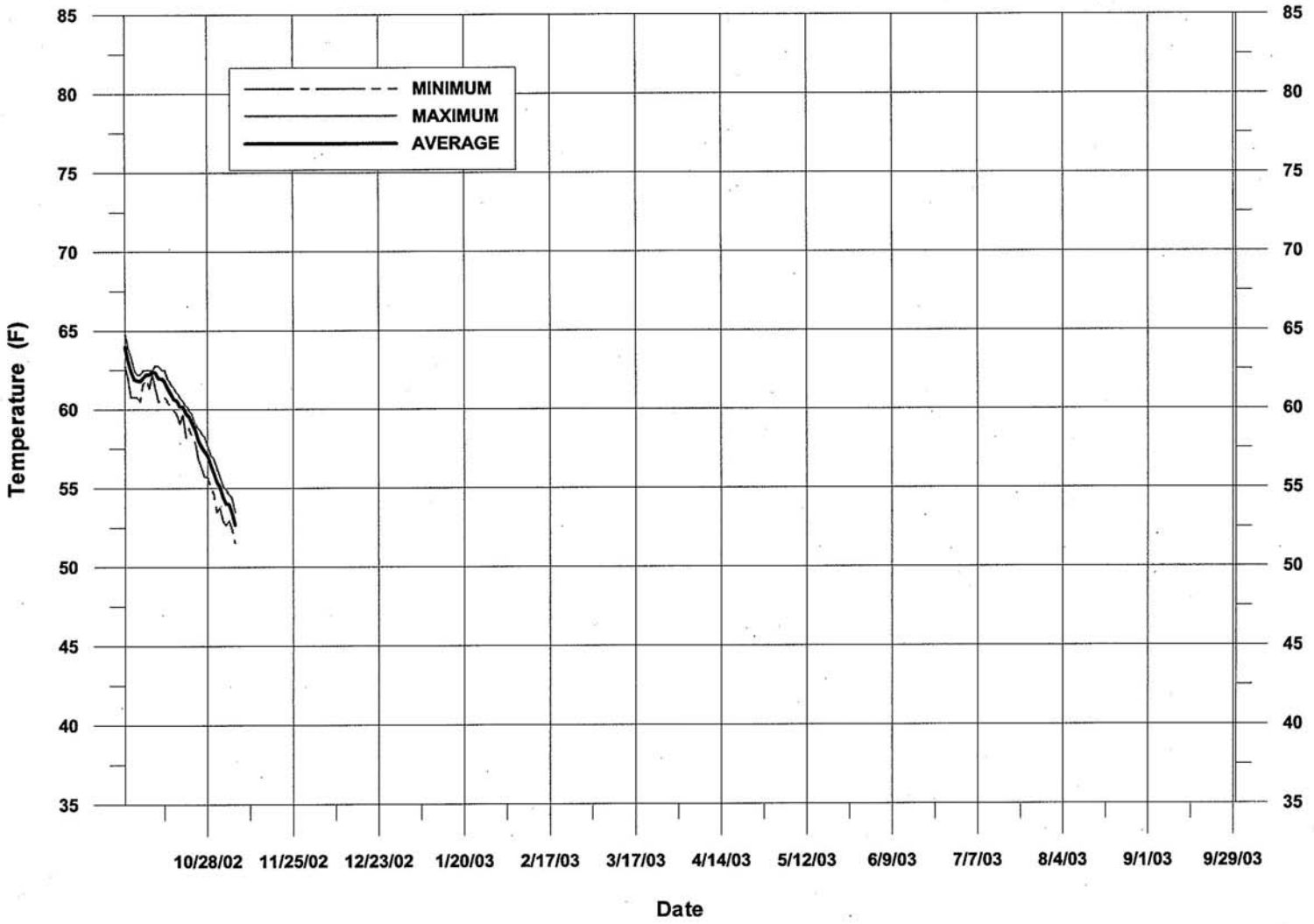



San Clemente Reservoir Bottom Site
WY 2000
MINIMUM
MAXIMUM
AVERAGE
Temperature (F)
85
80
75
70
65
60
55
50
45
40
35
10/28/99
11/25/99
12/23/99
1/20/00
2/17/00
3/16/00
4/13/00
5/11/00
6/8/00
7/6/00
8/3/00
8/31/00
9/28/00
Date


San Clemente Reservoir Bottom Site
WY 2001
MINIMUM
MAXIMUM
AVERAGE
Temperature (F)
85
80
75
70
65
60
55
50
45
40
35
10/28/00
11/25/00
12/23/00
1/20/01
2/17/01
3/17/01
4/14/01
5/12/01
6/9/01
7/7/01
8/4/01
9/1/01
9/29/01
Date


San Clemente Reservoir Bottom Site
WY 2002
MINIMUM
MAXIMUM
AVERAGE
Temperature (F)
85
80
75
70
65
60
55
50
45
40
35
10/28/01
11/25/01
12/23/01
1/20/02
2/17/02
3/17/02
4/14/02
5/12/02
6/9/02
7/7/02
8/4/02
9/1/02
9/29/02
Date

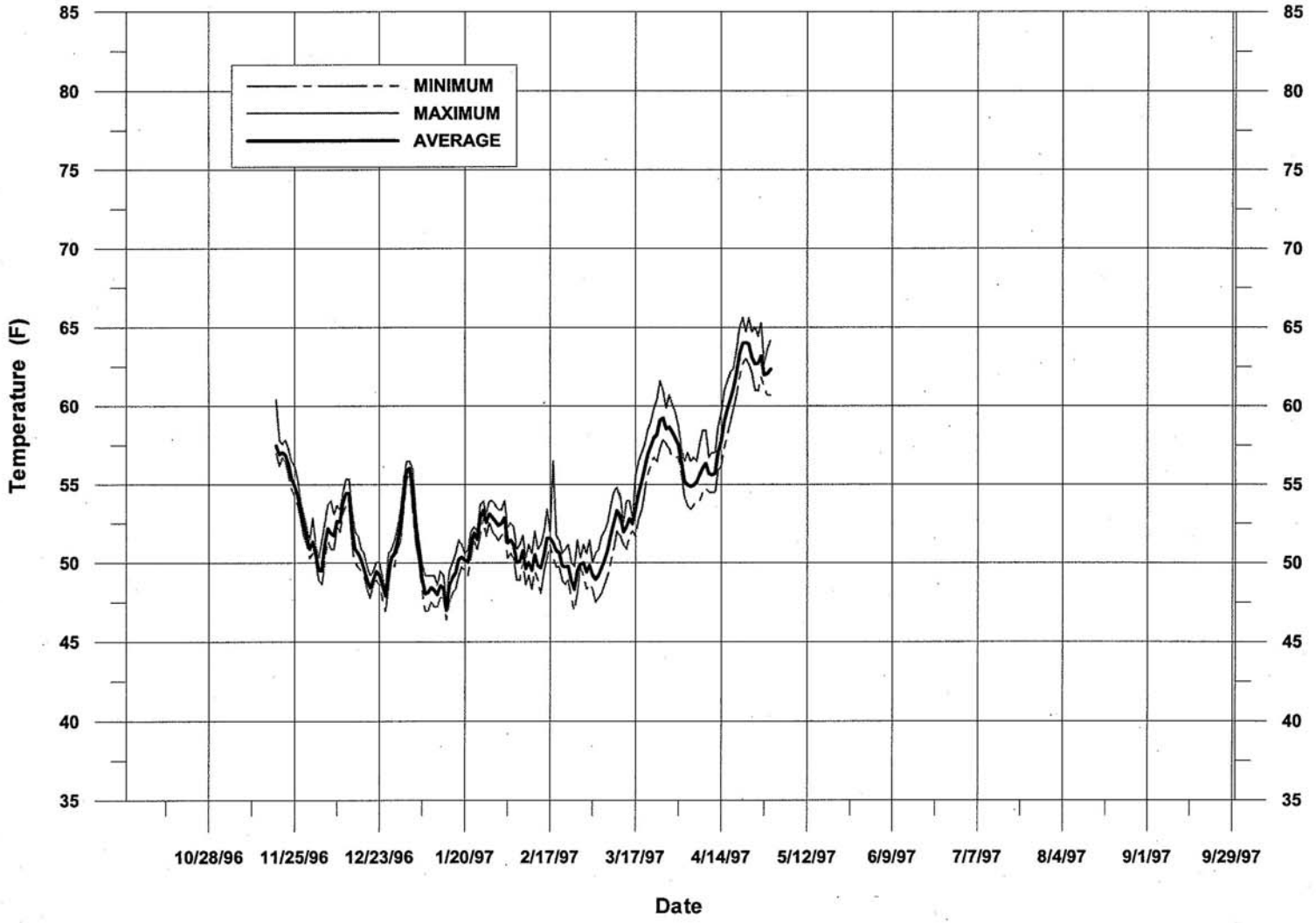
San Clemente Reservoir Bottom Site
WY 2003



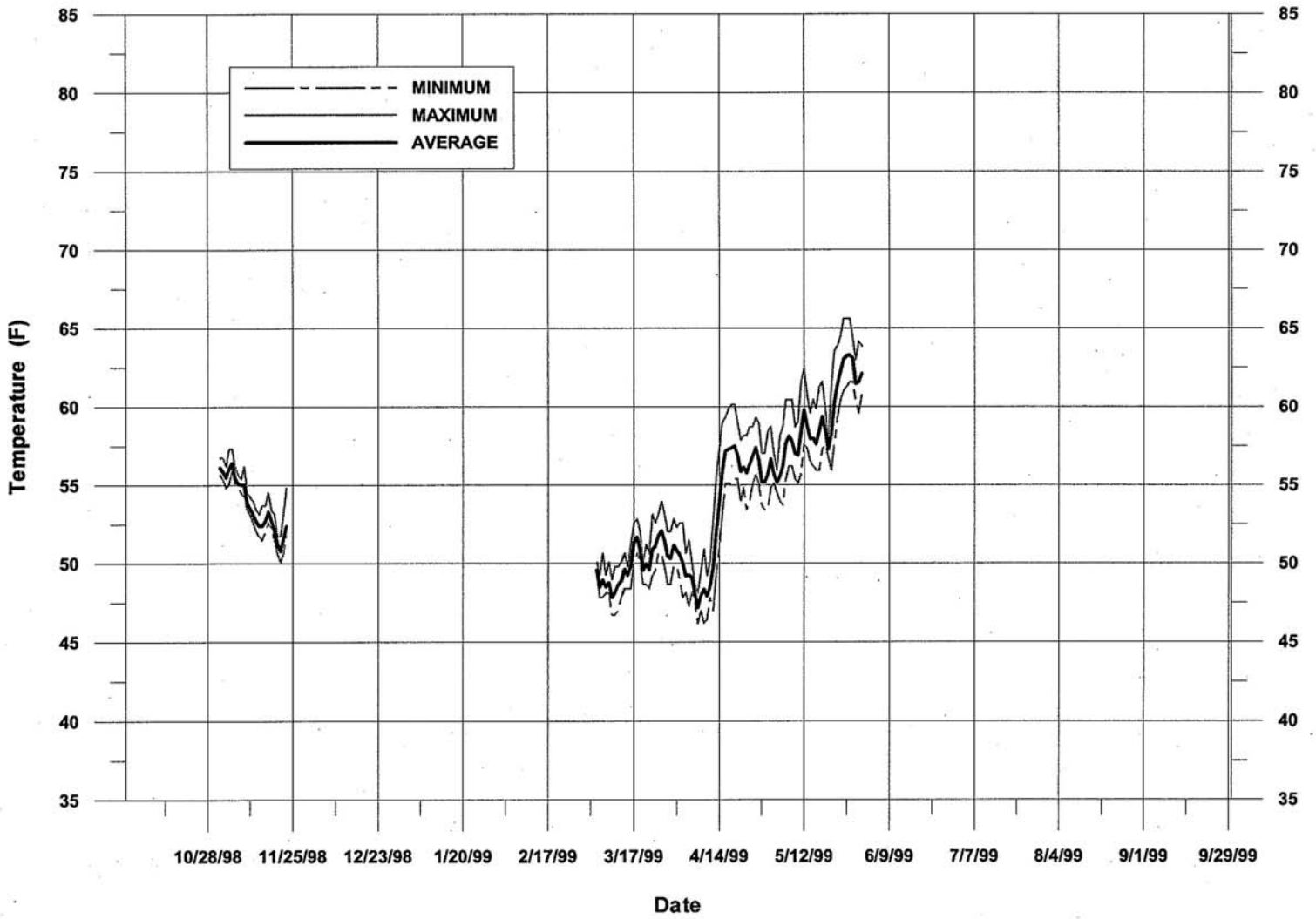
Appendix Q-8

MPWMD Temperature Data Graphs for Fish ladder, 1997-2003

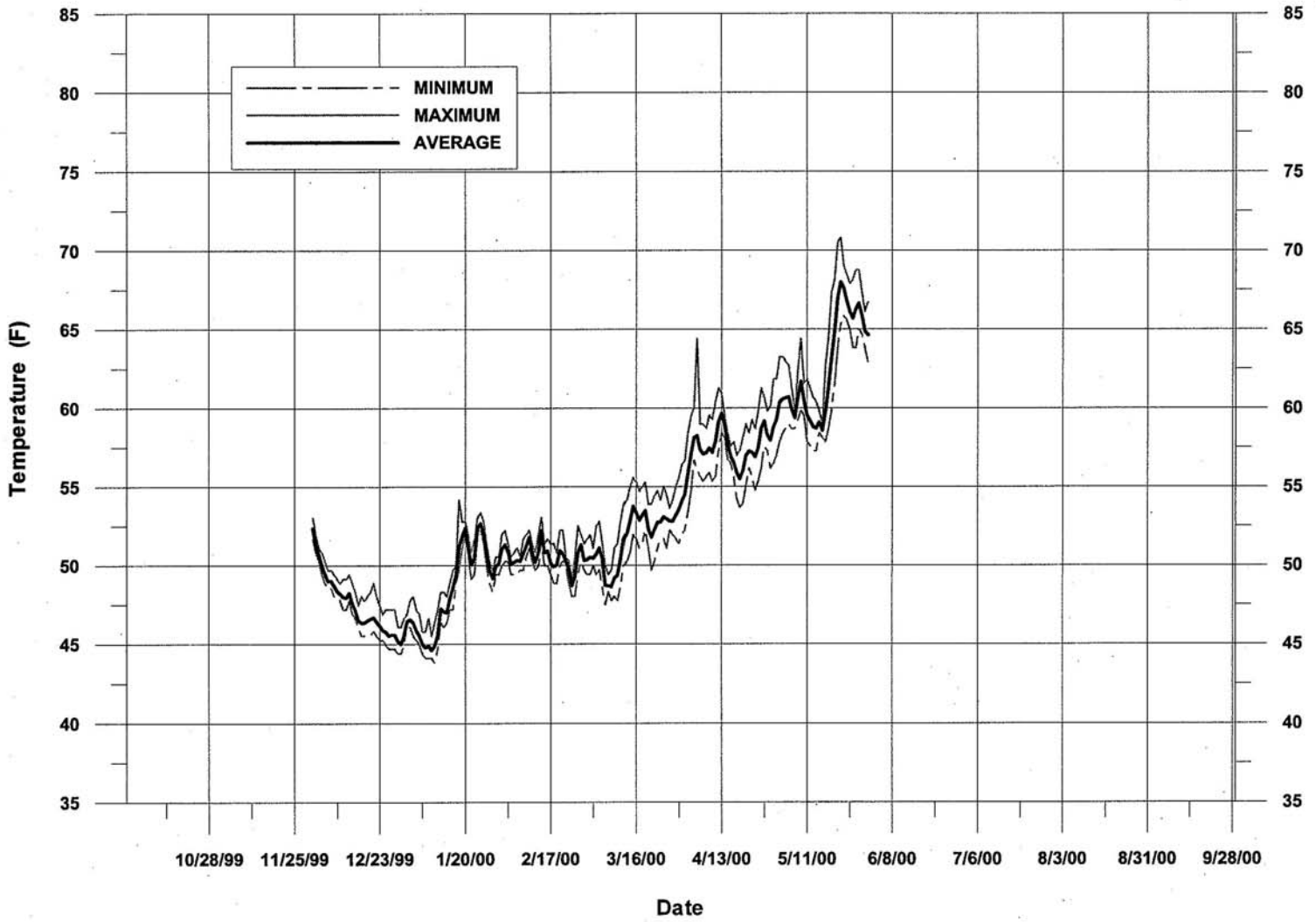
Carmel River Water Temperature at San Clemente Fish Ladder Site
WY 1997

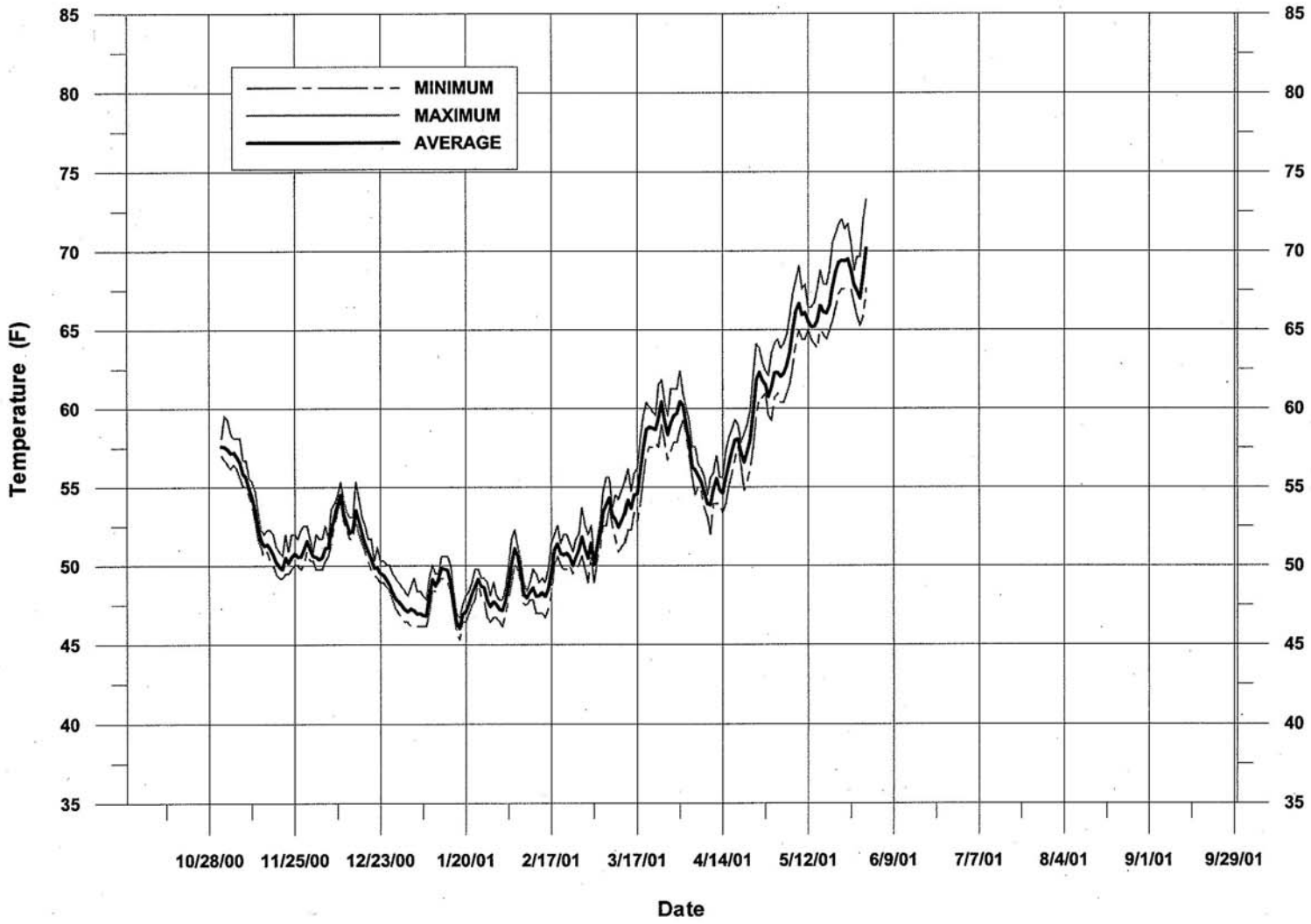


Carmel River Water Temperature at San Clemente Fish Ladder Site
WY 1999

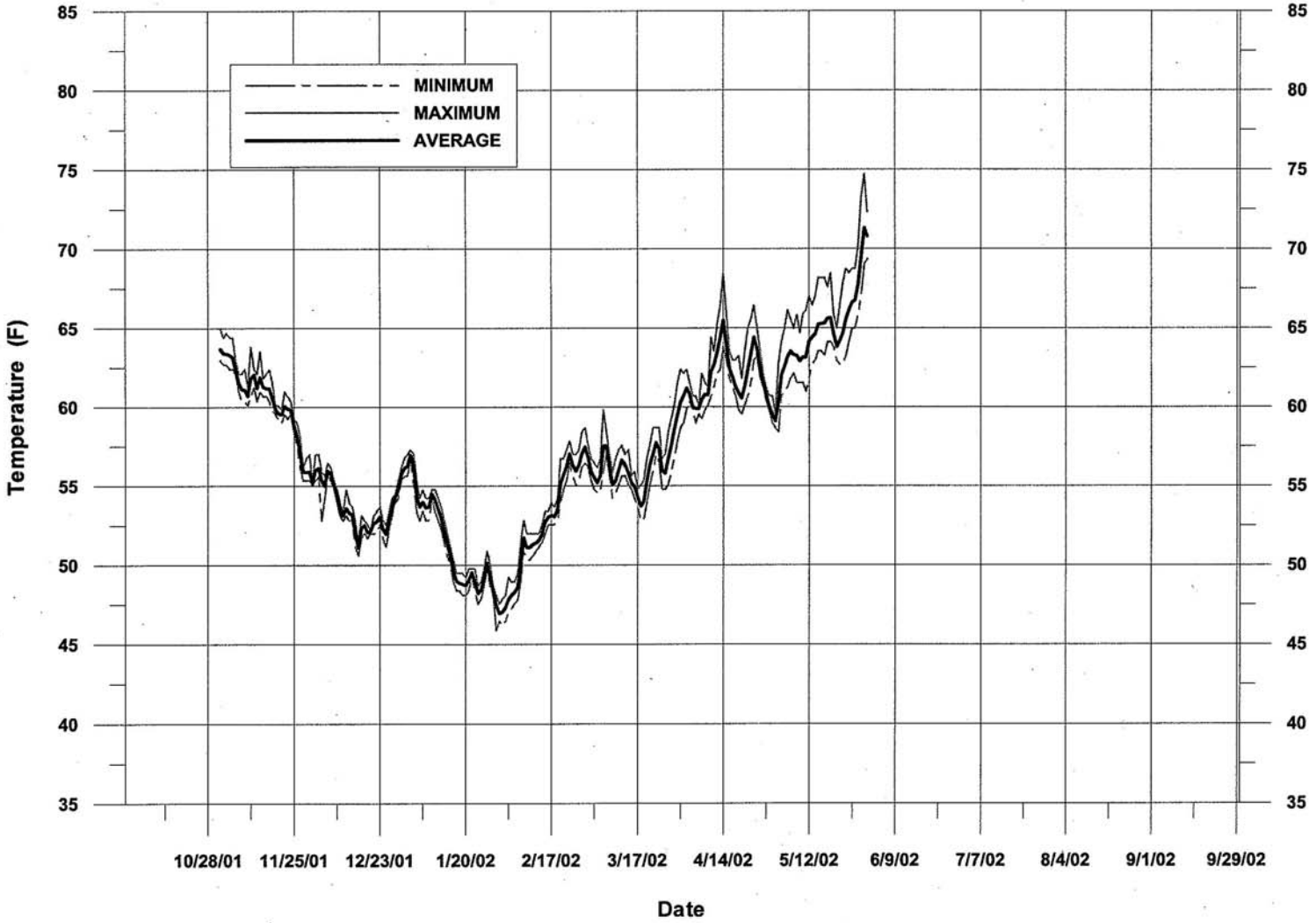


Carmel River Water Temperature at San Clemente Fish Ladder Site
WY 2000

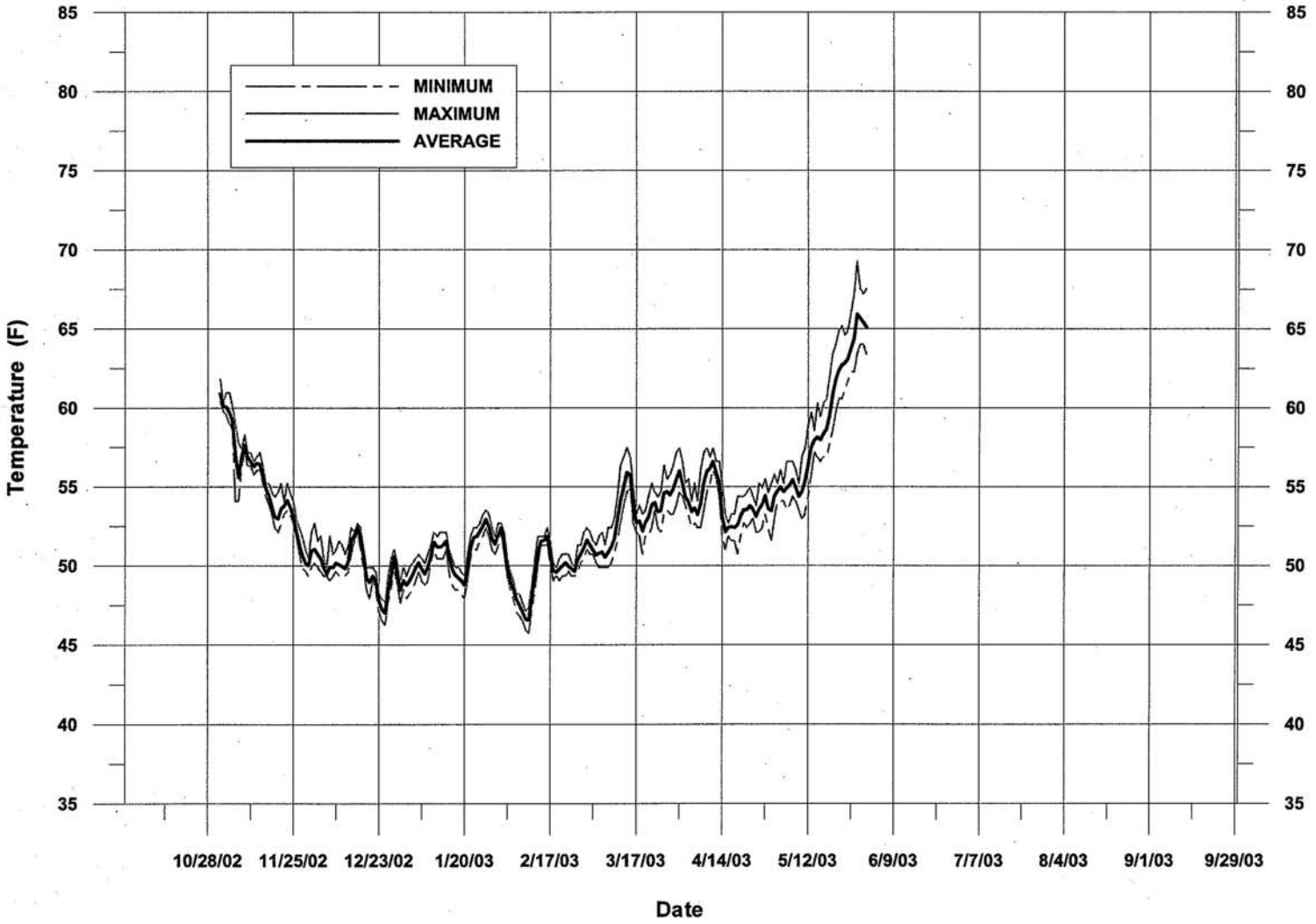



Carmel River Water Temperature at San Clemente Fish Ladder Site
WY 2001
MINIMUM
MAXIMUM
AVERAGE
Temperature (F)
85
80
75
70
65
60
55
50
45
40
35
10/28/00
11/25/00
12/23/00
1/20/01
2/17/01
3/17/01
4/14/01
5/12/01
6/9/01
7/7/01
8/4/01
9/1/01
9/29/01
Date

Carmel River Water Temperature at San Clemente Fish Ladder Site
WY 2002



Carmel River Water Temperature at San Clemente Fish Ladder Site
WY 2003



Appendix Q-9. Daily Average Temperature, Dissolved Oxygen and Turbidity, 2003 and 2004 Drawdowns. First Riffle Below San Clemente Dam in the Carmel River.

2003 Daily Average Water Quality, First Riffle

	Temp (C)	DO (mg/L)	Turbidity (NTU)
16-Jun	19.11	9.00	1.3
17-Jun	18.17	8.97	1.9
18-Jun	17.71	8.95	2.1
19-Jun	17.22	9.00	2.4
20-Jun	16.65	9.25	2.6
21-Jun	17.18	9.26	2.2
22-Jun	16.03	9.00	2.8
23-Jun	16.40	9.37	3.6
24-Jun	16.72	9.31	4.7
25-Jun	17.72	9.01	9.6
26-Jun	18.72	8.70	17.4
27-Jun	19.53	8.50	14.5
28-Jun	19.84	8.56	14.4
29-Jun	19.71	8.62	12.8
30-Jun	19.37	8.68	13.5
1-Jul	19.17	8.78	14.1
2-Jul	18.91	8.85	14.8
3-Jul	18.75	9.00	11.8
4-Jul	18.89	9.05	10.7
5-Jul	19.09	9.06	10.9
6-Jul	18.99	9.10	11.1
7-Jul	19.02	9.27	10.7
8-Jul	18.82	9.42	11.8
9-Jul	18.95	9.11	12.5
10-Jul	19.28	8.90	11.9
11-Jul	19.34	8.86	10.2
12-Jul	19.51	8.83	9.6
13-Jul	19.39	8.91	9.9
14-Jul	19.44	9.39	9.4
15-Jul	19.45	9.33	9.7
16-Jul	19.31	9.32	9.6
17-Jul	19.57	9.34	10.4
18-Jul	19.91	9.23	13.2
19-Jul	19.78	9.06	16.4
20-Jul	19.37	9.19	23.4
21-Jul	20.03	9.13	26.2
22-Jul	20.43	8.85	24.3
23-Jul	20.32	8.89	21.4
24-Jul	20.19	9.05	19.3
25-Jul	20.38	9.04	17.3
26-Jul	20.39	8.99	15.8
27-Jul	20.81	8.98	15.0
28-Jul	20.96	8.8	15.2
29-Jul	20.78	8.83	15.7
30-Jul	20.59	9.05	16.0
31-Jul	20.33	9.05	15.8

2004 Daily Average Water Quality, First Riffle

	Temp (C)	DO (mg/L)	Turbidity (NTU)
6-May	16.0	9.5	1.6
7-May	15.7	9.6	0.9
8-May	16.3	9.6	1.7
9-May	15.7	9.4	0.8
10-May	16.2	9.5	0.5
11-May	16.3	9.6	1.3
12-May	16.0	9.6	1.0
13-May	16.1	9.6	1.3
14-May	16.3	9.5	1.9
15-May	16.5	9.5	1.6
16-May	16.3	9.5	2.8
17-May	16.5	9.4	1.9
18-May	16.5	9.4	2.3
19-May	16.3	9.4	2.2
20-May	16.6	9.3	2.0
21-May	16.6	9.6	2.4
22-May	17.0	9.2	2.5
23-May	16.8	9.3	3.5
24-May	17.0	8.9	4.1
25-May	17.1	8.9	4.5
26-May	17.4	8.8	5.8
27-May	17.9	8.9	6.4
28-May	18.0	9.0	7.5
29-May	17.6	8.9	9.6
30-May	17.5	9.0	10.6
31-May	17.8	8.9	11.8
1-Jun	17.8	8.9	11.7
2-Jun	18.2	8.9	11.8
3-Jun	18.4	8.8	12.1
4-Jun	18.4	8.6	11.6
5-Jun	18.6	8.5	11.3
6-Jun	18.7	8.6	11.3
7-Jun	18.9	8.5	11.4
8-Jun	18.3	8.7	12.3
9-Jun	18.2	8.9	11.6
10-Jun	18.6	8.7	12.0

Appendix Q-10. 2004 Temperature, Dissolved Oxygen and Turbidity Values Collected near Old Carmel River Dam Bridge (OCRD) and Sleepy Hollow Ford During Drawdown Period

	OCRD			Sleepy Hollow Ford		
	Temperature (C)	DO (mg/L)	Turbidity (NTU)	Temperature (C)	DO (mg/L)	Turbidity (NTU)
11-May	16.1	9.2	0.5	15.7	9.3	1.1
12-May	16.2	9.5	0.6	16.9	9.3	1.2
17-May	16.4	9.1	2.2	17.0	9.0	1.7
20-May	16.3	9.3	2.5	16.1	9.3	2.6
23-May	16.5	8.9	3.3	16.3	9.1	2.7
26-May	18.2	8.7	4.1	19.1	8.9	3.2
29-May	16.8	8.8	8.5	16.6	9.0	6.1
1-Jun	18.6	8.7	8.6	19.6	9.0	4.5
5-Jun	17.2	8.4	9.9	16.4	8.5	6.5
7-Jun	19.5	8.3	9.2	20.4	8.9	6.0
10-Jun	17.8	8.6	11.9	17.4	8.6	8.6

Appendix Q-11

MPWMD Water Quality Data Summary Tables at SHW, 1991-2003

Table 7. Sleepy Hollow Weir Water Quality Data For WY 1992.

Date	Time	Temperature (F)	Dissolved Oxygen (mg/L)	Carbon Dioxide (mg/L)	pH	Specific Conductance (umhos)	Color	Odor	Turbidity
21-Nov-91		54.0	9	10.0	7.5	350	clear	none	none
20-Dec-91		45.0	11	10.0	7.8	NA	clear	none	none
02-Jan-92		45.5	11	5.0	7.8	NA	yllw/brn	earthy	none
14-Jan-92		43.5	12	7.5	7.5	260	clear	none	none
30-Jan-92		46.5	12	10.0	7.8	NA	clear	none	none
19-Feb-92		50.0	11	5.0	7.5	NA	clear	none	none
02-Mar-92		51.5	10	10.0	7.5	NA	clear	none	none
17-Mar-92		50.5	11	7.8	7.5	220	clear	none	none
01-Apr-92		56.5	10	7.5	7.8	245	clear	none	slight
15-May-92		68.0	9	5.0	7.8	265	clear	none	none
11-Jun-92		68.0	10	5.0	7.8	265	clear	none	none
01-Jul-92		67.0	8	5.0	7.8	285	clear	sl.oranic	slight
13-Jul-92		70.5	9	10.0	7.8	285	clear	none	none
03-Aug-92		69.5	9	5.0	7.8	300	clear	none	none
14-Aug-92		68.5	8	7.5	7.5	305	clear	sl.earthy	slight
02-Sep-92		67.5	8	7.5	7.5	330	clear	none	slight
17-Sep-92		65.5	9	10.0	7.8	335	clear	none	slight
Minimum		43.5	8	5.0	7.5	220	NA	NA	NA
Maximum		70.5	12	10.0	7.8	350	NA	NA	NA
Mean		58.1	9.8	7.5	7.6	287.1	NA	NA	NA

Table 8. Sleepy Hollow Weir Water Quality Data For WY 1993.

Date	Time	Temperature (F)	Dissolved Oxygen (mg/L)	Carbon Dioxide (mg/L)	pH	Specific Conductance (umhos)	Color	Odor	Turbidity
01-Oct-92		64.5	9	10.0	7.5	340	clear	none	slight
30-Oct-92		61.0	8	10.0	7.5	350	clear	none	slight
16-Nov-92		53.0	9	5.0	7.8	345	clear	none	slight
02-Dec-92		48.0	11	5.0	7.8	350	clear	none	slight
15-Dec-92		48.0	11	10.0	7.5	325	clear	none	none
28-Dec-92		45.5	11	7.5	7.5	310	clear	none	none
19-Jan-93		50.0	12	5.0	7.5	165	brownish	none	moder.
02-Feb-93		45.5	11	6.0	7.5	195	clear	none	none
16-Feb-93		47.5	11	5.0	7.8	215	clear	none	none
03-Mar-93		49.5	10	5.0	7.5	200	clear	sl.earthy	moder.
15-Mar-93		53.5	10	5.0	7.8	235	clear	none	none
30-Mar-93		52.0	10	5.0	7.8	235	clear	none	moderate
15-Apr-93		49.0	11	7.5	7.5	250	clear	none	none
30-Apr-93		59.0	10	5.0	7.5	260	clear	none	none
17-May-93		61.0	11	10.0	7.8	275	clear	none	none
01-Jun-93		65.0	10	5.0	7.8	280	clear	none	none
24-Jun-93		68.0	8	5.0	8.0	295	clear	none	none
08-Jul-93		69.0	8	5.0	8.0	290	clear	none	none
28-Jul-93		67.0	9	5.0	8.0	NA	clear	none	none
17-Aug-93		69.0	10	10.0	8.0	320	clear	none	slight
31-Aug-93		67.5	9	10.0	7.5	305	clear	none	none
23-Sep-93		62.5	9	10.0	8.0	315	clear	none	none
Minimum		45.5	8	5.0	7.5	165			
Maximum		69.0	12	10.0	8.0	350			
Mean		57.0	9.9	6.9	7.69	278.8			

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Table 9. Sleepy Hollow Weir Water Quality Data For WY 1994.

Date	Time	Temperature (F)	Dissolved Oxygen (mg/L)	Carbon Dioxide (mg/L)	pH	Specific Conductance (umhos)	Color	Odor	Turbidity
01-Oct-93		63.0	9	10.0	8.0	350	clear	none	none
15-Oct-93		64.0	10	10.0	8.0	360	clear	none	none
01-Nov-93		57.0	10	10.0	7.8	375	clear	none	none
15-Nov-93		49.0	10	15.0	8.0	355	clear	none	none
01-Dec-93		47.5	10	10.0	7.5	355	clear	none	none
15-Dec-93		48.5	11	10.0	8.0	340	clear	none	none
29-Dec-93		47.0	11	10.0	7.5	365	clear	none	none
17-Jan-94		45.5	11	10.0	7.5	350	clear	none	none
01-Feb-94		47.5	12	10.0	8.0	320	clear	none	none
14-Feb-94		45.5	12	10.0	8.0	300	clear	none	none
01-Mar-94		47.0	11	5.0	8.0	260	clear	none	none
15-Mar-94		56.0	11	5.0	8.0	265	clear	none	none
01-Apr-94		57.0	10	10.0	8.0	310	clear	none	none
21-Apr-94		62.0	10	10.0	8.0	310	clear	none	none
23-May-94		63.0	9	5.0	8.0	300	clear	sweet	none
28-Jun-94		66.0	9	10.0	7.5	330	clear	none	none
13-Jul-94		65.0	9	5.0	8.0	330	clear	none	none
03-Aug-94		63.0	10	5.0	8.0	320	clear	none	none
15-Aug-94		68.0	10	10.0	7.5	310	clear	none	none
02-Sep-94	13:00	63.0	9	5.0	8.0	335	clear	none	none
08-Sep-94	13:30	65.0	8	7.5	8.0	345	clear	none	none
30-Sep-94	11:00	62.0	8	5.0	7.5	340	clear	none	none
Minimum		45.5	8	5.0	7.5	260			
Maximum		68.0	12	15.0	8.0	375			
Mean		56.9	10	8.5	7.9	328.4			

Table 10. Sleepy Hollow Weir Water Quality Data For WY 1995

Date	Time	Temperature (F)	Dissolved Oxygen (mg/L)	Carbon Dioxide (mg/L)	pH	Specific Conductance (umhos)	Color	Odor	Turbidity
20-Oct-94	11:00	54.0	9	5.0	8.0	345	clear	none	none
31-Oct-94	15:30	57.0	9	10.0	8.0	335	clear	none	none
14-Nov-94	10:00	50.0	11	10.0	8.0	390	clear	none	none
01-Dec-94	13:00	48.0	11	5.0	8.0	370	clear	none	none
15-Dec-94	12:00	45.0	10	10.0	8.0	350	clear	none	none
29-Dec-94	13:30	46.5	11	5.0	8.0	360	clear	none	none
16-Jan-95	10:30	50.0	12	5.0	7.5	150	brownish	none	mod.
30-Jan-95	14:00	52.0	10	5.0	7.5	175	clear	none	slight
17-Feb-95	15:00	49.5	12	5.0	7.5	215	clear	none	none
30-Mar-95	11:00	51.0	11	5.0	8.0	215	grn/grey	none	mod.
13-Apr-95	15:00	55.0	10	5.0	8.0	245	none	none	slight
01-May-95	14:15	58.0	11	NA	7.8	225	clear	none	mod.
15-May-95	14:30	54.0	10	5.0	8.0	240	grey/grn.	none	mod.
30-May-95	11:30	62.0	11	10.0	8.0	240	clear	none	slight
16-Jun-95	12:15	60.0	11	5.0	8.0	225	olive grn	none	mod.
03-Jul-95	14:00	70.0	8	5.0	7.5	NA	clear	none	none
14-Jul-95	13:30	72.0	9	7.5	8.0	285	clear	none	none
28-Jul-95	13:30	73.0	9	5.0	8.0	300	clear	none	none
25-Aug-95	14:45	70.0	9	10.0	8.0	310	clear	none	none
01-Sep-95	09:30	63.0	8	10.0	8.0	310	clear	metalic	none
15-Sep-95	13:00	70.0	11	10.0	8.0	310	clear	none	none
29-Sep-95	10:40	66.0	10	10.0	8.0	325	clear	none	none
Minimum		45.0	8	5.0	7.5	150			
Maximum		73.0	12	10.0	8.0	390			
Mean		58.0	10.1	7.0	7.9	281.9			

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Table 11. Sleepy Hollow Weir Water Quality Data For WY 1996

Date	Time	Temperature (F)	Dissolved Oxygen (mg/L)	Carbon Dioxide (mg/L)	pH	Specific Conductance (umhos)	Color	Odor	Turbidity
13-Oct-95	12:30	63.0	13.0	10.0	8.0	330	clear	none	none
2-Nov-95	12:35	59.0	11.0	5.0	8.0	335	clear	none	none
15-Nov-95	13:30	57.0	10.0	10.0	8.0	350	clear	none	none
01-Dec-95	13:30	53.0	11.0	10.0	8.0	355	clear	none	none
14-Dec-95	15:00	53.0	11.0	10.0	8.0	325	yellow/brwn	none	high
02-Jan-96	15:30	50.0	10.0	5.0	8.0	305	clear	none	none
16-Jan-96	12:35	50.0	11.0	5.0	8.0	320	clear	none	moderate
01-Feb-96	10:05	52.0	12.0	5.0	8.0	175	slightly brwn	none	high
15-Feb-96	10:45	53.0	11.0	10.0	8.0	205	clear	none	none
01-Mar-96	14:00	50.0	12.0	10.0	7.5	175	clear	none	slight/mod
18-Mar-96	14:15	56.0	12.0	10.0	8.0	200	clear	none	none
03-Apr-96	14:00	55.0	12.0	NA	8.0	210	clear	none	none
17-Apr-96	10:25	56.0	10.0	5.0	8.0	225	clear	none	none
30-Apr-96	12:50	64.0	11.0	5.0	8.0	230	clear	none	none
20-May-96	12:00	62.0	10.0	10.0	8.0	220	clear	none	none
03-Jun-96	13:45	70.0	10.0	10.0	8.0	230	clear	none	none
18-Jun-96	13:00	68.0	10.0	10.0	8.0	245	clear	none	none
01-Jul-96	12:15	72.0	9.0	10.0	8.0	245	clear	none	none
15-Jul-96	11:20	71.0	9.0	5.0	8.0	255	clear	none	none
07-Aug-96	16:15	74.0	9.0	5.0	8.0	275	clear	none	none
14-Aug-96	15:00	76.0	10.0	10.0	8.0	275	clear	none	none
29-Aug-96	16:00	74.0	8.0	7.5	7.5	310	clear	none	none
Minimum		50.0	8.0	5.0	7.5	175			
Maximum		76.0	13.0	10.0	8.0	355			
Mean		60.8	10.5	8.0	8.0	263.4			

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Table II-B-1. Semi-monthly water quality data collected at Sleepy Hollow Weir Site for WY 1997.

Date	Time (24 hr)	Temperature (F)	Dissolved Oxygen (mg/L)	Carbon Dioxide (mg/L)	pH	Conductivity (uS/cm)	Turbidity
01-Oct-96	13:50	64.0	11.0	5.0	8.0	380	none
17-Oct-96	12:00	57.0	10.0	5.0	8.0	335	none
06-Nov-96	10:00	50.0	10.0	5.0	8.0	380	none
16-Nov-96	15:00	53.0	10.0	5.0	8.0	380	none
02-Dec-96	13:30	48.0	11.0	5.0	8.0	260	none
14-Jan-97	15:30	46.0	12.0	5.0	8.0	175	none
03-Feb-97	15:00	51.0	11.0	5.0	7.5	180	none
14-Feb-97	13:00	49.0	12.0	5.0	8.0	190	slight
28-Feb-97	13:30	50.0	10.0	5.0	8.0	215	none
13-Mar-97	11:15	51.0	12.0	5.0	8.0	225	none
31-Mar-97	12:30	57.0	11.0	5.0	8.0	250	none
15-Apr-97	13:45	60.0	10.0	5.0	8.0	255	none
01-May-97	12:50	60.0	10.0	5.0	8.0	265	none
14-May-97	11:20	63.0	11.0	5.0	8.0	275	none
30-May-97	12:35	69.5	10.0	5.0	8.0	295	none
17-Jun-97	13:00	72.5	8.0	5.0	8.0	320	none
01-Jul-97	13:10	69.5	10.0	5.0	8.0	305	none
17-Jul-97	12:15	71.5	10.0	5.0	8.0	320	none
01-Aug-97	11:40	68.0	10.0	5.0	8.0	350	none
14-Aug-97	13:25	75.0	10.0	5.0	8.0	330	none
04-Sep-97	15:30	74.0	8.0	5.0	8.0	340	none
16-Sep-97	13:30	68.0	9.0	5.0	8.0	N/A	none
Minimum		46.0	8.0	5.0	7.5	175	
Maximum		75.0	12.0	5.0	8.0	380	
Average		60.3	10.3	5.0	8.0		

Table II-B-2. Semi-monthly water quality data collected at Sleepy Hollow Weir Site for WY 1998.

Date	Time (24 hr)	Temperature (F)	Dissolved Oxygen (mg/L)	Carbon Dioxide (mg/L)	pH	Conductivity (uS/cm)	Turbidity
01-Oct-97	10:25	65.0	9.0	5.0	8.0	365	none
15-Oct-97	10:20	59.0	10.0	5.0	8.0	370	none
31-Oct-97	12:10	60.5	10.0	5.0	8.0	410	none
17-Nov-97	13:00	56.0	9.0	5.0	8.0	400	slight
02-Dec-97	11:45	51.0	11.0	5.0	8.0	280	slight
15-Dec-97	10:45	49.5	12.0	5.0	8.0	255	moderate
31-Dec-97	14:00	44.0	12.0	5.0	8.0	300	slight
14-Jan-98	10:30	50.0	11.0	5.0	7.5	175	moderate
29-Jan-98	14:30	52.0	10.0	5.0	7.5	190	high
13-Feb-98	13:25	54.0	12.0	5.0	8.0	180	moderate
27-Feb-98	9:30	52.5	12.0	5.0	8.0	205	moderate
17-Mar-98	14:30	57.0	11.0	5.0	8.0	245	slight
02-Apr-98	11:10	51.5	11.0	5.0	8.0	235	high
15-Apr-98	15:15	53.0	11.0	5.0	8.0	240	slight
30-Apr-98	12:00	60.0	11.0	5.0	8.0	270	none
14-May-98	13:30	55.0	10.0	5.0	7.5	260	none
29-May-98	11:15	56.0	11.0	5.0	8.0	295	moderate
15-Jun-98	13:30	67.5	10.0	5.0	7.5	330	slight
01-Jul-98	15:30	66.5	10.0	5.0	7.5	340	none
16-Jul-98	14:05	72.5	10.0	5.0	8.0	340	none
29-Jul-98	12:15	69.5	10.0	5.0	8.0	310	none
17-Aug-98	10:25	67.0	9.0	10.0	8.0	330	none
31-Aug-98	12:15	71.0	9.0	5.0	8.0	325	none
14-Sep-98	15:15	72.0	10.0	5.0	8.0	330	none
30-Sep-98	12:15	64.0	9.0	5.0	7.5	345	none
Minimum		44.0	9.0	5.0	7.5	175	
Maximum		72.5	12.0	10.0	8.0	410	
Average		59.0	10.4	5.2	7.9		

Table II-B-3. Semi-monthly water quality data collected at Sleepy Hollow Weir Site for WY 1999.

Date	Time (24 hr)	Temperature (F)	Dissolved Oxygen (mg/L)	Carbon Dioxide (mg/L)	pH	Conductivity (uS/cm)	Turbidity
30-Oct-98	13:30	57.0	11.0	5.0	8.0	340	none
03-Dec-98	11:40	53.0	10.0	5.0	8.0	295	slight
04-Jan-99	13:10	44.5	13.0	5.0	8.0	325	none
19-Jan-99	15:05	53.0	13.0	5.0	8.0	325	none
01-Feb-99	10:35	46.0	13.0	5.0	8.0	220	high
16-Feb-99	12:00	48.0	13.0	10.0	7.5	195	slight
05-Mar-99	11:40	49.5	14.0	5.0	8.0	210	none
18-Mar-99	7:20	51.0	12.0	5.0	7.5	205	none
01-Apr-99	11:40	51.0	13.0	5.0	8.0	185	slight
14-Apr-99	13:00	55.0	12.0	5.0	8.0	185	moderate
30-Apr-99	11:10	55.0	12.0	5.0	7.5	205	none
14-May-99	12:15	58.0	11.0	5.0	8.0	215	none
28-May-99	13:40	65.0	12.0	5.0	7.5	230	none
15-Jun-99	15:45	68.0	10.0	5.0	8.0	250	none
01-Jul-99	12:00	71.5	11.0	5.0	8.0	245	none
17-Jul-99	15:15	73.5	11.0	5.0	8.0	260	none
30-Jul-99	10:35	66.5	10.0	5.0	7.5	275	none
21-Aug-99	12:00	69.0	12.0	5.0	8.0	370	none
01-Sep-99	11:30	68.0	10.0	10.0	8.0	322	none
14-Sep-99	13:00	69.0	11.0	10.0	8.0	318	none
30-Sep-99	13:00	67.0	11.0	10.0	8.0	314	none
Minimum		44.5	10.0	5.0	7.5	185	
Maximum		73.5	14.0	10.0	8.0	370	
Average		59.0	11.7	6.0	7.9		

Table II-B-4. Semi-monthly water quality data collected at Sleepy Hollow Weir Site for WY 2000.

Date	Time (24 hr)	Temperature (F)	Dissolved Oxygen (mg/L)	Carbon Dioxide (mg/L)	pH	Conductivity (uS/cm)	Turbidity
15-Oct-99	13:15	65.0	11.0	10.0	8.0	321	none
29-Oct-99	14:05	61.0	11.0	5.0	8.0	445	none
16-Nov-99	10:30	57.0	11.0	10.0	8.0	365	none
30-Nov-99	14:30	54.0	13.0	5.0	8.0	354	none
20-Dec-99	15:25	48.0	13.0	5.0	7.5	368	none
05-Jan-00	13:30	48.0	13.0	5.0	8.0	359	none
19-Jan-00	9:30	53.0	12.0	5.0	8.0	290	slight
02-Feb-00	13:00	54.0	13.0	5.0	8.0	203	none
15-Feb-00	12:45	54.0	12.0	5.0	7.5	129	high
01-Mar-00	11:25	53.0	13.0	5.0	7.5	166	moderate
15-Mar-00	13:30	58.0	13.0	5.0	8.0	184	none
05-Apr-00	11:00	59.0	10.0	5.0	8.0	229	none
18-Apr-00	11:30	58.0	12.0	10.0	8.0	224	slight
02-May-00	11:35	62.0	11.0	5.0	7.5	234	none
16-May-00	12:35	60.0	12.0	5.0	8.0	232	none
31-May-00	13:00	68.0	14.0	10.0	7.5	258	none
16-Jun-00	13:45	74.5	11.0	5.0	8.0	258	none
19-Jul-00	14:30	71.6	10.0	5.0	8.0	265	none
31-Jul-00	14:20	74.0	14.0	5.0	8.0	274	none
22-Aug-00	11:00	66.0	12.0	5.0	8.0	293	none
31-Aug-00	11:00	66.0	11.0	5.0	8.0	297	none
14-Sep-00	12:10	67.0	11.0	5.0	8.0	306	none
28-Sep-00	10:55	65.0	12.0	5.0	8.0	316	none
Minimum		48.0	10.0	5.0	7.5	129	
Maximum		74.5	14.0	10.0	8.0	445	
Average		60.7	12.0	5.9	7.9		

Table II-B-5. Semi-monthly water quality data collected at Sleepy Hollow Weir Site for WY 2001.

Date	Time (24 hr)	Temperature (F)	Dissolved Oxygen (mg/L)	Carbon Dioxide (mg/L)	pH	Conductivity (uS/cm)	Turbidity
23-Oct-00	12:35	59.0	11.0	5.0	8.0	319	slight
07-Nov-00	10:00	53.0	11.0	5.0	8.0	297	slight
14-Nov-00	12:00	49.0	13.0	5.0	7.5	294	none
30-Nov-00	12:45	49.0	11.0	5.0	7.5	280	none
14-Dec-00	11:00	50.0	11.0	5.0	8.0	283	none
02-Jan-01	10:45	45.0	13.0	5.0	8.0	277	none
12-Jan-01	13:15	48.0	14.0	5.0	8.0	191	high
05-Feb-01	14:00	51.0	12.0	5.0	8.0	221	none
13-Feb-01	14:00	46.0	13.0	5.0	8.0	183	slight
27-Feb-01	12:15	50.5	12.0	5.0	8.0	171	slight
20-Mar-01	9:50	55.5	12.0	5.0	7.5	192	none
05-Apr-01	12:25	54.0	13.0	5.0	8.0	204	none
17-Apr-01	10:00	54.0	12.0	5.0	8.0	183	none
03-May-01	12:20	61.0	11.0	5.0	8.0	203	none
14-May-01	14:30	64.0	9.0	5.0	8.0	199	none
04-Jun-01	15:10	67.5	11.0	5.0	8.0	206	none
21-Jun-01	14:45	73.0	9.0	5.0	8.0	277	none
12-Jul-01	15:30	72.0	10.0	5.0	8.0	220	none
07-Aug-01	15:30	74.0	8.0	5.0	8.0	232	slight
29-Aug-01	15:00	73.0	11.0	5.0	8.0	289	none
15-Sep-01	14:30	70.5	12.0	5.0	8.0	292	none
Minimum		45.0	8.0	5.0	7.5	171	
Maximum		74.0	14.0	5.0	8.0	319	
Average		58.0	11.4	5.0	7.9		

Table II-B-6. Semi-monthly water quality data collected at Sleepy Hollow Weir Site for WY 2002.

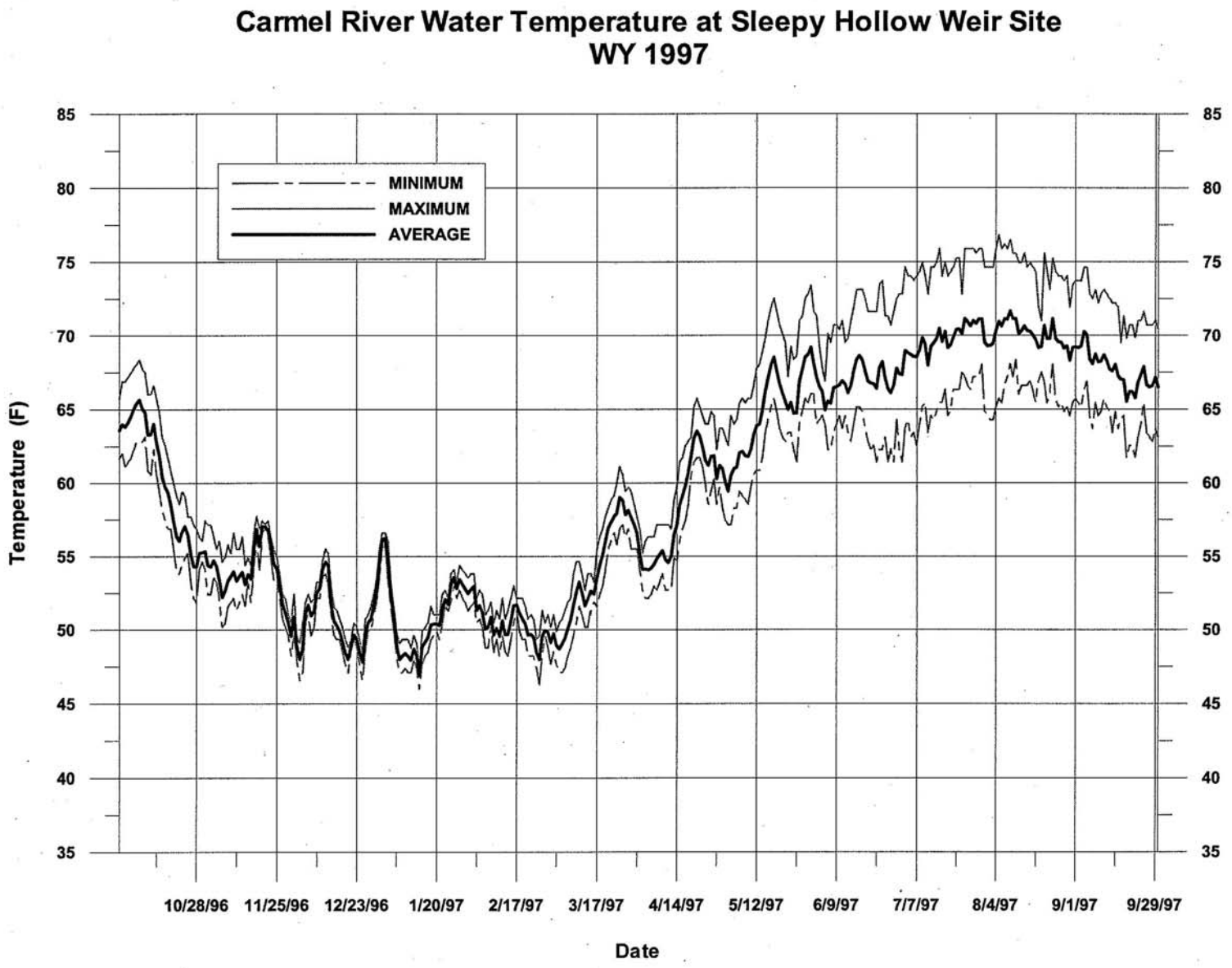
Date	Time (24 hr)	Temperature (F)	Dissolved Oxygen (mg/L)	Carbon Dioxide (mg/L)	pH	Conductivity (uS/cm)	Turbidity
06-Oct-01	13:30	65.5	12.0	5.0	8.0	270	none
23-Oct-01	13:45	61.5	12.0	10.0	8.0	309	none
29-Nov-01	11:00	52.0	11.0	10.0	8.0	267	slight
11-Jan-02	15:30	50.5	12.0	5.0	8.0	N/A	none
30-Jan-02	12:00	43.0	11.0	5.0	8.0	199	none
11-Feb-02	15:20	49.0	14.0	5.0	8.0	186	none
27-Feb-02	11:40	54.0	13.0	5.0	8.0	190	none
15-Mar-02	10:35	52.0	13.0	5.0	8.0	206	low
28-Mar-02	11:40	54.0	12.0	5.0	7.5	189	none
15-Apr-02	13:15	60.0	11.0	5.0	8.0	208	low
30-Apr-02	13:20	56.0	12.0	5.0	8.0	213	low
15-May-02	12:41	65.0	13.0	5.0	8.0	222	none
29-May-02	9:45	65.0	11.0	5.0	8.0	226	none
17-Jun-02	13:15	69.0	12.0	5.0	8.0	224	low
01-Jul-02	12:20	74.0	12.0	5.0	8.0	238	none
16-Jul-02	16:00	73.0	10.0	5.0	8.0	242	none
31-Jul-02	13:30	74.0	12.0	5.0	7.5	269	none
16-Aug-02	13:38	69.0	10.0	5.0	8.0	276	none
02-Sep-02	11:35	69.5	10.0	5.0	8.0	283	none
20-Sep-02	8:45	65.0	9.0	5.0	8.0	297	none
Minimum		43.0	9.0	5.0	7.5	186	
Maximum		74.0	14.0	10.0	8.0	309	
Average		61.1	11.6	5.5	8.0		

Table II-B-7. Semi-monthly water quality data collected at Sleepy Hollow Weir Site for WY 2003.

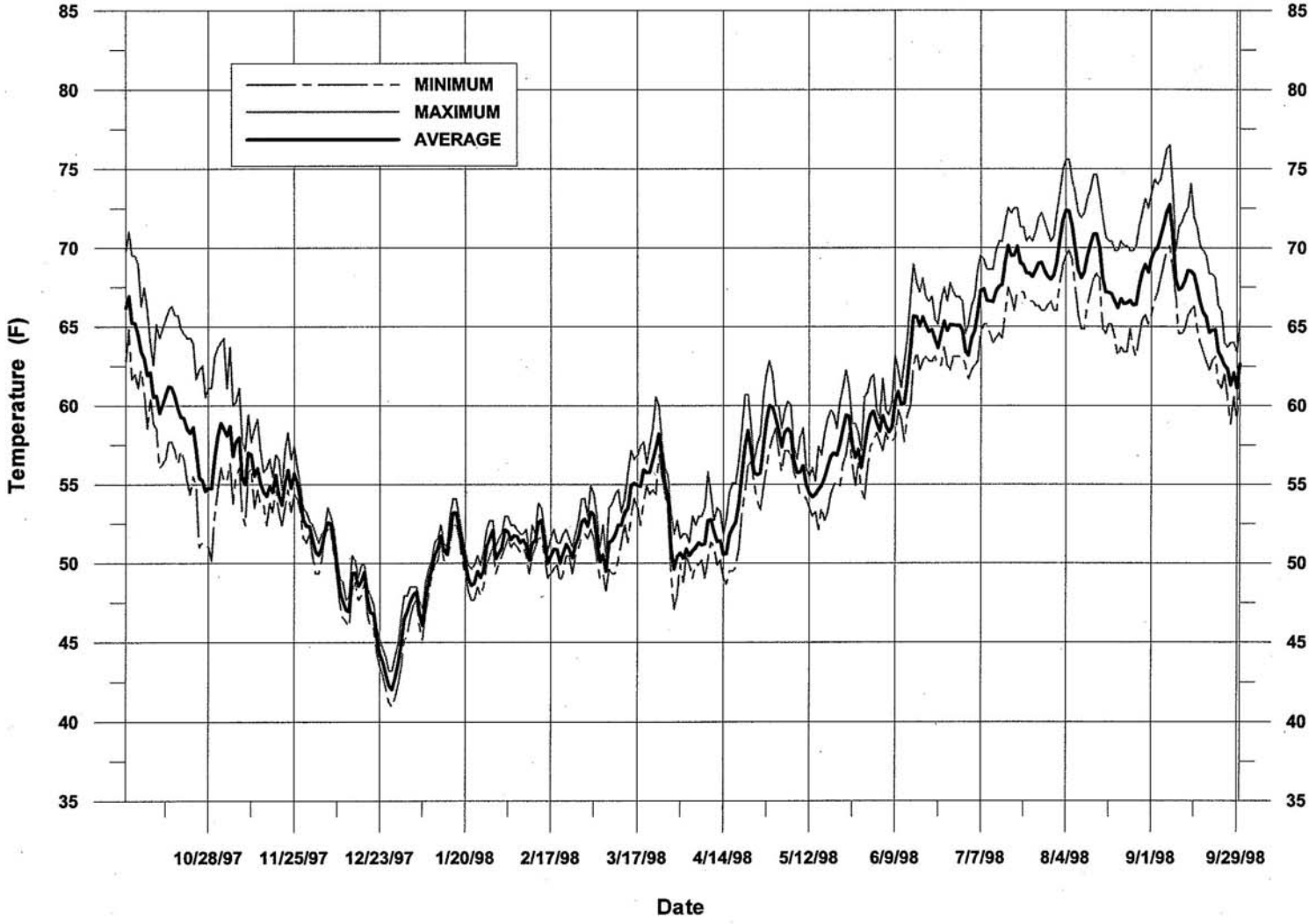
Date	Time	Temperature	Dissolved Oxygen	Carbon Dioxide	pH	Conductivity	Turbidity
	24 hr	(F)	(mg/L)	(mg/L)		(uS/cm)	(NTU)
3-Oct-02	11:08	61.0	12.0	5.0	8.0	304	N/A
18-Oct-02	10:55	59.0	11.0	5.0	8.0	306	N/A
1-Nov-02	10:45	53.0	11.0	5.0	8.0	317	N/A
15-Nov-02	10:30	56.0	10.0	10.0	8.0	229	N/A
27-Nov-02	10:15	51.0	11.0	5.0	8.0	234	N/A
12-Dec-02	10:20	50.0	12.0	10.0	8.0	244	N/A
27-Dec-02	9:50	50.0	11.0	5.0	8.0	187	0.5
10-Jan-03	10:30	53.0	11.0	5.0	7.5	179	3.8
24-Jan-03	10:35	53.0	12.0	10.0	8.0	198	0.15
7-Feb-03	10:05	48.0	13.0	10.0	8.0	206	0
21-Feb-03	10:15	51.0	12.0	10.0	8.0	211	0
5-Mar-03	12:55	53.0	12.0	5.0	8.0	216	0.15
8-Apr-03	13:20	58.0	11.0	10.0	8.0	226	0.45
22-Apr-03	12:00	55.0	10.0	5.0	8.0	208	0.1
9-May-03	10:30	55.0	10.0	10.0	7.5	203	0.1
23-May-03	11:15	63.0	10.0	10.0	8.0	221	0.35
6-Jun-03	10:35	65.0	9.0	10.0	8.0	232	0.35
20-Jun-03	10:45	64.0	9.0	10.0	8.0	239	0.55
3-Jul-03	9:45	67.0	10.0	20.0	8.0	279	6.8
23-Jul-03	12:10	70.0	10.0	15.0	7.5	289	11
6-Aug-03	14:25	73.0	10.0	15.0	8.0	298	9.2
22-Aug-03	10:20	68.0	9.0	15.0	8.0	303	11
5-Sep-03	10:50	67.0	10.0	30.0	8.0	323	11
19-Sep-03	10:45	64.0	10.0	15.0	8.0	331	19
Minimum		48.0	9.0	5.0	7.5	179	0.0
Maximum		73.0	13.0	30.0	8.0	331	19.0
Average		58.6	10.7	10.4	7.9		

Appendix Q-12

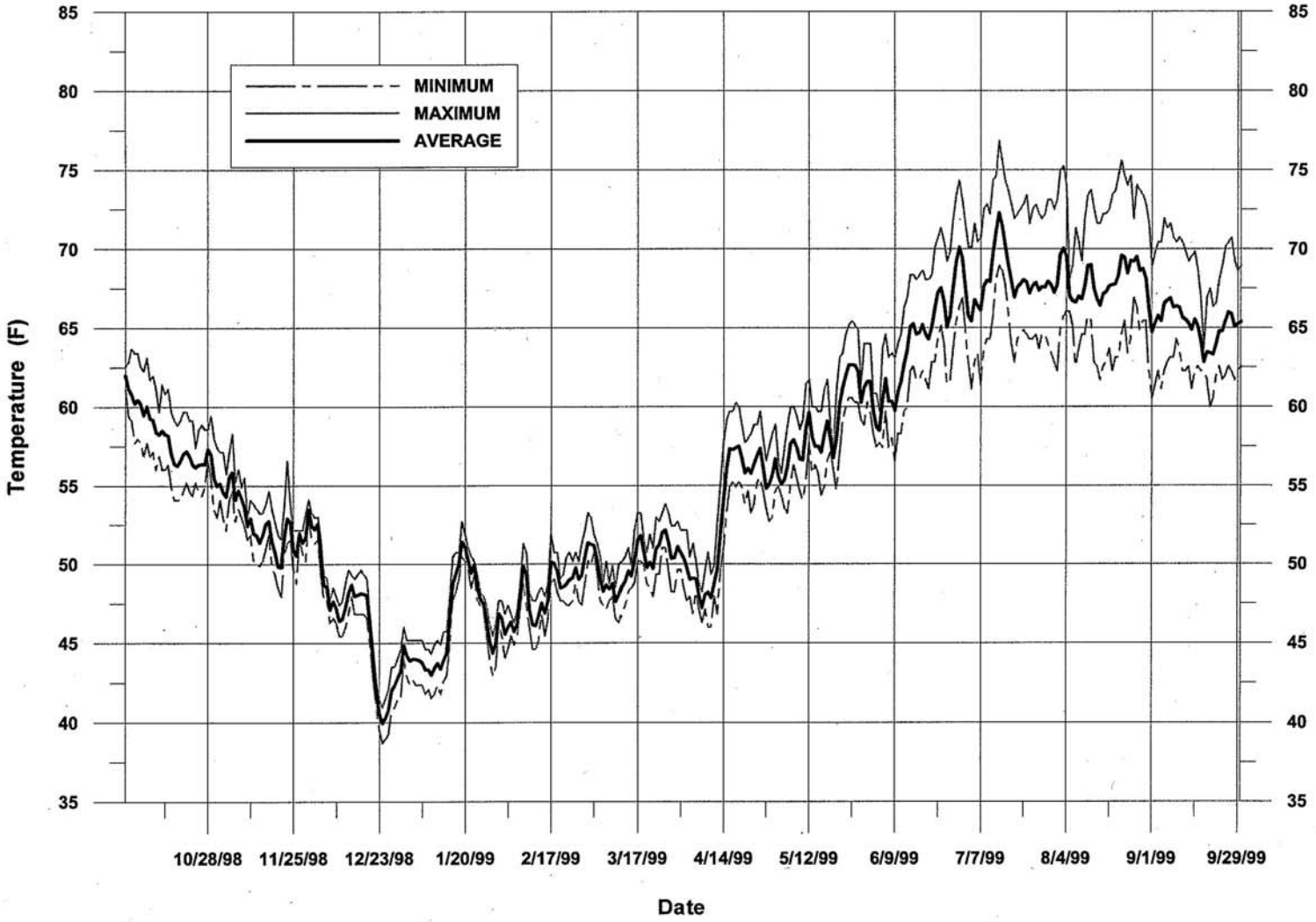
MPWMD Continuous Temperature Data Graphs at SHW, 1996-2003

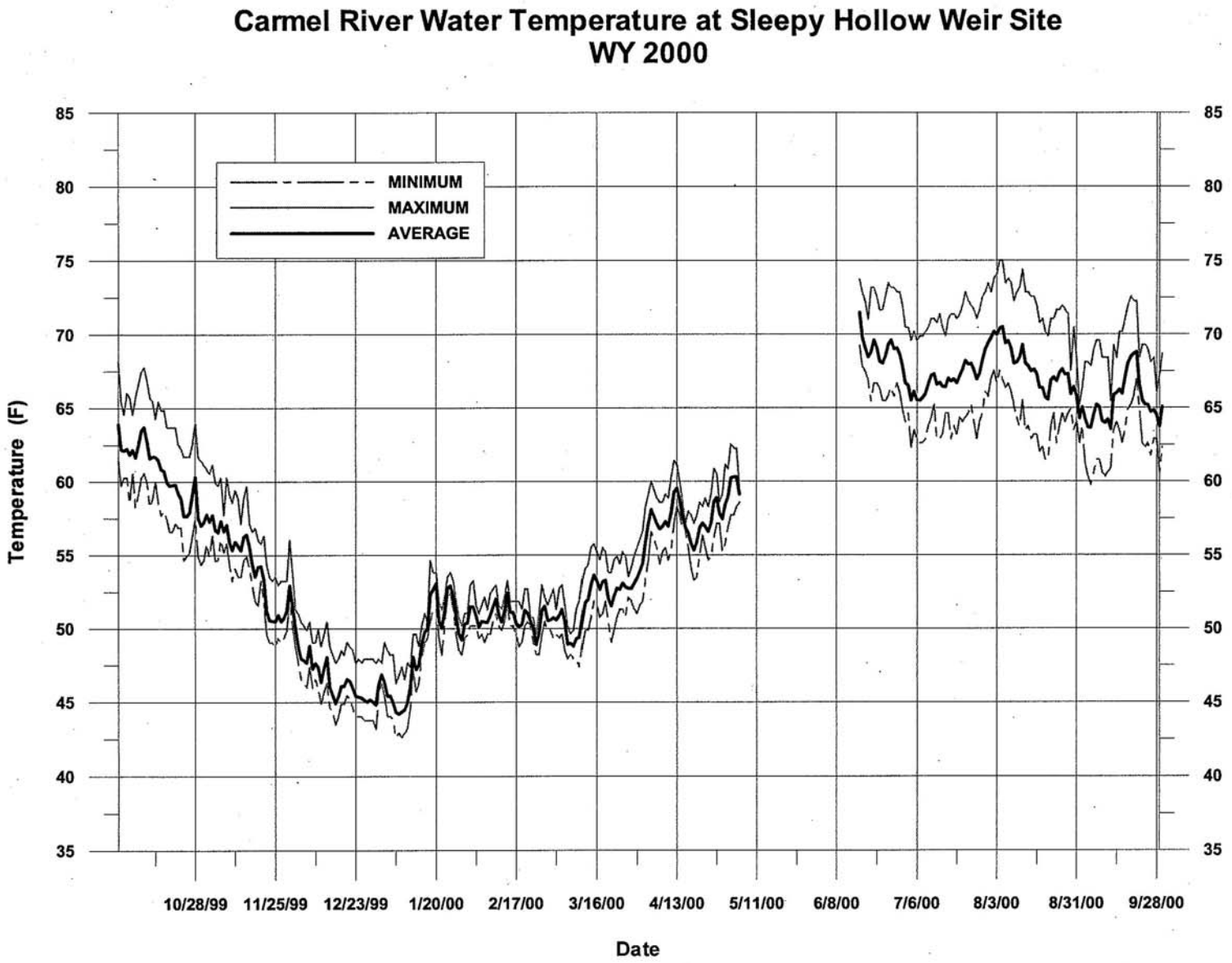

Carmel River Water Temperature at Sleepy Hollow Weir Site
WY 1997
MINIMUM
MAXIMUM
AVERAGE
Temperature (F)
85
80
75
70
65
60
55
50
45
40
35
10/28/96
11/25/96
12/23/96
1/20/97
2/17/97
3/17/97
4/14/97
5/12/97
6/9/97
7/7/97
8/4/97
9/1/97
9/29/97
Date

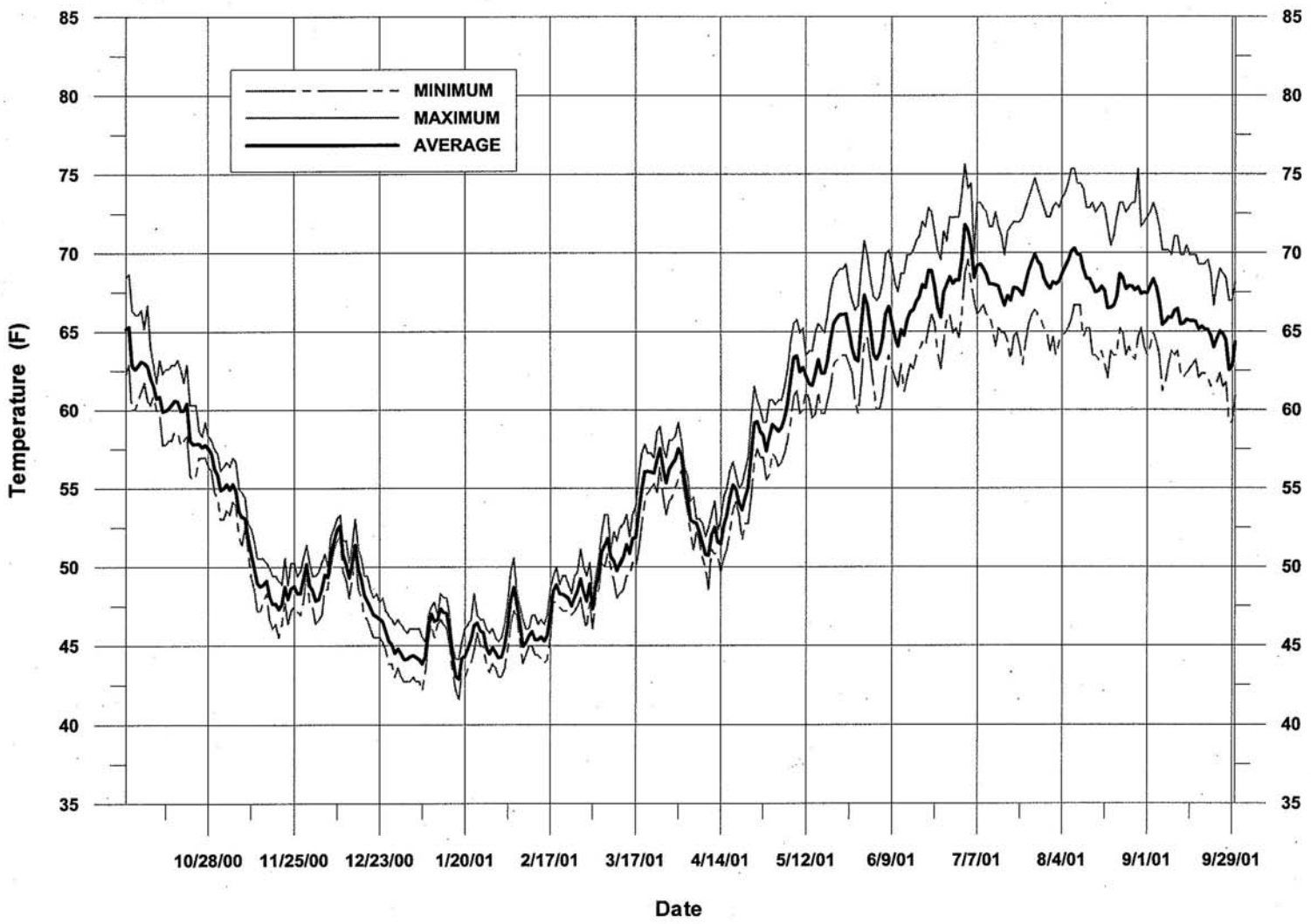
Carmel River Water Temperature at Sleepy Hollow Weir Site
WY 1998



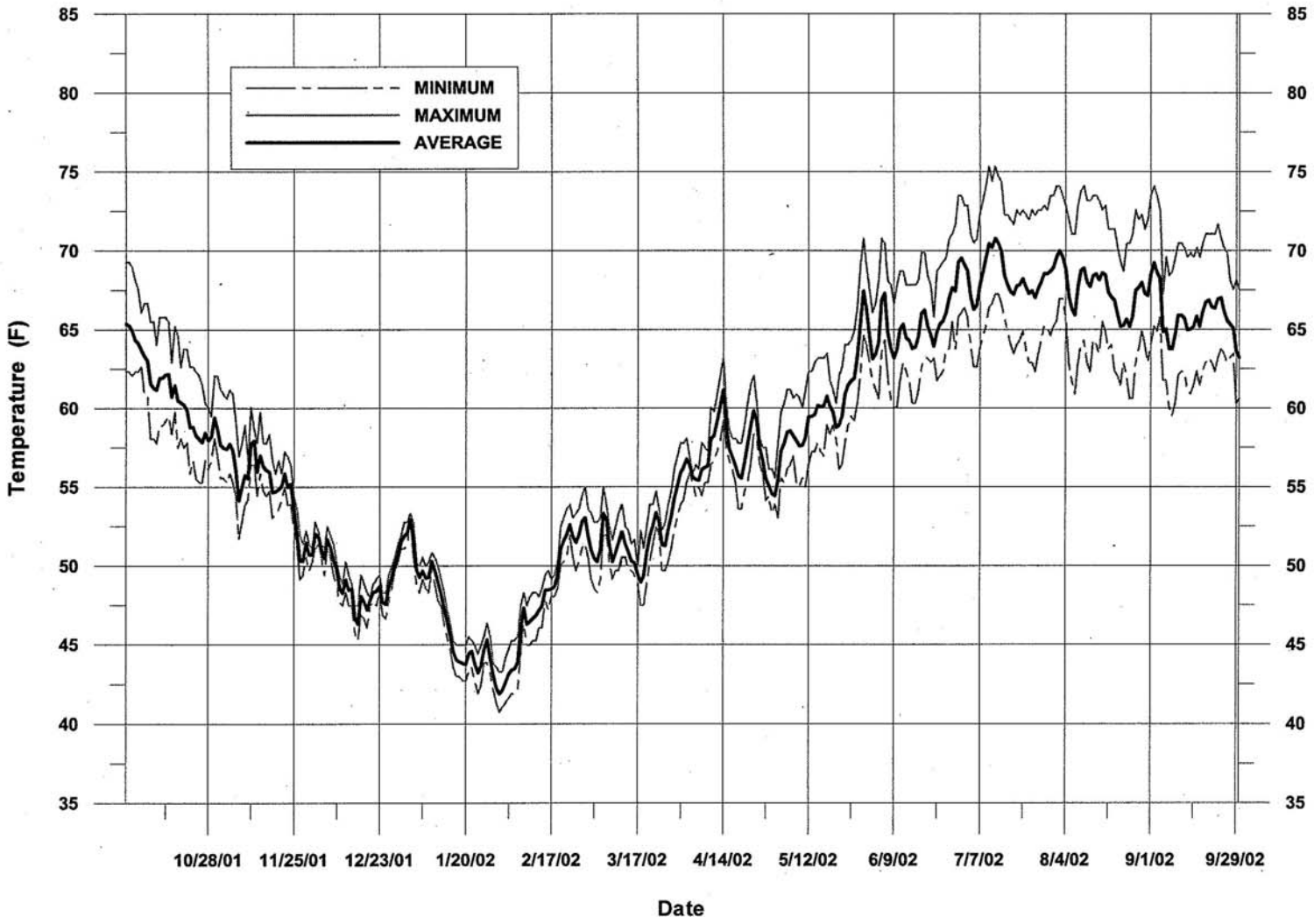
Carmel River Water Temperature at Sleepy Hollow Weir Site
WY 1999



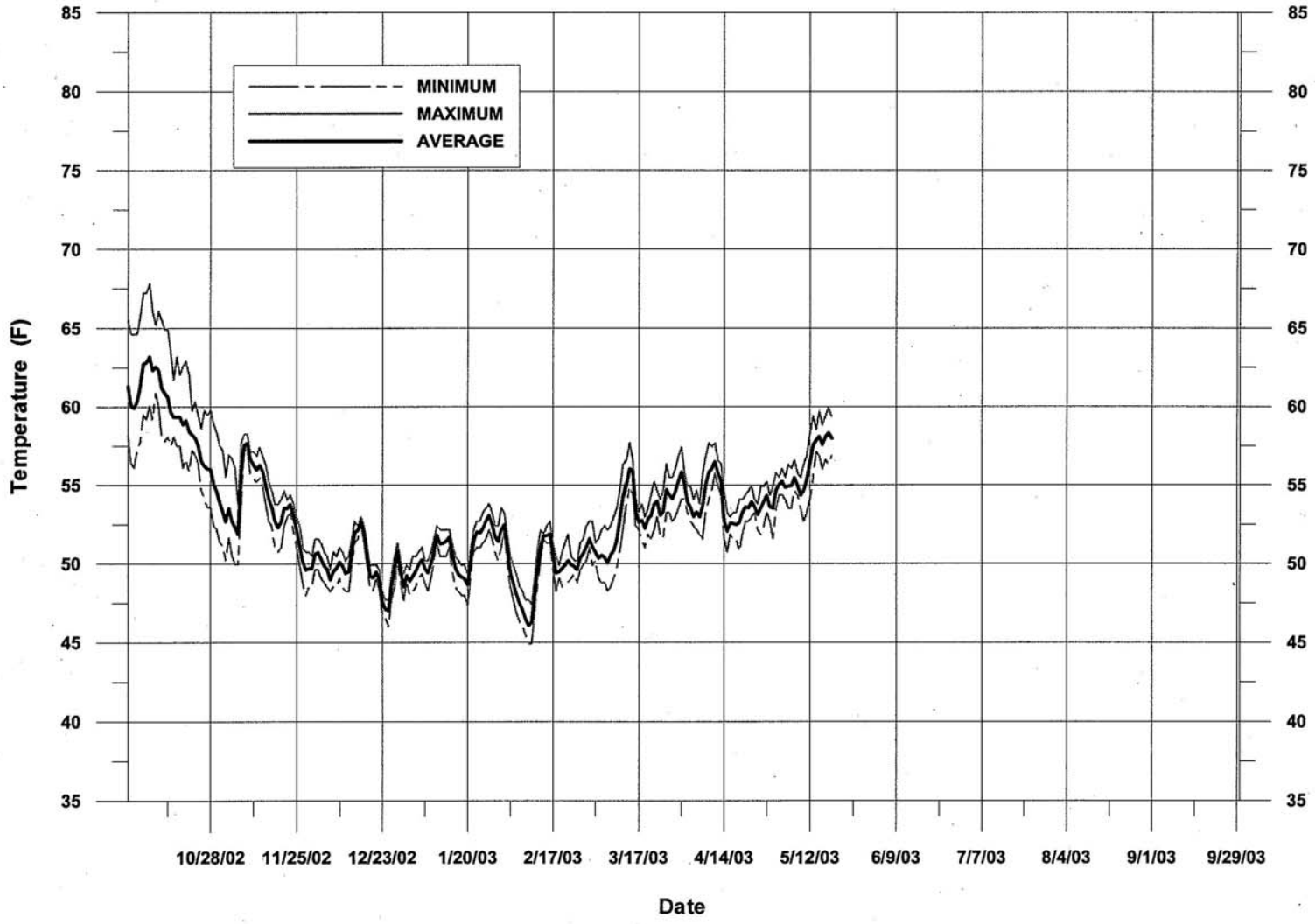

Carmel River Water Temperature at Sleepy Hollow Weir Site
WY 2000
MINIMUM
MAXIMUM
AVERAGE
Temperature (F)
85
80
75
70
65
60
55
50
45
40
35
10/28/99
11/25/99
12/23/99
1/20/00
2/17/00
3/16/00
4/13/00
5/11/00
6/8/00
7/6/00
8/3/00
8/31/00
9/28/00
Date


Carmel River Water Temperature at Sleepy Hollow Weir Site
WY 2001
MINIMUM
MAXIMUM
AVERAGE
Temperature (F)
85
80
75
70
65
60
55
50
45
40
35
10/28/00
11/25/00
12/23/00
1/20/01
2/17/01
3/17/01
4/14/01
5/12/01
6/9/01
7/7/01
8/4/01
9/1/01
9/29/01
Date

Carmel River Water Temperature at Sleepy Hollow Weir Site
WY 2002



Carmel River Water Temperature at Sleepy Hollow Weir Site
WY 2003



Appendix R

SPILL PREVENTION AND CONTAINMENT PLAN

San Clemente Dam Seismic Retrofit Project

SPILL PREVENTION, CONTAINMENT, AND COUNTERMEASURE PLAN

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SPILL PREVENTION, CONTAINMENT, AND COUNTERMEASURE PLAN

1. INTRODUCTION

The California-American Water Company (CAW) has prepared this Spill Prevention, Containment, and Countermeasure (SPCC) Plan to be implemented during construction of improvements to the San Clemente Dam Seismic Retrofit Project. This SPCC Plan outlines specific preventive measures and practices to reduce the likelihood of an accidental release of a hazardous or regulated liquid and to expedite cleanup of any release that may occur during construction activities.

This SPCC Plan restricts the location of fuel storage, fueling activities, and construction equipment maintenance within the construction area and provides procedures for these activities. Training and lines of communication to facilitate the prevention, response, containment, and cleanup of spills during construction activities are also outlined. The goals of this plan are to minimize the potential for a spill of these materials, to contain any spillage to the smallest area possible, and to protect areas that are considered environmentally sensitive (e.g., streams, reservoirs, groundwater wells, wetlands, etc.).

All contractor and subcontractor personnel working on San Clemente Dam are responsible for implementation of the measures and procedures defined in this SPCC Plan. This plan will be included as written herein in both the bid and the contract documents as contractual requirements and instructions to the contractor.

2. PREVENTATIVE MEASURES

CAW will require that the contractor will do everything practicable to minimize the potential for a spill during construction of the San Clemente Dam facilities. CAW will require the contractor to comply with applicable environmental and safety laws and regulations, including compliance by its subcontractors. The contractor will be required to ensure that a copy of this plan is available onsite to all contractor and subcontractor personnel.

2.1 TRAINING

All contractor employees and subcontractors involved with transporting or handling fueling equipment or maintaining construction equipment will be required to complete spill training before they commence work on the project site. CAW will audit contractor compliance with this requirement and instruct the contractor to replace any of its (or its subcontractors') employees found to be working on the project site prior to having spill training. Spill training will also be required for contractor supervisory personnel and subcontractor supervisory personnel prior to commencement of work on the project site.

Spill training programs will be conducted by the construction contractor and a representative of CAW and will:

- provide information concerning pollution control laws;
- inform personnel concerning the proper operation and maintenance of fueling equipment; and

- Inform personnel of spill prevention and response requirements.

Measures, responsibilities, and provisions of this SPCC Plan and identification of response team individuals (Attachment A) will be incorporated into the training.

Training for other workers will be provided through ongoing weekly meetings, which will be held to discuss safety and spill handling, including informing them of their personal responsibility to initiate appropriate procedures. These weekly sessions will be held by the contractor as crew "tail gate" meetings. CAW will audit the contractor compliance with this requirement and instruct the contractor to replace any of its (or its subcontractors') foremen found to not be holding such meetings following the receipt of one warning.

2.2 RELEASE RESPONSE EQUIPMENT

The contractor will supply each construction crew with a sufficient quantity of absorbent and barrier materials to adequately contain and recover spills of on-board fuel and lubricants for the piece of equipment with the largest volume of fuel plus lubricant. These materials may include drip pans, buckets, absorbent pads, containment booms, straw bales, absorbent clay, sawdust, floor-drying agents, spill containment barriers, plastic sheeting, skimmer pumps, covered holding tanks, fire extinguishers, and other materials as necessary.

The contractor's Spill Coordinator (Section 4.1) will make known to all personnel involved with construction (foremen, laborers, inspectors), the contractor's yard, and warehouse locations of spill response equipment and materials. Spill response material will be readily accessible during construction.

2.3 EQUIPMENT INSPECTION

Prior to moving any equipment onto the construction site, the contractor will visually inspect each piece of equipment for cracks, excessive corrosion, or other flaws that may compromise the integrity of its fuel, hydraulic, or cooling systems. The contractor will repair or replace leaking equipment immediately after a leak is detected.

3. REGULATED MATERIALS STORAGE AND HANDLING

3.1 CONTRACTOR YARDS

Contractors will store fuel, petroleum products, and hazardous materials at the construction yards in safe locations within secondary containment structures. The secondary containment system normally consists of lining a bermed area with an impervious liner material to provide a minimum containment volume equal to 150 percent of the volume of the largest storage vessel contained within the bermed area. The contractor will construct these containment structures to contain spilled or leaked liquids within the structures. If earthen containment dikes are used, they will be constructed with slopes no steeper than 3:1 (horizontal to vertical) to limit erosion and provide structural stability. Containment areas will not have drains.

Bulk storage tanks will not be placed in areas subject to periodic flooding or erosion. Accumulated rainwater may be removed if authorized by an Environmental Inspector under specific situations. Specifically, if visual inspection indicates that no spillage has occurred in the

containment structure and if no sheen is present on the accumulated rainwater, the CAW Environmental Inspector may approve the accumulated water to be pumped out and released on surrounding upland areas. If hydrocarbon spillage has occurred in the structure, accumulated wastewater will be drawn off and pumped into a storage vessel for proper disposal.

The contractor will visually inspect aboveground bulk tanks frequently and whenever the tank is refilled. Drain valves on temporary storage tanks will be locked to prevent accidental or unauthorized discharges from the tank. The Contractor will correct visible leaks in tanks as soon as possible.

All fuel nozzles will be equipped with functional automatic shut-off valves. Prior to departure of any fuel tank truck, all outlets on the vehicle will be examined by the driver for leakage and tightened, adjusted, or replaced to prevent liquid leaking while in transit.

Routine equipment maintenance of wheel-mounted vehicles such as oil changes will be accomplished at the contractor yards or staging areas to the greatest extent practical. Routine maintenance of track-mounted equipment will be conducted in a manner to gather all oil and other discharges and removed from the project site to a suitable recycling or disposal site.

Storage containers will display labels that identify the contents of the container and whether the contents are hazardous. The contractor will provide and maintain copies of Material Safety Data Sheets (MSDS) for all materials accessible to all contractor personnel including subcontractors.

Attachment B presents typical vehicle and equipment fuels, lubricants, and hazardous materials stored or used during construction and briefly describes the location, typical quantities, and usual methods of storage. Storage methods and quantities vary with length of construction spread, time of year, and type of terrain. The contractor will provide, maintain, and make available the appropriate MSDS documents for all hazardous or controlled materials utilized on the PROJECT SITE or in the contractor yards at a location accessible to all contractor, subcontractor, and CAW employees.

3.2 IN THE CONSTRUCTION AREA

The contractor will undertake preventative measures to avoid environmental impacts from refueling and lubrication activities in the construction area.

Refueling and lubricating of construction equipment will be restricted to upland areas at least 100 feet away from the edge of any streams, wetlands, ditches, and other waterbodies and 150 feet from water supply wells wherever possible. Wheeled and tracked construction equipment will be moved to an upland area more than 100 feet away from streams, wetlands, ditches, and other waterbodies for refueling and at the end of each work day. Fuel and service truck drivers will be responsible for spill prevention during fueling and service activities and drivers will be held responsible for observing and controlling fueling operations at all times to prevent overfilling.

Fuels and lubricants will be stored in designated areas and in appropriate service vehicles. Storage sites for fuels, other petroleum products, chemicals, and hazardous materials including wastes will be located in uplands. To prevent these materials and other contaminants from reaching waterways, no hazardous substances will be stored within 100 feet of streams and/or within 200 feet of groundwater wells (400 feet for public wells). The contractor will confirm with

the Environmental Inspector the locations of areas where these activities are prohibited prior to construction crews entering the area with equipment.

The contractor will maintain a minimum of 20 lbs. of suitable commercial absorbent and barrier materials at each contractor yard and on fuel and service trucks to allow rapid containment and recovery of a spill. Absorbent and barrier materials will also be utilized to contain runoff from spill areas. Fuel trucks will also be equipped with shovels and an assortment of hand tools to aid in the containment of a spill.

Equipment will not be washed in streams, wetlands, ditches, or other waterbodies. Equipment operators will be held responsible for prompt reporting and mitigation of any fuel or lubricant spills from their equipment.

3.3 RESTRICTED REFUELING AREAS

Restricted refueling areas include areas where the buffer zone for refueling activities (100 feet from a wetland or waterbody, 200 and 400 feet from private and public water wells, respectively) cannot be maintained. Potential situations where plans may be approved by the Environmental Inspector to allow refueling in restricted areas include extensive wetland crossings with limited access, continuous construction at stream/river crossings, and the required placement and operation of stationary equipment such as dewatering pumps, generators, and boring/drilling equipment. The requirement for any refueling and equipment service within restricted areas will be verified and approved by the Environmental Inspector prior to carrying out such activity.

3.3.1 Tracked Equipment

Only a fuel truck with a maximum of 300 gallons of fuel may enter restricted areas to refuel construction equipment. Two trained personnel will be present during refueling to reduce the potential for spills or accidents.

3.3.2 Stationary Equipment

Equipment such as large stationary pumps may be fitted with auxiliary tanks as appropriate. Such auxiliary tanks will be placed within a secondary containment structure. Refueling of dewatering pumps, generators, and other small portable equipment will be performed using approved containers with a maximum volume of 10 gallons. Non-empty fuel containers will be stored in an upland area at least 100 feet from wetlands and waterbodies.

3.4 VEHICLE AND EQUIPMENT MAINTENANCE

All vehicle and equipment maintenance on the project site involving fluid replacement will be conducted outside the boundary restrictions for wetlands, waterbodies, and water wells. Before lubricants are drained from the construction equipment, a suitable containment vessel and plastic sheeting will be placed under the equipment to collect any spilled material. The contractor will take necessary precautions to ensure that material that might accumulate on the liner does not spill on the ground surface. Vehicle maintenance wastes, including used oils and other fluids, will be handled and managed by personnel trained in the procedures outlined in this plan. Vehicle maintenance wastes will be stored and disposed of in accordance with applicable environmental regulations.

4. SPILL RESPONSE

In the event of a spill, the release will be contained and cleaned up as soon as possible. The order of priorities after discovering a spill are to protect the safety of personnel and the public, minimize damage to the environment, and control costs associated with cleanup and remediation. The initial response to an emergency will be to protect human health and safety, and then the environment. If a spill is not contained within a dike, an area of isolation will be established around the spill. The size of this area will depend on the size of the spill and the materials involved. The contractor will take precautions in the area of a spill to eliminate possible sources of ignition.

4.1 SPILL COORDINATOR

The contractor will appoint a Spill Coordinator who will be responsible for the reporting of spills, coordinating contractor personnel for spill cleanup, subsequent site investigations, and associated incident reports. The Spill Coordinator will report to the Environmental Inspector and may be removed from that role by CAW at CAW's discretion. In the event of a spill, the Spill Coordinator, along with the Environmental Inspector, will be responsible for determining the extent of the isolation area.

4.2 IMMEDIATE RESPONSE

All spills regardless of size must be reported to the spill coordinator and/or the CAW environmental inspector. The person observing the incident will take the following actions:

- Assess the safety of the situation (including the risk to the surrounding public).
- If safe to do so, make every effort to remove potential ignition sources and stop the source of the spill.
- Promptly notify the contractor's Spill Coordinator and/or CAW Environmental Inspector. Report your name, the spill location, and the extent of the incident.

Upon learning of the spill, the Spill Coordinator will implement the following measures:

- For an upland spill, if necessary, berms will be constructed with available equipment to physically contain the spill.
- Sorbent materials will be applied to the spill area. Contaminated soils and vegetation will be excavated and temporarily placed on and covered by plastic sheeting in a containment area a minimum of 100 feet away from any wetland or waterbody, until proper disposal is arranged.
- If a spill is beyond the scope of on-site equipment and personnel, an Emergency Response Contractor will be secured to further contain and clean up the spill.

4.3 WETLAND OR WATERBODY RESPONSE

Regardless of size, the following conditions apply if a spill occurs near or into a stream, wetland, or other waterbody:

- For spills in standing water, floating booms, skimmer pumps, and holding tanks will be used as appropriate by the contractor to recover and contain released materials on the surface of the water.

- For a spill threatening a waterbody, berms and/or trenches will be constructed to contain the spill before it reaches the waterbody. Deployment of booms, sorbent materials, and skimmers may be necessary if the spill reaches the water. The spilled product will be collected and the affected area cleaned up in accordance with appropriate state or federal regulations.

- Contaminated soils in wetlands must be excavated, and placed on and covered by plastic sheeting in approved containment areas a minimum of 100 feet away from the wetland or waterbody. Contaminated soil will be disposed of as soon as possible in accordance with appropriate state or federal regulations.

5. REPORTING

With assistance from the Environmental Inspector, the Spill Coordinator is responsible for the completion of the San Clemente Dam Seismic Retrofit Project Spill Report Form (Attachment C). Completion of this form will assist in the assessment of the spill and provide information necessary for agency notification. The form will be completed and submitted to the CAW representative within 24 hours of the occurrence. The CAW representative will also notify the appropriate agencies (see Section 6.0).

6. NOTIFICATIONS

In the event of an accidental release of a reportable quantity, CAW or its representative will notify the appropriate federal, state, and local agencies.

6.1 FEDERAL AND STATE AGENCIES

National Response Center (Washington, D.C.)
Phone: (800) 424-8802 (24 hours)

California Office of Emergency Services
Phone: (800) 852-7550 or (916) 262-1621

24-hour Warning Center
Phone: (916) 262-1621

Central Coast Regional Water Quality Control Board
(805) 549-3147

Attachment A: Response Team Contacts

SAN CLEMENTE DAM SEISMIC RETROFIT PROJECT
RESPONSE TEAM CONTACTS

NAME:

TITLE/POSITION: PHONE NUMBER:

CONSTRUCTION CONTRACTOR SPILL COORDINATOR:

ENVIRONMENTAL INSPECTOR:

AUTHORIZED ALTERNATE (Contact only if you are unable to reach the EI):

CONSTRUCTION CONTRACTOR SUPERINTENDENT:

CHIEF INSPECTOR:

OTHER SAN CLEMENTE DAM REPRESENTATIVES:

Attachment B: Typical Fuel, Lubricants, and Hazardous Materials

Typical Fuel, Lubricants, and Hazardous Materials

Fluid Uses	Fluids	Typical Quantity Per Site in Gallons	Method of Storage	Storage Location
Fuels	Diesel	5,000-10,000	Tanks or Tankers	Contractor Yard, Warehouse/fuel vehicle parking areas
	Gasoline	5,000-10,000	Tanks or Tankers, 10-Gallon Containers, or Pick-up Tanks	Contractor Yard, Warehouse/fuel vehicle parking areas
Lubricants	Engine Oil	<100	Bulk Storage or Retail Packaging	Contractor Yard Warehouse
	Transmission/ Drive Train Oil	<50	Retail Packaging on Service Trucks	Contractor Yard Warehouse, Service Trucks
	Hydraulic Oil	<100	Bulk Storage or Retail Packaging	Contractor Yard Warehouse, Service Trucks
	Gear Oil	<50	Retail Packaging on Service Trucks	Contractor Yard Warehouse, Service Trucks
	Lubricating Grease	<25	Tubes stored in Paper Cases	Contractor Yard Warehouse, Service Trucks
Misc./ Coolants, Hydraulic Fluids	Ethylene Glycol	<100	Bulk Storage or Retail Packaging	Contractor Yard Warehouse, Service Trucks
	Propylene Glycol	<100	Bulk Storage or Retail Packaging	Contractor Yard Warehouse, Service Trucks
	Power Steering Fluid	<50	Retail Packaging on Service Trucks	Contractor Yard Warehouse, Service Trucks
	Brake Fluid	<50	Retail Packaging on Service Trucks	Contractor Yard Warehouse, Service Trucks
	Propane	25-100	Pressurized Tanks	Contractor Yard Warehouse, Welding Trucks

Attachment C: Spill Report Form

SAN CLEMENTE DAM SEISMIC RETROFIT PROJECT
SPILL REPORT FORM

Date/time of spill: _____

Date/time of spill discovery: _____

Name and title of discoverer:_____

Milepost/Legal Description:
_____

Material spilled/Estimated volume:
_____

Unique qualifier, if relevant, such as manufacturer:
_____

Media in which the release exists: (circle: sand, silt, clay, upland, wetland, surface water, other):
_____

Topography and surface conditions of spill site:
_____

Proximity to wetlands and surface waters (including ditches):
_____

Proximity to private or public water supply wells:
_____

Directions from nearest community:
_____

Weather conditions at the time of release:
_____

Describe the causes and circumstances resulting in the spill:
_____
_____

Describe the extent of observed contamination, both horizontal and vertical (i.e., spill-stained soil in a 5-foot radius to a depth of 1 inch):
_____
_____
_____

Describe immediate spill control and/or cleanup methods used and implementation schedule:
_____
_____
_____

Location of any excavated/stockpiled contaminated soil:

_____

Describe the extent of spill-related injuries and remaining risk to human health and environment:

_____
_____
_____

Name, company, and telephone number of party causing spill (e.g., contractor):

_____
_____
_____

Current status of cleanup actions:

_____
_____

Name and company for the following:
Construction Superintendent:

_____

Spill Coordinator:

_____

Environmental Inspector:

_____

Chief Inspector:

_____

Landowner notified (if appropriate): _____

Date: _____

Form completed by:

_____

Date: _____

Government agency notified (to be completed by CAW or CAW's Representative):

_____

DATE: _____

Spill coordinator must complete this form for any spill, regardless of size, and submit the form to the CAW representative and environmental inspector within 24 hours of the occurrence.

Appendix S

*MEI STUDIES ON SEDIMENT SLUICING

***Additional Modeling studies to Evaluate Sediment Sluicing Options and Compare Downstream Sediment Concentrations include reports for March 2006 and August 2007 in response to comments from the Draft EIR/EIS.**

Evaluation of Sediment Sluicing Options Associated with the San Clemente Dam Fish Ladder

Prepared for
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Prepared By
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March 16, 2006

1. INTRODUCTION

The alternatives that are being considered to bring San Clemente Dam into compliance with California Division of Safety of Dams (DSOD) seismic safety standards include (1) thickening the existing approximately 80-foot high concrete arch dam (Dam Thickening Alternative), and (2) constructing a 19-foot deep notch in the dam that would to provide the necessary structural stability (Dam Notching Alternative). The existing reservoir is nearly filled with sediment; the most recent bathymetric surveys indicate that there is only about 100 ac-ft of available water storage, much of which is located in the San Clemente arm of the reservoir. Under the Dam Thickening Alternative, the water- and sediment-storage characteristics of the existing reservoir would remain essentially as they are today. Under the Dam Notching Alternative, the sediment above the elevation of the notch invert (Elevation 516) would be removed prior to constructing the notch to prevent unacceptable downstream sedimentation impacts.

Under both of these alternatives, a properly functioning fish ladder would be necessary to provide steelhead passage. The existing fish ladder at the dam, which was constructed in the 1920s, does not conform to current fish ladder criteria promulgated by the California Department of Fish and Game (CDFG) and the Southwest Region of NOAA Fisheries (NOAA-SWR) (FishPro and Entrix, 2003). FishPro and Entrix (2003) prepared a conceptual design for a new, vertical slot fish ladder for the Dam Thickening Alternative that would meet these criteria (**Figures 1 and 2**). To ensure that the ladder functions properly and that fish can pass through the dam into the upstream river, it will be necessary to maintain an open channel from the ladder inlet into the main river channel that crosses the surface of the upstream reservoir deposits. Because the invert of the proposed ladder is below the level of the sediment deposits, it is probable that sediment eroded from the upstream channel will be carried to the ladder, which could either block the entrance or pass into the ladder, affecting its hydraulic performance and effectiveness for fish passage. As a result, a sluice gate has been proposed that could be used to periodically flush sediment away from the ladder and provide flows and sediment transport capacity sufficient to maintain the desired open-channel conditions upstream from the dam.

Mussetter Engineering, Inc. (MEI) was retained by MWH Americas, Inc. (MWH) to assist the San Clemente Dam Seismic Retrofit EIS Team in identifying a reasonable configuration for the

sluice gate, and to evaluate the potential behavior of the sluice gate, fish ladder and upstream channel under a range of hydrologic conditions. Results from the evaluation will be used by the team to develop an operations plan for the sluice gate that will provide adequate passage for upstream migrating Steelhead, while minimizing sedimentation problems in the fish ladder.

2. SLUICE GATE CONFIGURATION

Several configurations were considered for the sluice gate with the objective of providing a gate-opening size that would be practical and economical to construct, but would still be of sufficient size to erode the channel upstream from the gate and fish ladder rapidly enough to achieve the sediment flushing needs within a relatively short period of operation (assumed for purposes of this study to be on the order of 8 to 24 hours). Based on guidance from MWH, it was concluded that a gated, circular outlet would be the most practical (Vik Iso-Ahola, personal communication, December 2005). MWH also indicated that gate diameters up to 15 feet could potentially be feasible, and a 20-foot diameter opening would probably be the absolute maximum size that could be used, although there is considerable uncertainty about the feasibility of the larger sizes.

The sluice gate would function by eroding sediment from the vicinity of the fish ladder and creating a channel that would be incised into the upstream reservoir deposits. As a result, the gate should be constructed as close as possible to the fish ladder, subject to structural considerations, and the invert would be set below the invert of the ladder inlet. Again, based on guidance from MWH engineers, it was concluded that the minimum acceptable distance between the ladder and sluice gate would be approximately one diameter of the gate (i.e., for a 10-foot diameter gate, the edge of the gate and edge of fish ladder would be minimum 10 feet apart.) For purposes of this analysis, it was assumed that the incised channel in the vicinity of the sluice gate opening would have a bottom width of approximately 10 feet, with sideslopes of about 15 degrees (3.73H:1V), which is consistent with the combination of saturated angle of repose for the relatively fine-grained, noncohesive sediment and the tendency for the bed in this area of the channel to widen once it reaches the baselevel provided by the sluice gate invert.

The hydraulic capacities of four possible sluice gate diameters (5, 10, 15, and 20 feet) were initially evaluated to identify the size that would be most likely to meet the objectives (**Figure 3**). Based on the assumed channel geometry, the gates were set at approximately 1.5, 3.0, 4.0, and 5.5 feet below the invert of the fish ladder inlet, respectively, for the four diameters. As indicated in Figure 3, the 5-foot diameter gate would have capacity of only about 125 cfs when the upstream water surface is at the top of the pipe and the total capacity at the point where flow would begin to spill over the principal spillway would be only about 225 cfs, assuming that the fish ladder is closed during sluicing operations. At flows greater than 125 cfs, the channel upstream from the sluice gate inlet would be increasingly affected by backwater with increasing discharge; thus, the range of effective sluicing discharges would be very small. The 5-foot diameter gate is, therefore, not viable.

For the 10-foot diameter gate, the top of the gate would be slightly above the invert of the principal spillway (**Figure 4**), and the capacity of the gate would be about 675 cfs when the head is sufficient for flow over the spillway. Because the head available to drive flow through the sluice gate rises very slowly with increasing discharge above this level, the potential for significantly larger flows through the sluice gate is limited. With a reservoir water-surface elevation of 527 feet (2 feet above the spillway invert), for example, the discharge through the sluice gate would be only 750 cfs and the discharge over the spillway would be about 1,250 cfs

(i.e., the total discharge in the river would be about 2,000 cfs). Based on the 41-year mean daily flow record from the CVSIM model that was used for the previous sediment-transport modeling studies (MEI, 2002 and 2003), flows equal or exceed 675 cfs about 6.2 percent of the time (about 11 days per year, on average) during the December 1 and May 31 fish passage period (FishPro and Entrix, 2003), and they equal or exceed 300 cfs about 15.8 percent of the time (about 28 days per year) during that period (**Figure 5**). (Mean daily flows of 2,000 cfs only occur about 1 percent of the time during the fish passage period.) Flows in the range of 300 to 700 cfs should be sufficient to cause substantial erosion of sediments that build up near the fish ladder entrance, and they occur relatively frequently; thus, the 10-foot diameter gate appears to have potential for an effective gate size.

With 15- and 20-foot diameter gates, the discharge through the gate would be about 1,255 and 1,950 cfs, respectively, when flow begins over the principal spillway. Mean daily flows equal or exceed these levels about 2.4 percent of the time (4 days per year) and about 1 percent of the time (1.9 days per year) during the fish passage period. While either diameter sluice gate could potentially be effective at flushing sediment from the fish ladder entrance, they would likely be very expensive to construct due to their large size.

Based on the above analysis, the potential behavior of the upstream channel with the 10-foot diameter sluice gate was evaluated in more detail, as described in the following sections.

3. SEDIMENT-TRANSPORT EVALUATION OF 10-FOOT DIAMETER SLUICE GATE

A simplified, one-dimensional sediment-transport model was developed to assess the aggradation/degradation characteristics of the channel that will develop in the reservoir deposits upstream from the sluice gate. One version of the model was used to evaluate the rate and longitudinal distance over which the upstream channel will develop, and the quantity of sediment delivered to the downstream river, under a range of potential sluicing discharges. For these analyses, it was assumed that the fish ladder would be closed during sluicing operations. A second version of the model was applied to assess the rate at which the incised channel would backfill (and, thus, the rate at which sediment would tend to build up near the fish ladder entrance), during subsequent periods when the sluice gate is closed and the fish ladder is operating. In addition, the sediment-transport capacity of the Carmel River downstream from the dam was compared with the amount of sediment delivered through the sluice gate at various discharges to assess the potential extent and duration of sediment deposition during sluicing operations.

3.1. Description of Modeling Approach

The sediment-transport model was developed by linking a sediment-routing and channel evolution algorithm with a 1-D hydraulic model in a manner that allows adjustment of the upstream channel geometry on a time-step by time-step basis. In general, the model functions by computing the hydraulic conditions for the initial channel configuration and sluice gate opening, computing the sediment transport capacity of the upstream channel using these hydraulic results, adjusting the upstream channel geometry based on the difference between the transport capacity and supply from the next upstream cross section, and then repeating the process for the duration of the simulation.

The Corps of Engineers (Corps) HEC-2 model was used for the hydraulic calculations (USACE, 1990) because it can be more easily linked to the sediment routing algorithms in an automated computer code than the HEC-RAS model that is currently used for most 1-D hydraulic calculations. Although HEC-2 is no longer supported by the Corps, it produces results that are comparable to the Windows-based HEC-RAS model for the conditions being analyzed here. The insure that the results are, in fact, comparable, several test runs were made in fixed-bed mode, and the results compared to those from a HEC-RAS model with identical geometry.

Sediment-transport capacities were estimated in the model using the Meyer-Peter, Müller bed-load equation (Meyer-Peter, Müller, 1948) linked to the Einstein integral for the suspended bed-material load (Einstein, 1950). This method has been used effectively in many previous studies (Vanoni, 1977; Simons, Li & Associates, Inc., 1982), and it is been shown to predict sediment-transport capacities that are within the correct range for the conditions being analyzed here (Mussetter et al., 1994). This method is also comparable to the MPM/Toffaleti relationship that was used in the previous modeling studies for the San Clemente Dam retrofit project (MEI, 2002 and 2003). Hydraulic information necessary to apply the sediment-transport equations was taken from the HEC-2 model results during each time-step in the simulation. A representative bed-material sediment gradation was developed by averaging the gradations for Zones 6, 7, and 8 from the stratigraphic profiles that were developed from the reservoir sediment characterization study that was performed for MEI (2003) (**Figure 6**). The representative gradation has a median (D_{50}) size of about 0.7 mm, it consists of about 85 percent sand and 15 percent medium to fine gravel, with maximum size of about 30 mm (**Figure 7**)

For the initial configuration, it was assumed that the front of the reservoir sediment deposits will have prograded essentially to the dam face, and a short section of incised channel immediately upstream from the sluice gate and fish ladder was assumed to provide initial numerical stability in the model. This channel had a trapezoidal shape with 10-foot bottom width and 3.73H:1V side slopes (Figure 4), and the longitudinal bed slope in the upstream direction was set at about 3.7H:1V (**Figure 8**). The initial-conditions cross sections, thus, rapidly become shallower and narrower in the upstream direction (**Figure 9**). To provide a reasonable approximation of the flow and sediment-transport conditions leading to the incised channel on the surface of the reservoir sediment deposits, a typical channel with a depth of about 2 feet, topwidth of about 25 feet and bed slope of 0.001, similar to the slope of the existing reservoir deposits, was assumed (Figure 7, XS5). It should be noted that the model results are very insensitive to the assumed configuration of the upstream, unincised channel because the transport capacity of the incised channel that develops during the sluicing operations is typically much higher than the inflowing sediment load.

The downstream control for the hydraulic model was established based on the rating curves that were discussed in the previous section (Figure 3), and channel encroachments were applied at the downstream cross sections to represent flow convergence into the sluice gate opening. Manning's *n*-values of 0.03 and 0.045 were used for the main channel and overbanks, respectively, to account for the energy loss characteristics of the incised and upstream channels.

During the incision process, the cross sections were adjusted to account for the estimated volume of erosion during each time-step by assuming a minimum bottom width of 10 feet and retaining the 3.7H:1V sideslopes; thus, the channel top width increases within increasing incision (**Figure 10**). For aggrading cross sections, it was assumed that the bottom of the channel would fill-in horizontally between the toe of the banks; thus, channel narrowing was not allowed under aggrading conditions.

3.2. Evaluation of Potential Sluicing Operations

The effects of sluicing operations were evaluated by making 10 separate simulations with constant discharges ranging from 100 and 1,000 cfs in 100-cfs increments. Each simulation was run for a 24-hour sluicing period, and the upstream channel profile and quantity of sediment delivered through the sluice gate were tracked on an hourly basis throughout the simulation.

The results indicate that the total quantity of sediment eroded from the reservoir and passed into the downstream river during the 24-hour sluicing period would range from about 1.8 ac-ft with a constant discharge of 800 cfs to about 9.9 ac-ft at a constant discharge of 400 cfs (**Figure 11**). The results also indicate that the maximum erosion (and thus, maximum potential sluicing of sediment from the vicinity of the fish ladder inlet) occurs in the range of flows between about 300 and 600 cfs. At lower discharges, the hydraulic conditions in the incising channel are favorable for sediment sluicing, but the amount of flushing is limited by the quantity of flow. At discharges above about 600 cfs, backwater caused by the limited capacity of the sluice gate reduces the hydraulic energy in the incising channel; thus limiting the sluicing potential. A similar relative relationship between the amount of sediment sluiced from the reservoir and the discharge occurs at other times during the simulation, but the total amount is obviously controlled by the length of time (**Figure 12**). During an 8-hour period, for example, about 4.5 ac-ft of sediment would be flushed from the reservoir at discharges in the range of 300 to 600 cfs, but only about 1 ac-ft would be removed at discharges in the range of 800 to 1,000 cfs.

The simulations indicate that the channel will incise very rapidly in the upstream direction early in the simulation, with the rate decreasing with time as the gradient of the incised channel decreases (**Figures 13 through 17**). The model results indicate that the upstream end of the incision would be about 1,600 feet upstream from the sluice gate after 8 hours at a constant discharge of 100 cfs, increasing to about 2,200 feet at 300 cfs and to about 2,900 feet at 500 cfs. At 800 cfs, the incision would be only about 320 feet upstream from the gate inlet after 2 hours, and it would remain at essentially this location due to the backwater effects described above. The ultimate control on the amount of incision in the area just upstream from the sluice gate inlet is controlled by the water-surface elevation at the inlet.

3.2.1. Impacts of Downstream River

The sediment sluicing operations will cause a short-term increase in the sediment load to the downstream river. The potential impact of the increased load was evaluated by initially comparing the rate at which the sediment will be delivered through the sluice gate for the various sluicing discharges with the transport capacity of the downstream river. To facilitate the comparison, transport capacity rating curves for the first two 0.5-mile segments of the river immediately downstream from the dam were developed based on reach-averaged hydraulic conditions predicted by the HEC-RAS model developed for MEI (2003) and the size-gradation of the eroded sediments (**Figure 18**). The model results indicate that the sediment outflow from the sluice gate will exceed the downstream transport capacity of the river by a factor of 2.5 to 3 during the early part of the sluicing operations at discharges up to about 600 cfs, but the river would be capable of transporting all of the delivered sediment at discharges above about 800 to 900 cfs (**Figure 19**). After 8 hours of sluicing, the sediment outflow from the sluice gate will decrease to substantially less than the transport capacity of the river at discharges above about

250 cfs. After 24 hours of sluicing, the sediment passing through the sluice gate will be less than the capacity of the river at all discharges greater than about 150 cfs.

To assess the potential for sediment accumulation in the 1-mile reach downstream from the dam, the sediment outflow from the sluice gate was compared to the transport capacity of the river on a time-step by time-step basis. The comparison indicates that worst-case conditions for a sluicing operation of 8 hours duration occur at a sluicing discharge of 200 cfs, where about 1.9 ac-ft of sediment would accumulate in the 0.5-mile reach downstream from the dam after about 8 hours (**Figure 20**). At this discharge, most of the sediment would be removed after about 16 hours as the sediment load from the sluice gate decreases to less than the capacity of the downstream river. The amount of sediment accumulation and the time required to transport it from the downstream reach decreases with increasing discharge.

For a 24-hour sluicing operation, worst-case conditions occur at a discharge of 100 cfs, where about 3.0 ac-ft of sediment would have accumulated the 0.5-mile reach downstream from the dam at the end of the sluicing period (**Figure 21**). If the discharge over the spillway remained at 100 cfs after the sluice gate is closed, most of the sediment would be moved through the reach over the next approximately 24-hour period. Similar to the 8-hour scenario, the maximum amount of sediment accumulation and the time required to move it through the downstream reach decreases with increasing discharge.

The rating curves in Figure 18 indicate that the transport capacity of the reach extending from about 0.5 to 1.0 miles downstream from the dam is somewhat higher than the reach immediately downstream from the dam; thus, significant sediment accumulation is not anticipated in this portion of the reach. It should be noted, however, that the sediment loads will increase during the period when the sluice gate is operating and the increased sediment load is being moved through the upstream reach. As a result, there will likely be increased amounts of sediment in low energy zones that occur on the downstream side of large boulders and other flow obstructions, and in eddy zones along the margins of the channel. This effect will also occur in reaches farther downstream, but the relative impact will decrease with increasing distance from the dam.

3.2.2. Depth and Velocity Profiles During Sluicing

Hydraulic conditions in the pool and incised channel upstream from the dam during the sluicing operations were evaluated to provide information that can be used to assess potential impacts to steelhead that are present in the area. The evaluation was performed by importing the modeled channel geometry in the reservoir after 2, 4, and 8 hours of sluicing at discharges of 300, 500, and 800 cfs into an HEC-RAS model and running to model to determine the cross-sectionally averaged velocities and maximum depths along the reach (**Figures 22 through 27**). Flow depths at the sluice gate inlet range from about 5.7 feet at a sluicing discharge of 300 cfs to about 11 feet at 800 cfs. In the incised reach, the flow depths range from 1.7 feet to about 3.4 feet at 300 cfs, from 2.2 feet to 4.5 feet at 500 cfs and from 2.5 to 11 feet at 800 cfs. In the reach upstream from the incision, the depths range from about 1.9 feet at 300 cfs to 2.7 feet at 800 cfs.

The velocity profiles (Figures 25 through 27) indicate the maximum velocity typically occurs near the inlet of the sluice gate, ranging from 6.3 fps (8 hours) to 7.3 fps (2 hours) at a sluicing discharge of 300 cfs, and 7.6 fps (4 hours and 8 hours) to 8.5 fps (2 hours) at 500-cfs simulation. The maximum velocity at 800 cfs is only about 3.7 fps due to the backwater conditions created by the hydraulic control at sluice gage inlet. At sluicing discharges of 300

and 500 cfs, the velocity generally decreases in the upstream direction through the incised portion of the channel. The locally high velocities indicated by the spikes in the velocity profiles occur at the downstream limit of the headcut, where the overbank flows in the less incised portions of the reach are drawn into the incised channel. Maximum velocities at these locations range from 5.2 fps (300-cfs simulation at 2 hours) to about 6 fps (500-cfs simulation at 2 hours). Under the 800-cfs simulation, relatively low velocities occur through the pool within 100 feet of the sluice gate inlet, with somewhat higher velocities in the range of 3.3 to 3.5 fps across the crest of the headcut.

3.3. Backfill Potential during Non-sluicing Periods

The potential rate at which the incised channel resulting from the sluicing operations will re-fill was evaluated by modifying the downstream boundary conditions in the hydraulic model to reflect the discharge capacity rating curve for the fish ladder rather than the rating curve for the sluice gate (Figure 3), and re-running the model for periods of up to 20 days duration for a range of discharges up to the capacity of the fish ladder. The incised channel after 8 hours of sluicing operations at 500 cfs was used as the initial channel geometry for these simulations. Results for the simulation with a discharge of 40 cfs passing through the fish ladder indicate that the front of the aggradation would prograde to near the fish ladder inlet in 5 to 6 days (**Figure 28**). The short duration over which this occurs is due, in part, to the relatively low water-surface elevation at the fish ladder inlet that allows continued incision at the head of the incised channel and transfer of the eroded sediment to the downstream end of the incised reach, even after the sluice gate is closed. At 60 cfs, flow would just begin to occur over the spillway, and the backwater would extend about 2,000 feet upstream in the incised channel (**Figure 29**). Under these conditions, the aggradation will prograde to near the fish ladder inlet within about 10 days. A total flow in the river of about 800 cfs would be required to pass 70 cfs through the fish ladder (Figure 3). Under these conditions, the reservoir water surface would be at about 526.7 feet, or about 1.7 feet above the crest of the principal spillway. Model simulations for these conditions indicate that a minimum of 15 to 20 days would be required for the sediment deposits in the incised channel to prograde to the vicinity of the fish ladder inlet.

4. SUMMARY AND RECOMMENDATIONS

A range of possible configurations for a sluice gate that could be used to flush sediment away from the inlet of the fish ladder that would be required under the Dam Thickening and Dam Notching Alternatives were evaluated to identify an appropriate configuration that would meet the sluicing objective, and would be practical and economical to construct. An initial evaluation of hydraulic capacities and the associated reservoir elevations indicates that a 10-foot diameter sluice gate with the invert about 3 feet below the invert of the fish ladder inlet would achieve this objective. A simplified sediment routing model was developed to analyze the behavior of the sluice gate over a range of possible sluicing discharges up to about 1,000 cfs . Results from the model indicate that a channel would rapidly incise into the upstream reservoir deposits at discharges up to about 800 cfs, and the incision would progress upstream at rates that depend on the total discharge in the river and the reservoir water-surface elevation. Other specific conclusions from the modeling include the following:

1. The rate of upstream progression of the incised channel depends on the discharge in the river, the hydraulic capacity of the sluice gate, and the resulting water-surface in the reservoir. For the discharges that were analyzed, the most rapid upstream progression occurs at about 500 cfs. At this discharge, the upstream end of the incision would be

located about 2,000 feet upstream from the dam after about 4 hours, about 2,900 feet upstream in 8 hours and about 1 mile upstream after 24 hours of sluicing operations. The incision rates are slower at lower discharges because they are limited by the amount of water that is available to move the sediment. The rates also decrease at higher discharges because of the backwater effects caused by the increasing water-surface elevation in the reservoir.

2. Based on the total quantity of the sediment that could be eroded from the reservoir, and thus the amount that would be evacuated from the channel feeding to the fish ladder over various durations of sluicing operations, the most effective range of sluicing discharges for the 10-foot diameter sluice gate is in the range of 300 to 600 cfs. For the reasons described in the previous item, the erosion potential diminishes rapidly at both higher and lower discharges. In the optimum range of discharges, about 4.5 ac-ft of sediment could be eroded over an 8-hour sluicing period, increasing to 9.5 to 10 ac-ft over a 24-hour period.

3. Based on the 41-year record of mean daily flows from the CVSIM modeling that was used in the previous sediment routing studies (MEI, 2003 and 2003), the optimum range of sluicing discharges occurs for 7 to 16 percent of the time, on average, during the fish passage period that generally extends from December 1 through May 31. This duration equates to about 11 to 28 days, during the 180-day period, on average. Of course, in wet years, this range of flows may occur for substantially longer periods of time and in dry years, it may occur for substantially shorter periods of time.

4. The sediment eroded from the reservoir will cause a temporary increase in the downstream sediment loads, and for the range of potential sluicing discharges up to 500 to 600 cfs, the sediment will temporarily accumulate in the reach immediately downstream from the dam. This sediment will typically be in the sand and fine gravel-size range; thus, the river will be capable of re-entraining and transporting the material farther downstream relatively rapidly. Of the sluicing discharges that were considered in the analysis, worst-case conditions for downstream sediment accumulation occur at 200 cfs for an 8-hour sluicing operation and at 100 cfs for a 24-hour operation. For the 8-hour operation, about 1.9 ac-ft of sediment will have accumulated in the approximately 0.5-mile reach downstream from the dam after 8 hours, and most of the accumulated sediment would be re-entrained and moved downstream within about 16 hours. For a 24-hour operation, about 3 ac-ft of sediment would accumulate in this reach and most of this sediment would be re-entrained and removed from the reach after an additional 24 hours.

5. The results described in the previous item are based on the assumption that the indicated sluicing discharge would continue to pass over the principal spillway for the amount of time necessary to remove any accumulated sediment from the stilling pool at the base of the dam. As a result, flows into the fish ladder should be limited through this period to insure that most of the flow passes over the spillway, because discharges from the fish ladder enter the river downstream from the stilling pool.

6. The sluicing operations will cause a temporary increase in sediment loads in the downstream river, with the magnitude of the effects diminishing with increasing distance downstream from the dam due to the effects of both temporary and more permanent storage of the relatively fine-grained sediment in eddy zones and other low energy areas along the reach.

7. The estimated baseline sediment yield to San Clemente Reservoir averages about 16.5 ac-ft per year, and results from the baseline conditions modeling from the previous analysis indicate that an average of about 12.2 ac-ft of sediment would pass over the dam

during the 41-year simulation period under the Dam Thickening Alternative (**Figure 30**, MEI, 2003 and 2005). The maximum sediment load from the sluicing operations of about 9.5 to 10 ac-ft over a 24-hour period, therefore, represents about 60 percent of the annual sediment load to the downstream river under the Complete Dam Removal Alternative, and about 80 percent of the average annual load under the Dam Thickening Alternative. Although the initial incision into the reservoir deposits during sluicing operations will cause a temporary increase in the total sediment load to the downstream river, the total load passing the dam over the long-term will be similar to that under the Complete Dam Removal Alternative, because the incised channel will store sediment during intervening periods when the sluice gate is closed.

8. Evaluation of the rate at which the incised channel will refill after the sluice gate is closed at the end of each sluicing period indicates that at relatively low discharges in the range of 30 to 50 cfs, the sediment deposits may prograde to near the fish ladder inlet within 5 to 7 days. This relatively rapid rate of refilling occurs because the downstream hydraulic control is lower than the channel bed at the head of the incision; thus, erosion will continue in this area with the sediment being transferred into the deposition zone closer to the dam. When the discharge through the fish ladder is in the range of 60 cfs, the sediment will prograde to near the inlet in about 10 days after the end of sluicing. A total discharge of 750 to 800 cfs is required to provide sufficient head to pass 70 cfs through the fish ladder. Under these conditions, the reservoir water-surface elevation is sufficient to slow the advance of the depositional wedge. Under these conditions, the deposition will reach the vicinity of the fish ladder inlet after a minimum of 15 to 20 days.

9. The results in the previous item represent conditions after the first few sluicing operations. After repeated operations, the incision will likely progress even farther upstream than is indicated by the analysis presented here, which should increase the time before sediment begins to affect the fish ladder during non-sluicing periods. Controlling the amount of flow into the fish ladder to maintain the reservoir level as high as possible would also lengthen the time between sluicing operations because of the increased effects of the backwater upstream from the dam.

10. The quantitative analyses that were performed for this study focused on conditions for the Dam Thickening Alternative. Similar results would be obtained for the Dam Notching Alternative. The sediment deposits at the lower level of the notch are somewhat finer than those at the surface; thus, the transport rates through the sluice gate would be somewhat higher and the incision would occur at a faster rate. This would remove more sediment from the upstream channel, increasing the area available for sediment deposition during the intervening periods between sluicing operations, but also increasing the sediment load to the downstream river. Because the eroded sediment will be finer, it will also be transported through the downstream reaches at a faster rate, limiting the potential for accumulation.

11. The analyses performed for this study considered only one of many possible invert elevations for the sluice gate. While the selected elevation is believed to be appropriate, other invert elevations should be evaluated during the design process to determine if they would provide more effective sluicing if the Dam Thickening or Dam Notching Alternatives is ultimately implemented.

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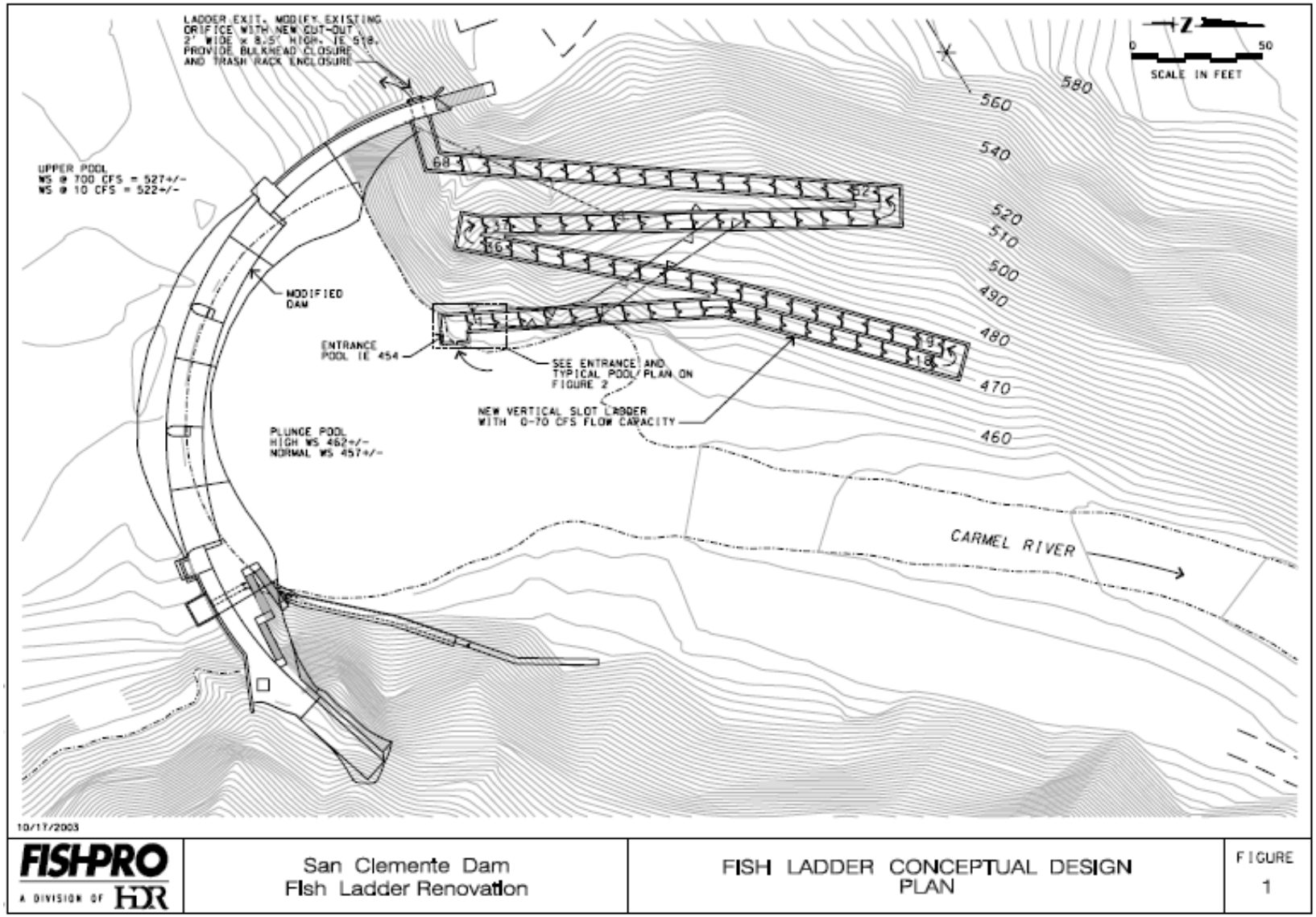


Figure 1. Fish ladder conceptual design, plan view of spillway and ladder exit (Figure 1 from FishPro and Entrix, 2003).

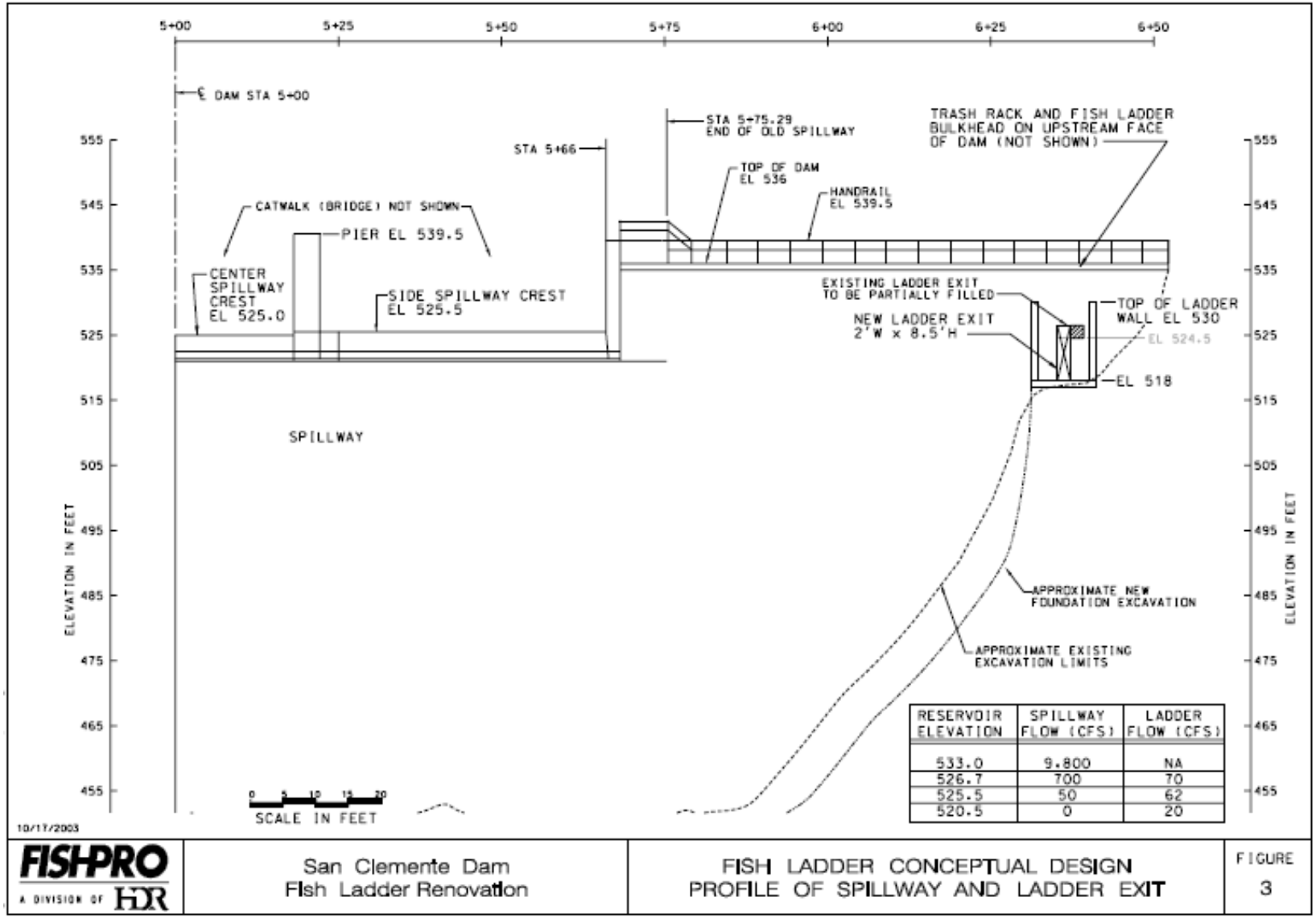


Figure 2. Fish ladder conceptual design, profile of spillway and ladder exit (Figure 3 from FishPro and Entrix, 2003).

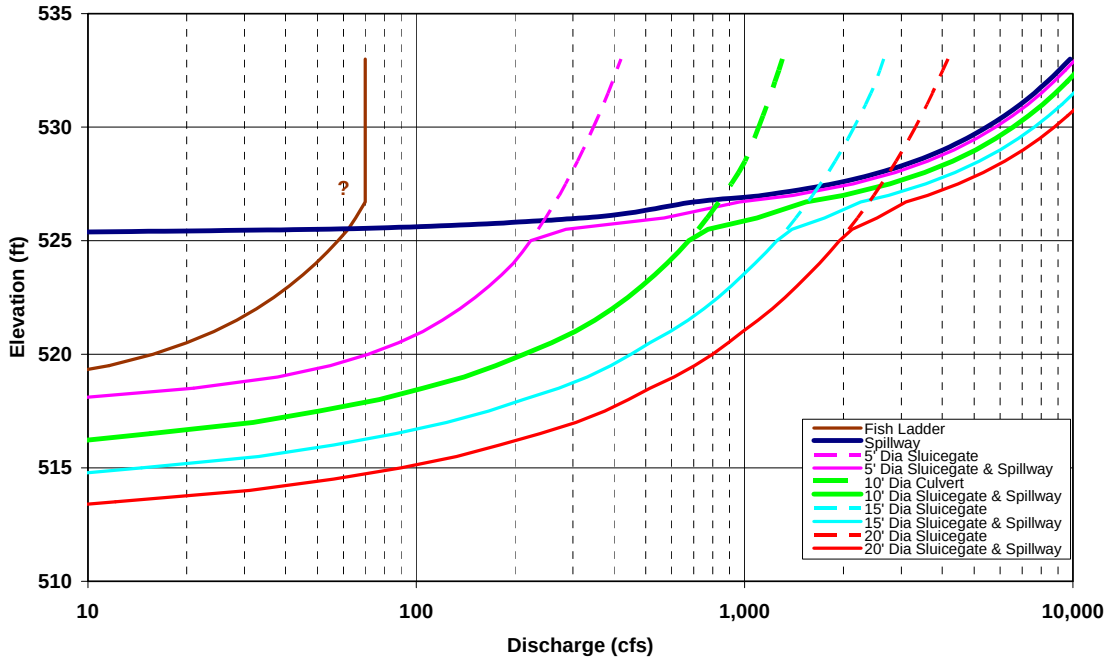


Figure 3. Hydraulic capacity rating curves for four potential sluice gate diameters (5, 10, 15, and 20 feet) and the principal spillway for the Dam Thickening Alternative. The hydraulic capacity rating curve for the fish ladder FishPro and Entrix (2003) is also shown.

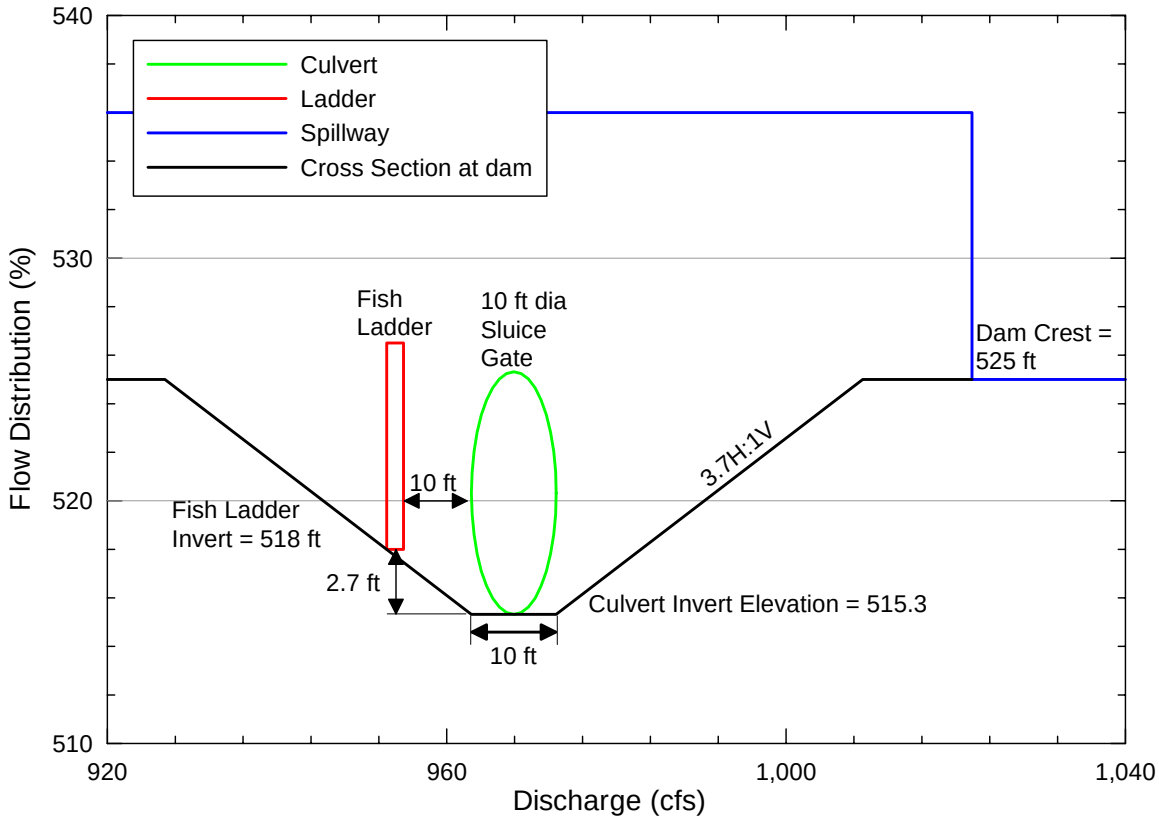


Figure 4. Conceptual sketch, looking downstream, of San Clemente Dam, the vertical slot fish ladder proposed by FishPro and Entrix (2003) and a 10-foot diameter sluice gate. Also shown is the approximate cross section of the channel upstream from the sluice gate when it has incised to the level of the sluice gate invert.

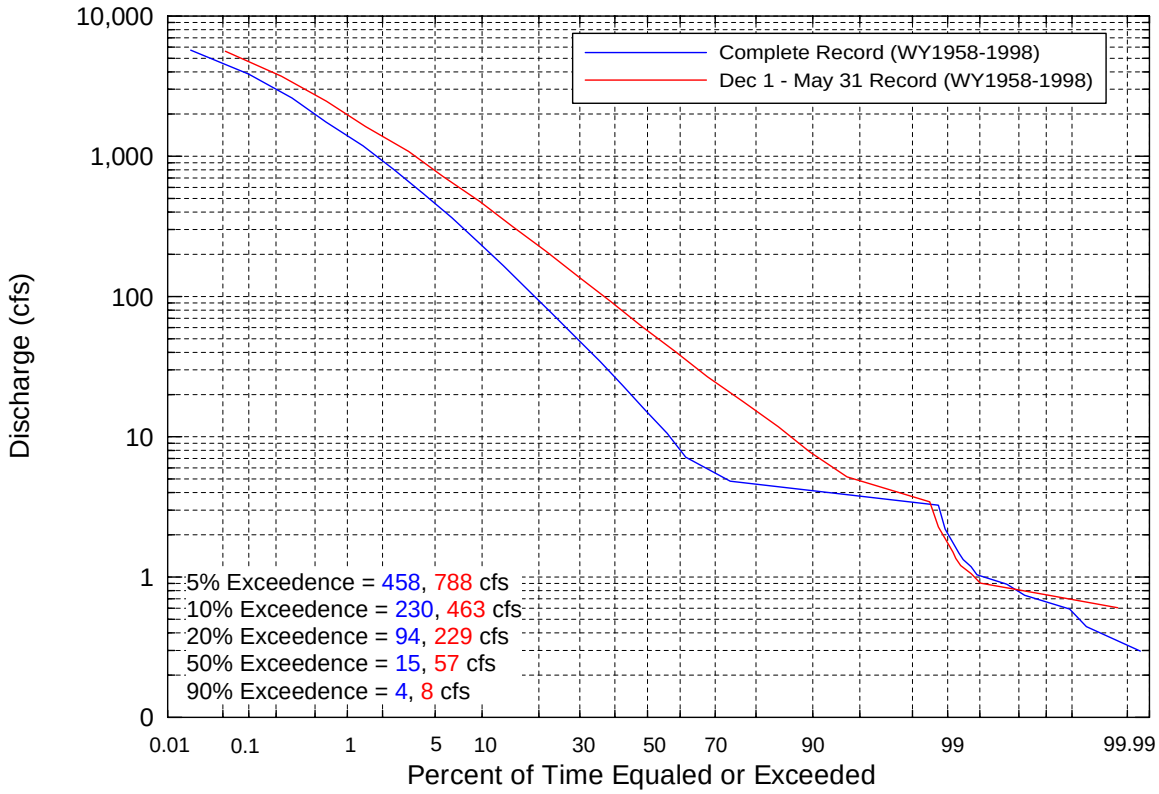


Figure 5. Mean daily flow-duration curve for the combined flows in the Carmel River and San Clemente Creek at San Clemente Dam for the full year and for the December 1 through May 31 fish-passage period, based on the CVSIM model results that were used to develop the 41-year period of record that was used in the previous sediment modeling studies (MEI, 2002 and 2003).

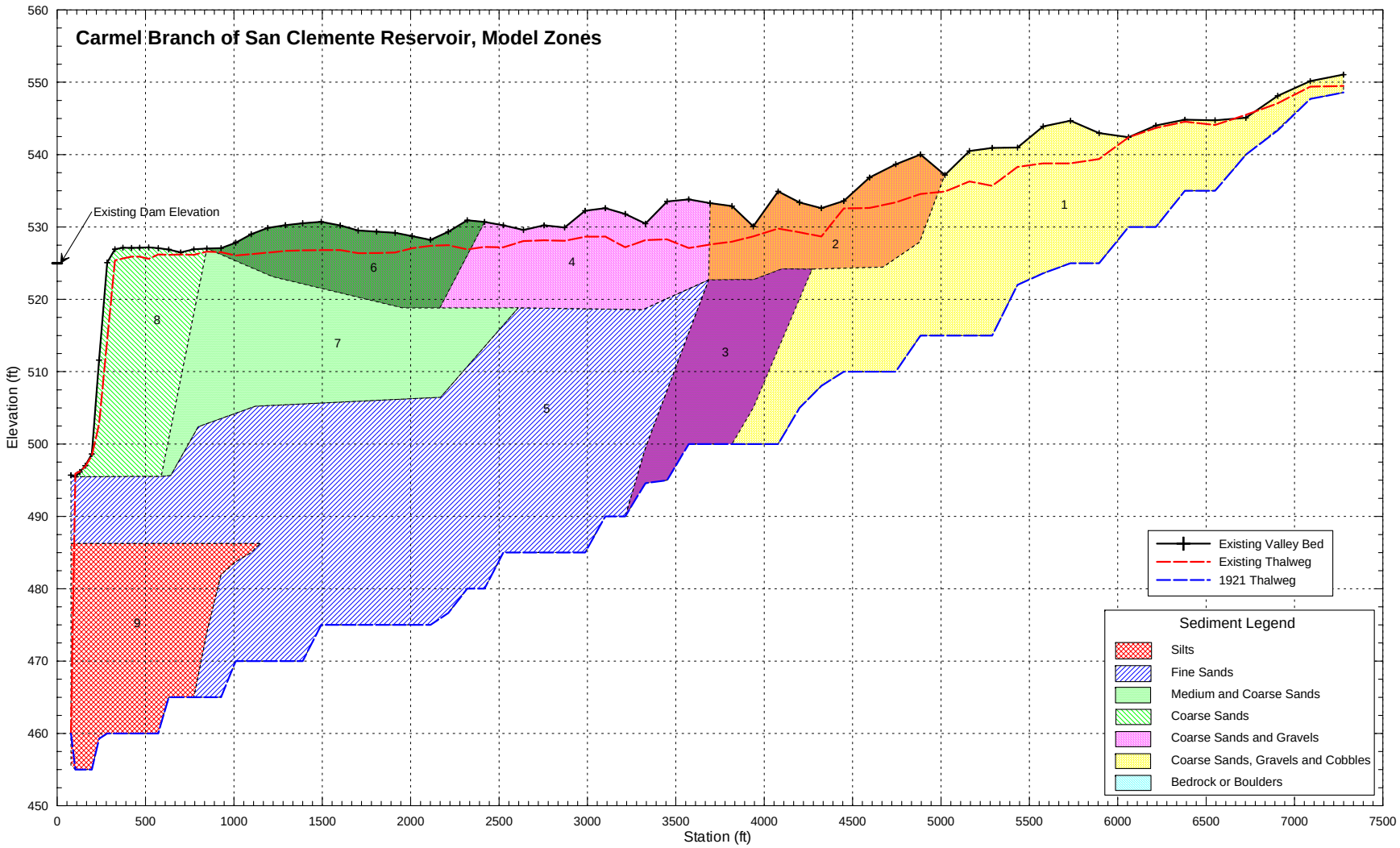


Figure 6. Simplified stratigraphic profile of the Carmel River Branch of the reservoir (from MEI, 2003).

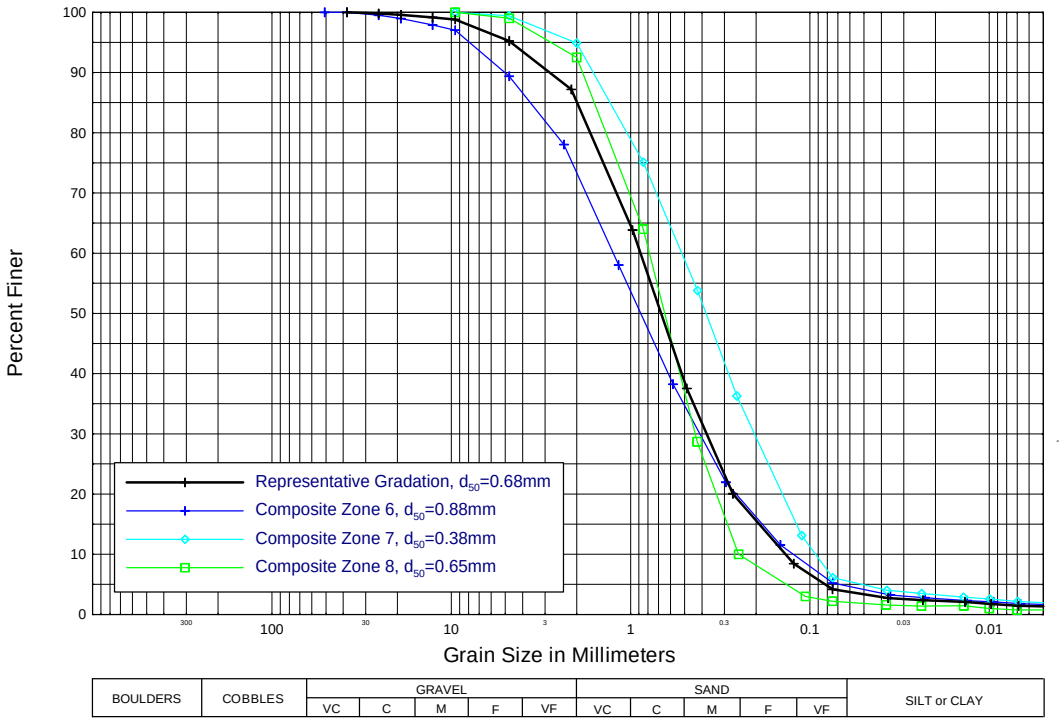


Figure 7. Representative sediment gradation for the sluicing analysis developed from the weighted average of Composite Zones 6, 7 and 8 shown in Figure 6.

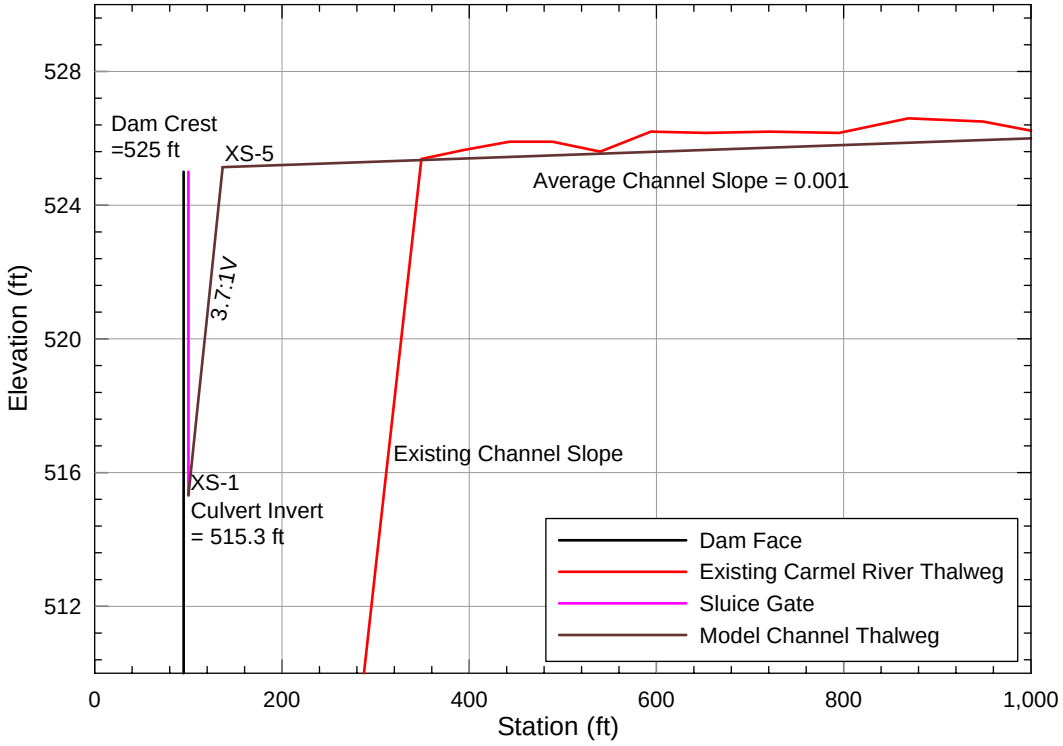


Figure 8. Longitudinal profile of the incised channel and reservoir sediment deposits that was assumed for the initial model conditions. Also shown for reference purposes is the profile of the existing reservoir deposits.

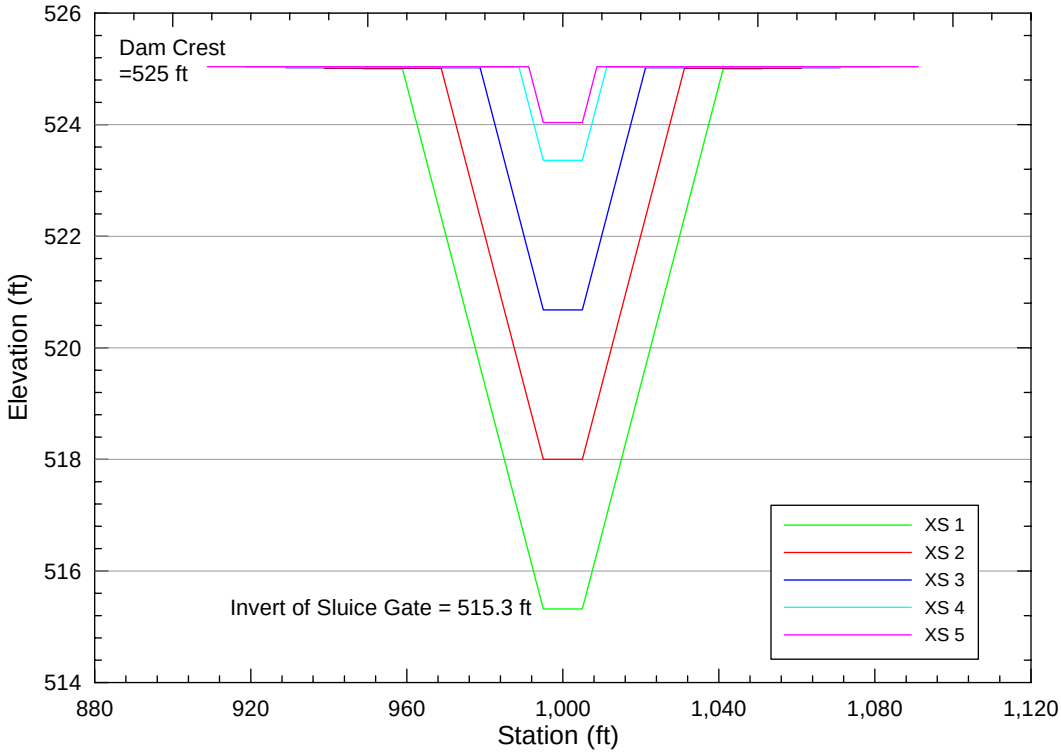


Figure 9. Geometry of initial cross sections immediately upstream from the sluice gate.

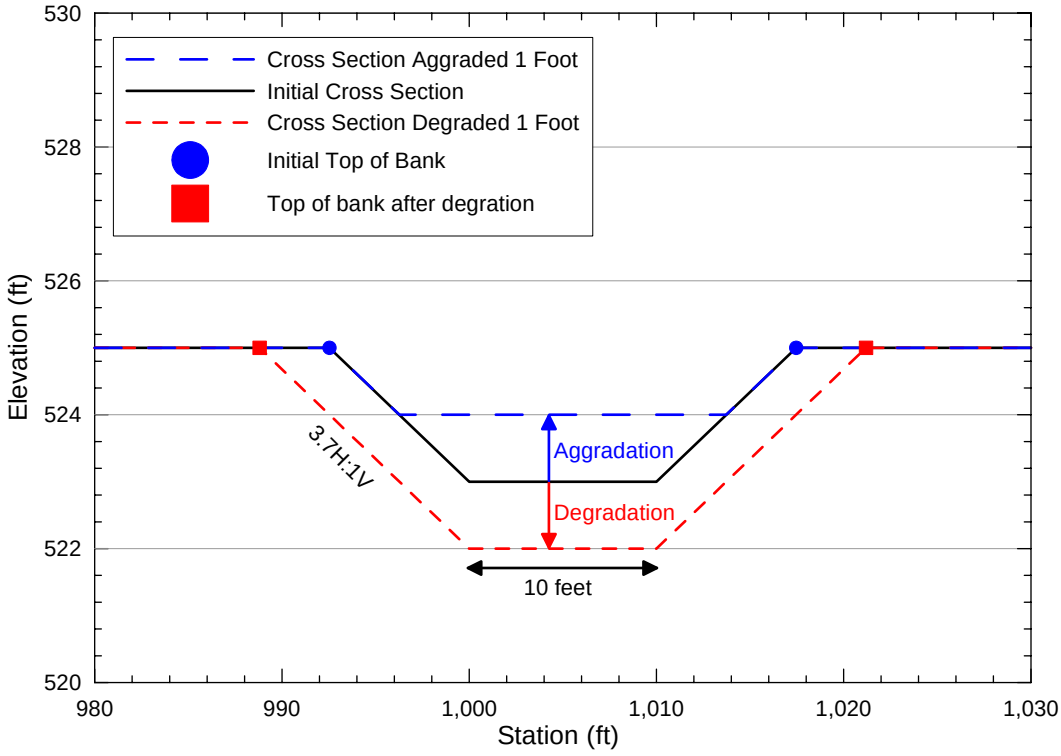


Figure 10. Conceptual sketch of channel modifications that were applied in the model during degradation and aggradation.

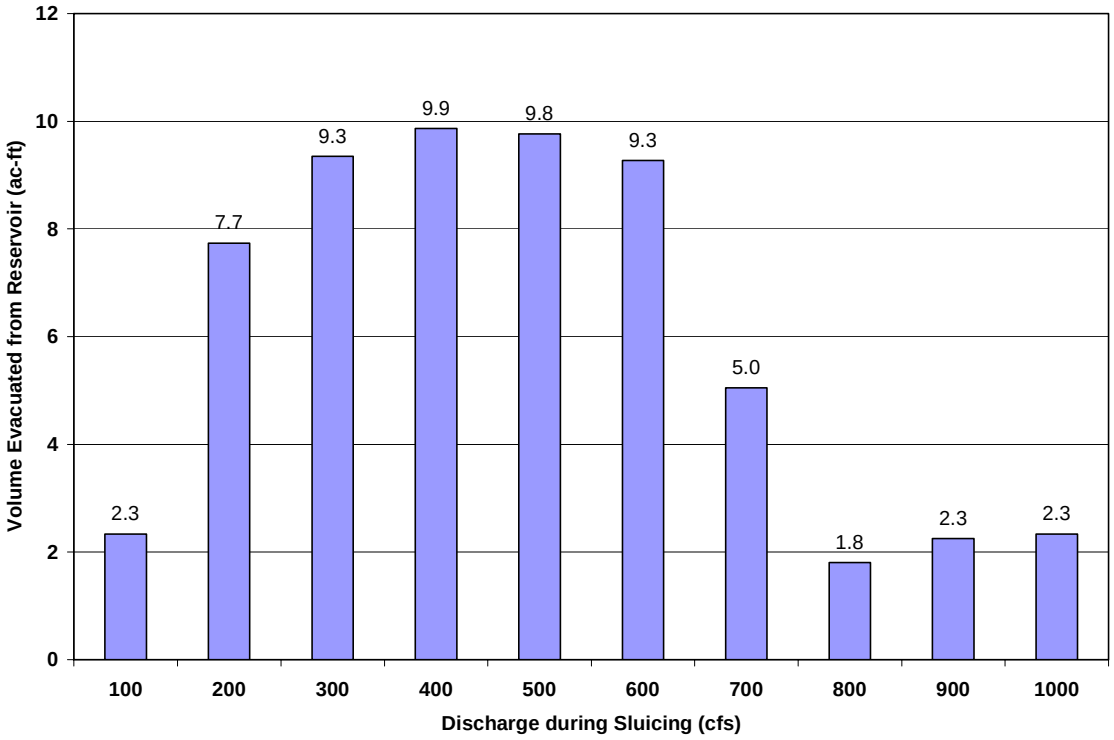


Figure 11. Total volume of sediment eroded from the reservoir deposits and passed into the downstream river after 24 hours at constant discharges ranging from 100 to 1,000 cfs.

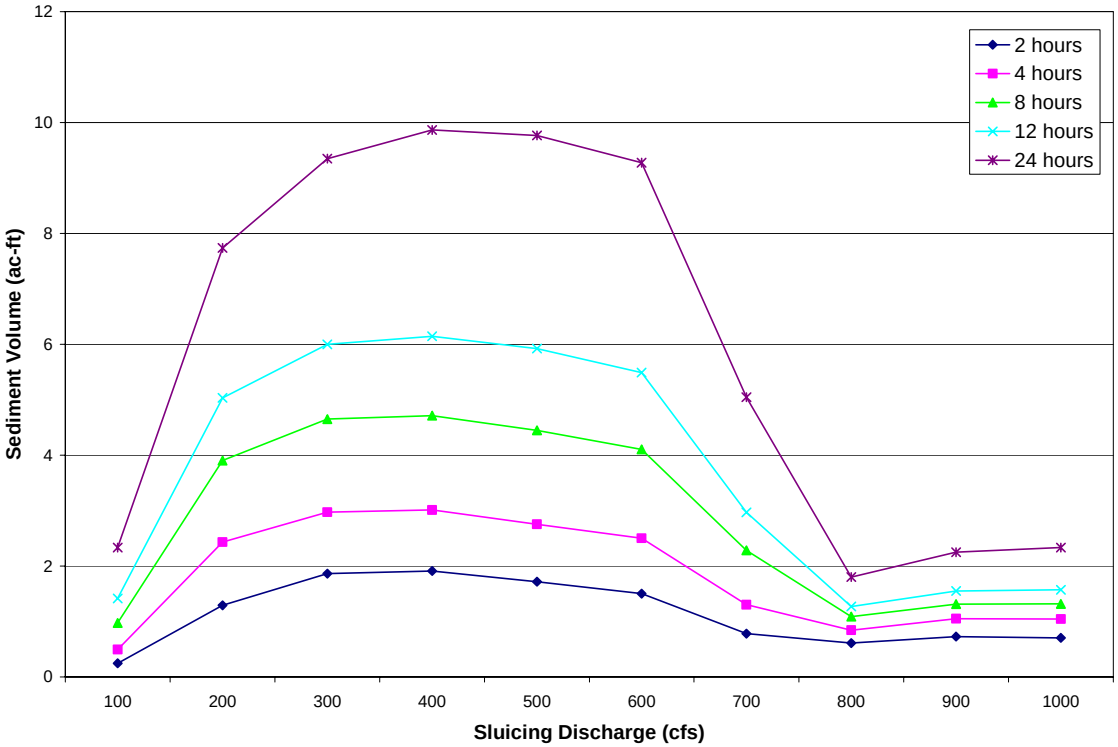


Figure 12. Volume of sediment delivered to the downstream river at constant discharge ranging from 100 to 1,000 cfs over sluicing durations of 2, 4, 8, 12, and 24 hours.

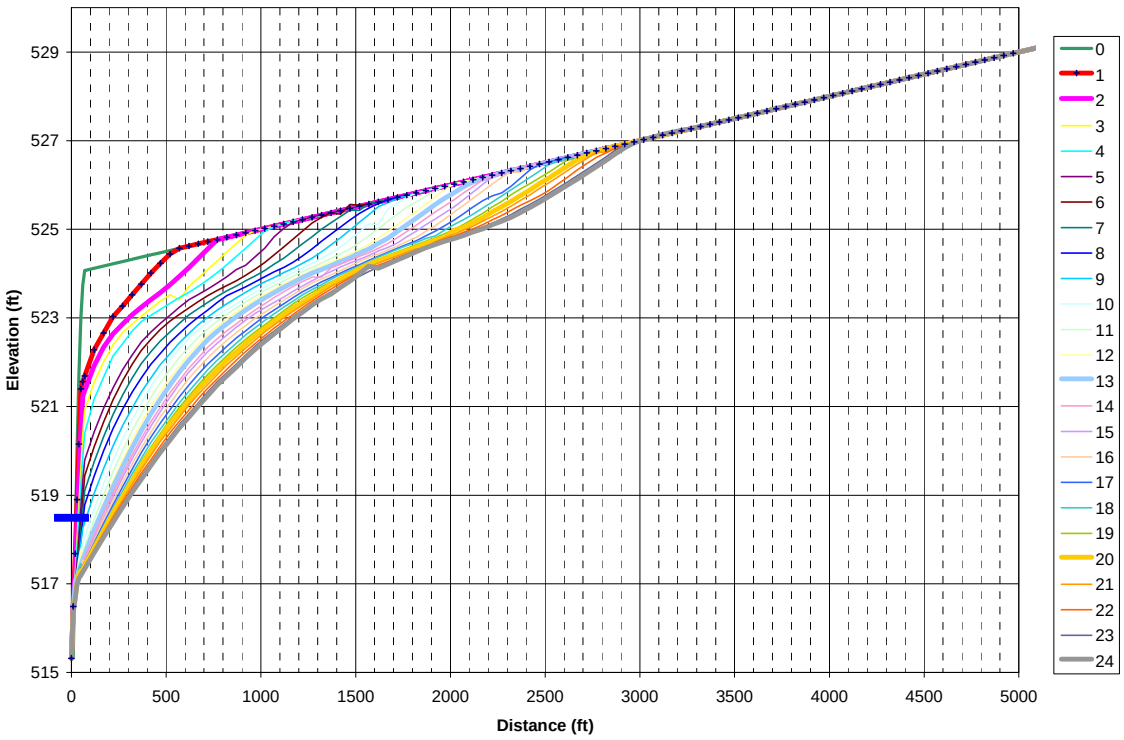


Figure 13. Estimated longitudinal profiles of the incised channel upstream from the sluice gate in 1-hour increments at a constant sluicing discharge of 100 cfs. Blue mark is water-surface elevation at sluice gate inlet.

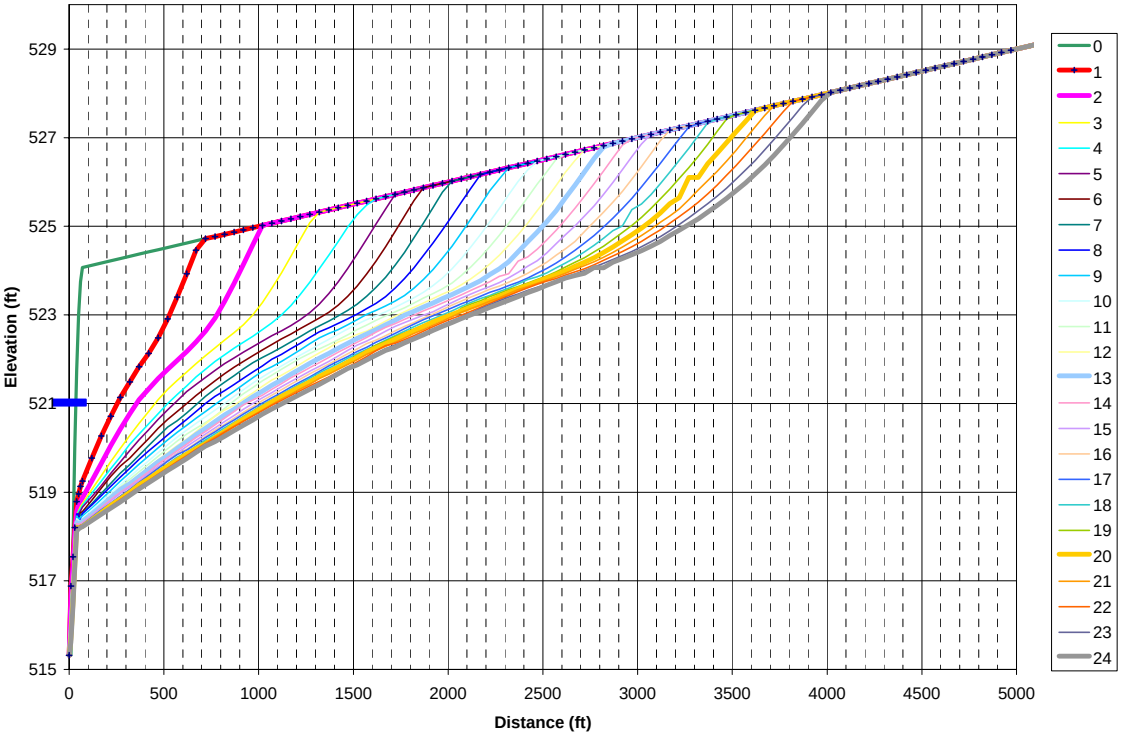


Figure 14. Estimated longitudinal profiles of the incised channel upstream from the sluice gate in 1-hour increments at a constant sluicing discharge of 300 cfs. Blue mark is water-surface elevation at sluice gate inlet.

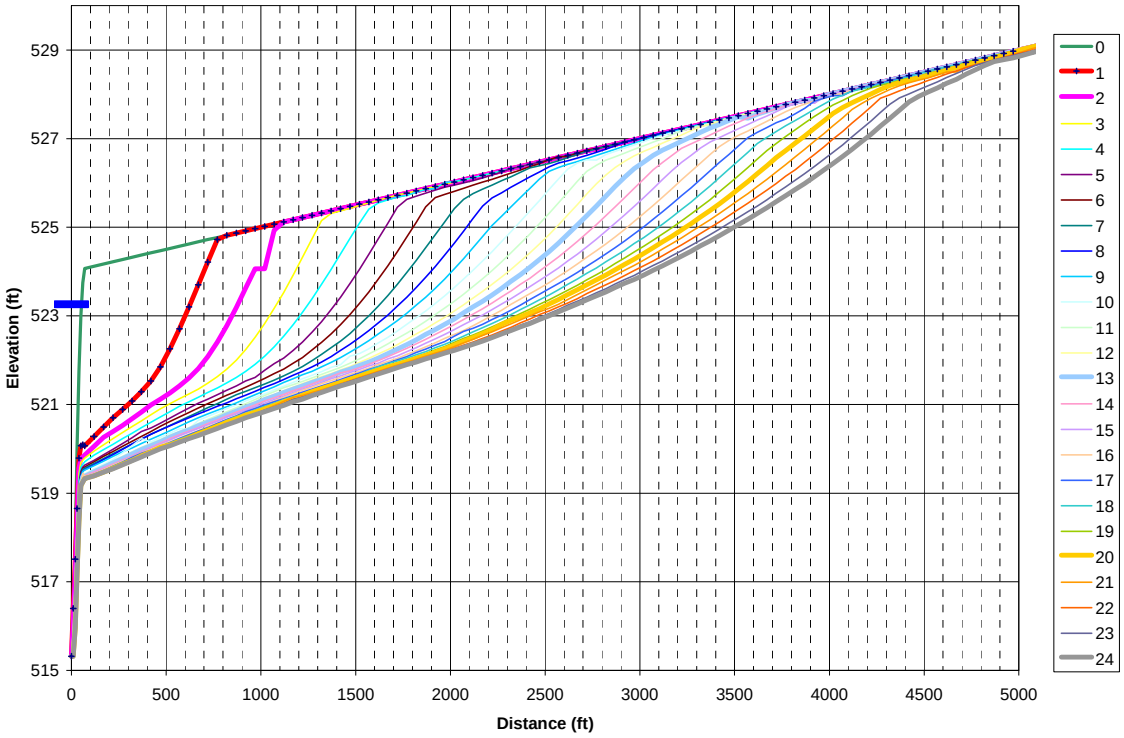


Figure 15. Estimated longitudinal profiles of the incised channel upstream from the sluice gate in 1-hour increments at a constant sluicing discharge of 500 cfs. Blue mark is water-surface elevation at sluice gate inlet.

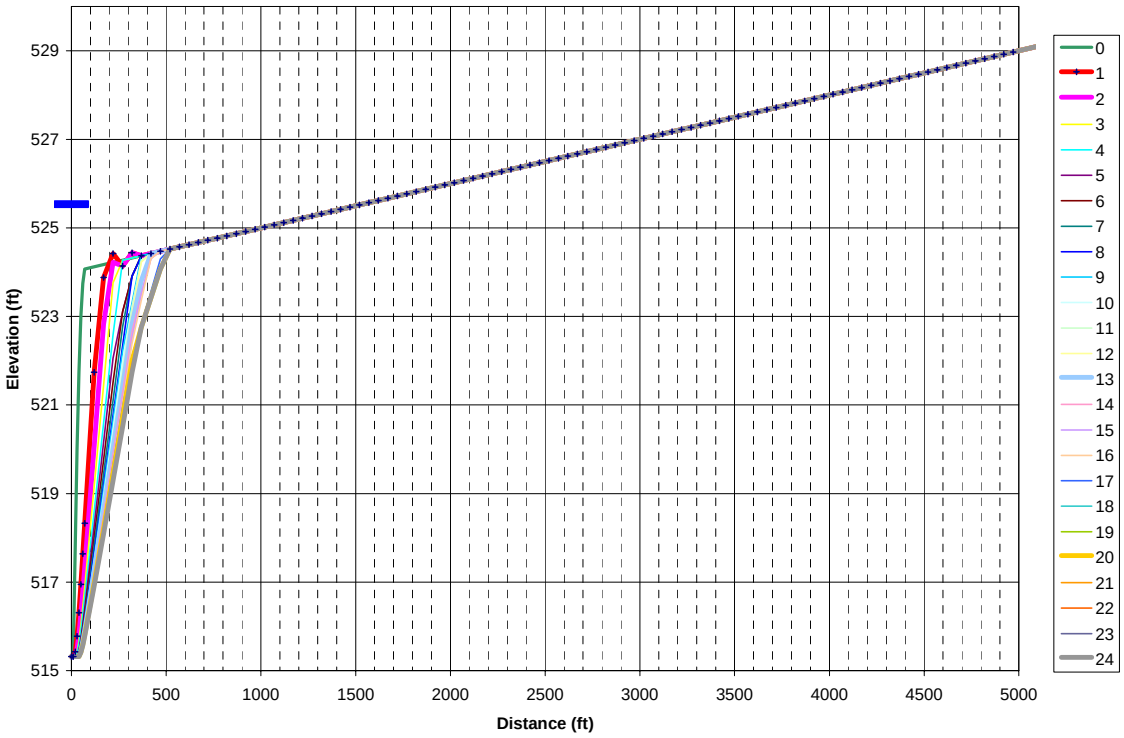


Figure 16. Estimated longitudinal profiles of the incised channel upstream from the sluice gate in 1-hour increments at a constant sluicing discharge of 800 cfs. Blue mark is water-surface elevation at sluice gate inlet.

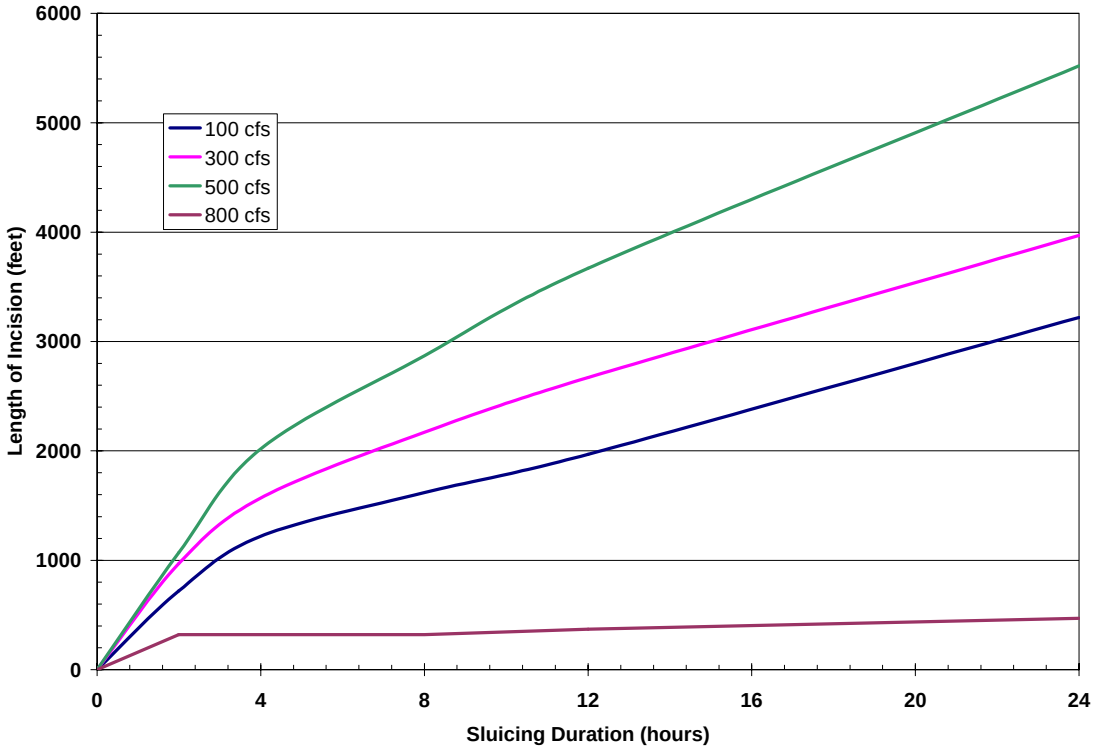


Figure 17. Estimated length of the incision upstream from the sluice gate at various points in the simulation at constant sluicing discharges of 100, 300, 500 and 800 cfs.

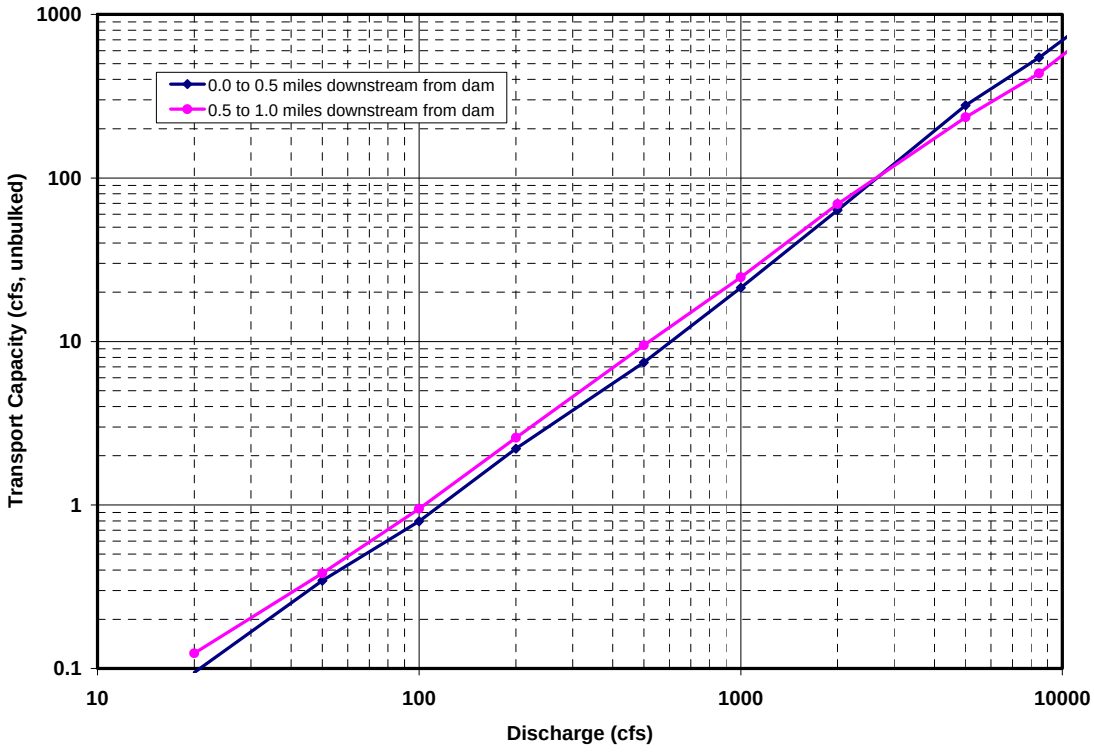


Figure 18. Sediment-transport capacity rating curves for the first two 0.5-mile segments of the Carmel River downstream from San Clemente Dam.

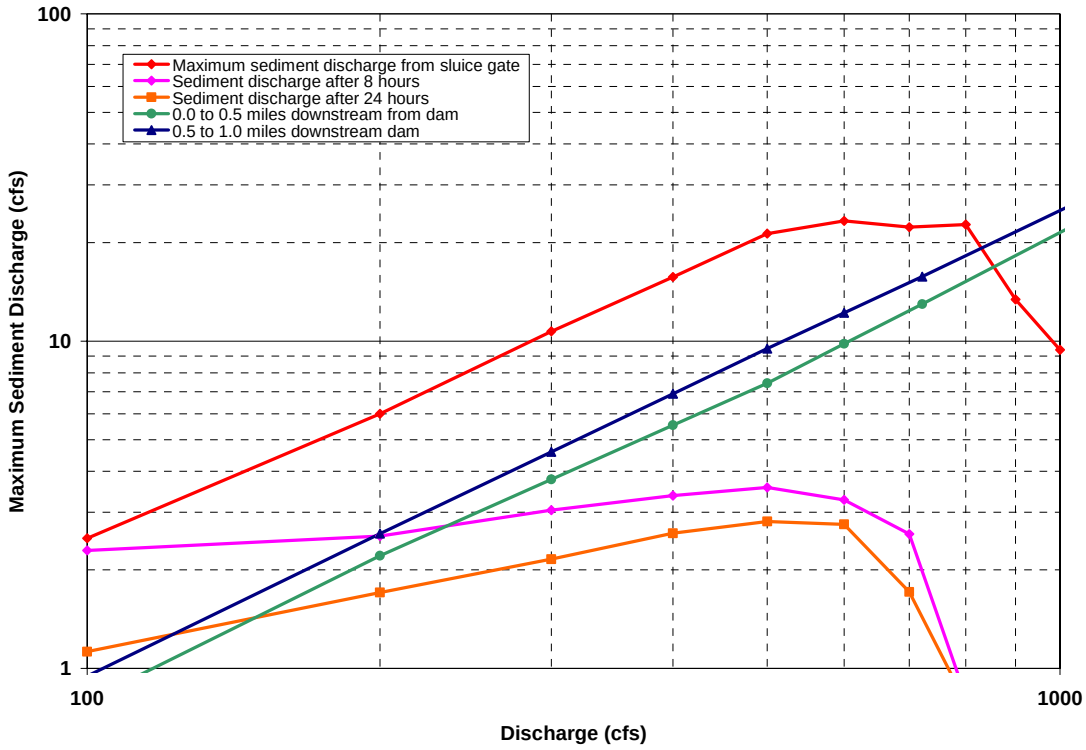


Figure 19. Sediment discharge passing through the sluice gate near the beginning of sluicing operations (maximum discharge curve), after 8 hours and after 24 hours of sluicing. Also shown are the transport capacity rating curves for the two 0.5-mile segments of river immediately downstream from the dam.

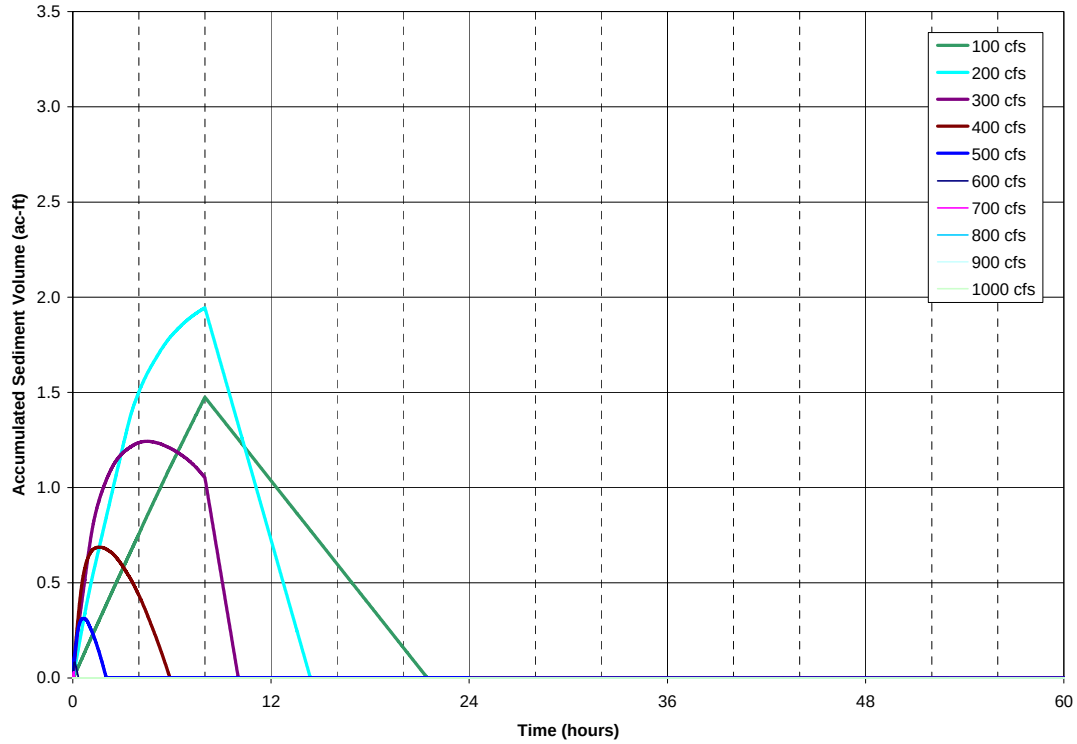


Figure 20. Volume of sediment accumulated in the 0.5-mile reach of the Carmel River immediately downstream from the dam for an 8-hour sluicing operation at discharges ranging from 100 to 1,000 cfs.

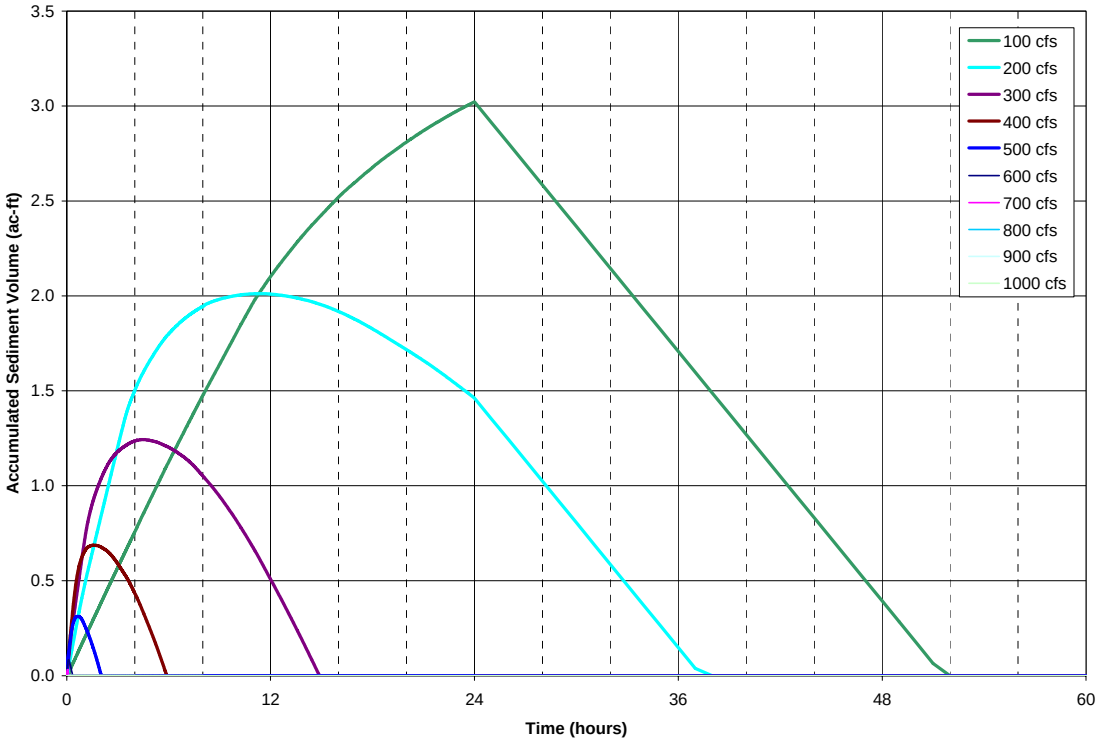


Figure 21. Volume of sediment accumulated in the 0.5-mile reach of the Carmel River immediately downstream from the dam for a 24-hour sluicing operation at discharges ranging from 100 to 1,000 cfs.

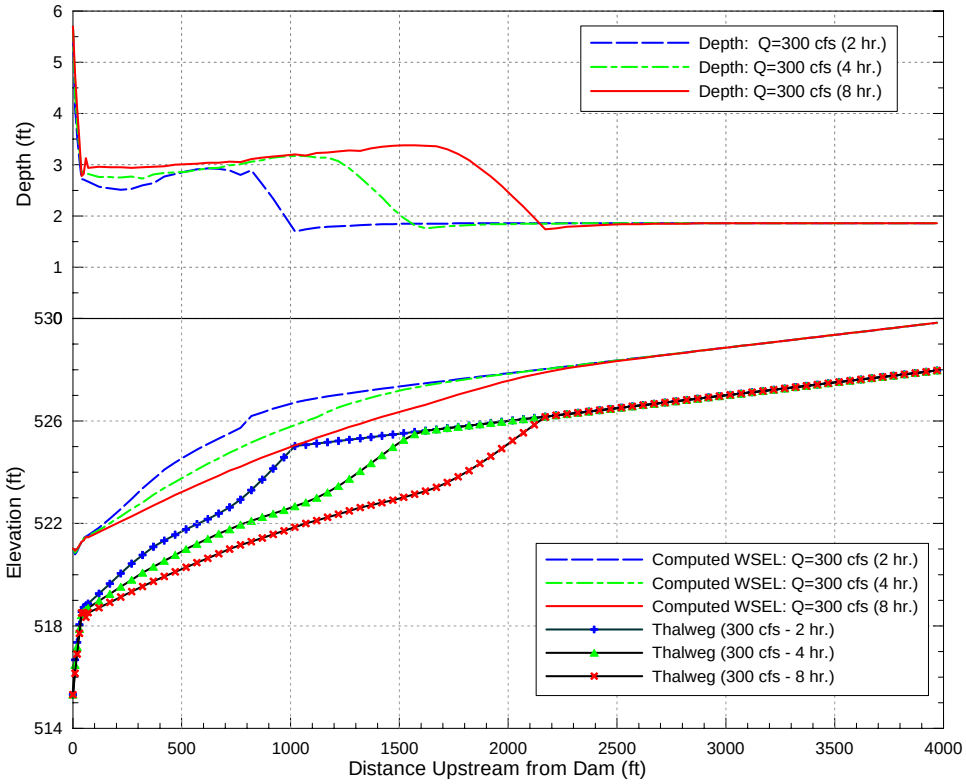


Figure 22. Simulated minimum bed elevation, water-surface elevation and maximum depth profiles at 2, 4, and 8 hours for a constant sluicing discharge of 300 cfs.

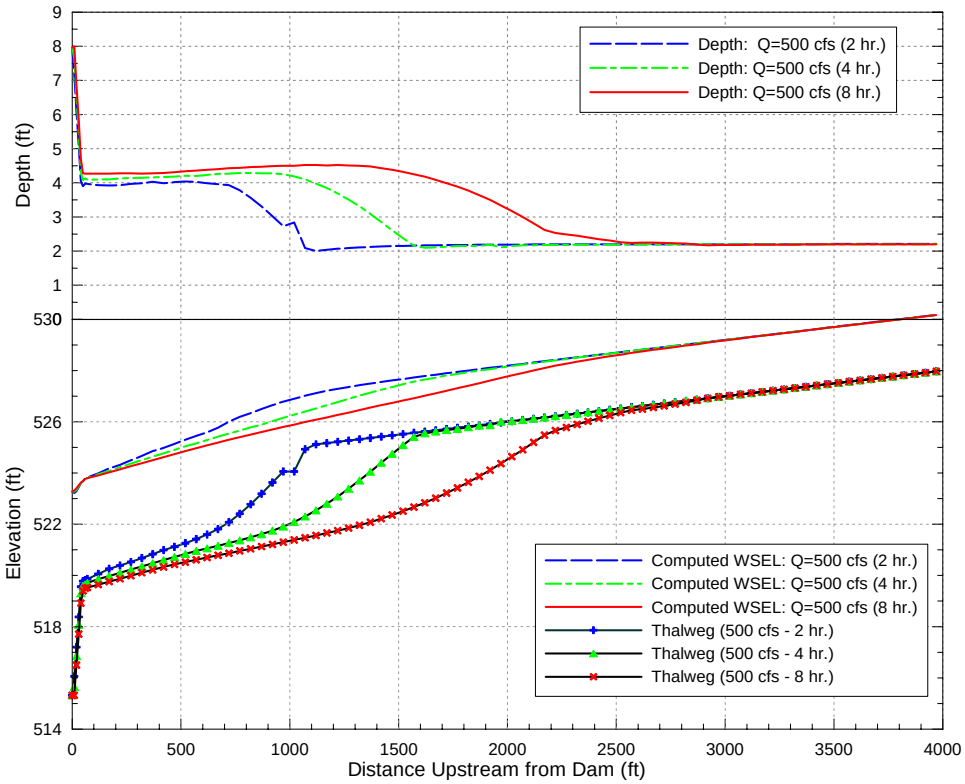


Figure 23. Simulated minimum bed elevation, water-surface elevation and maximum depth profiles at 2, 4, and 8 hours for a constant sluicing discharge of 500 cfs.

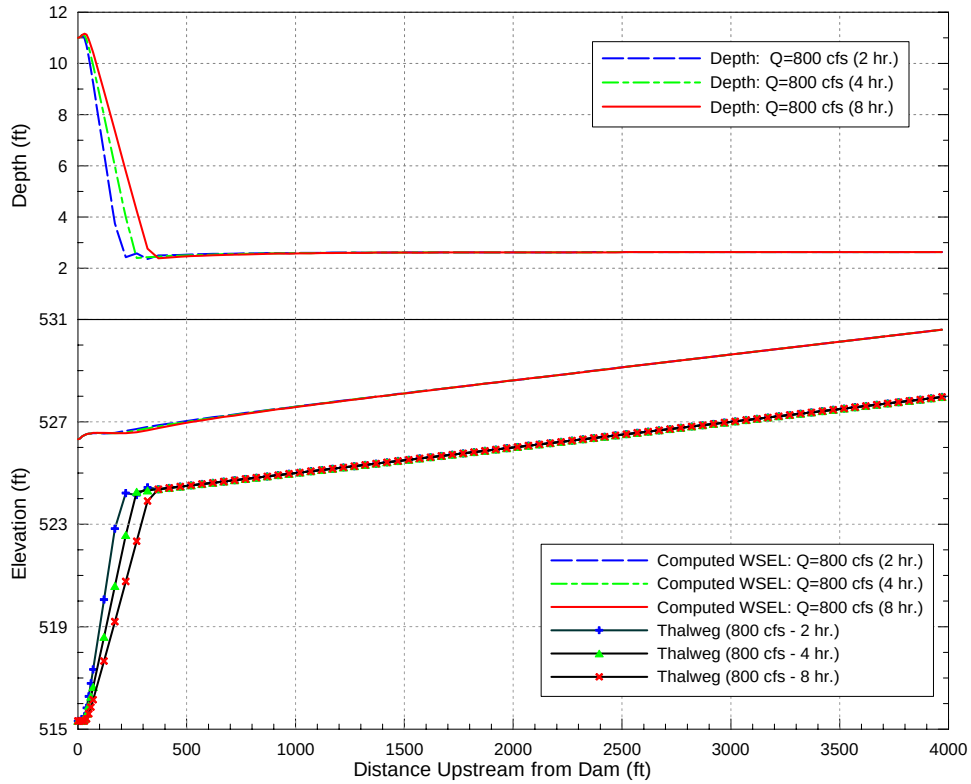


Figure 24. Simulated minimum bed elevation, water-surface elevation and maximum depth profiles at 2, 4, and 8 hours for a constant sluicing discharge of 800 cfs.

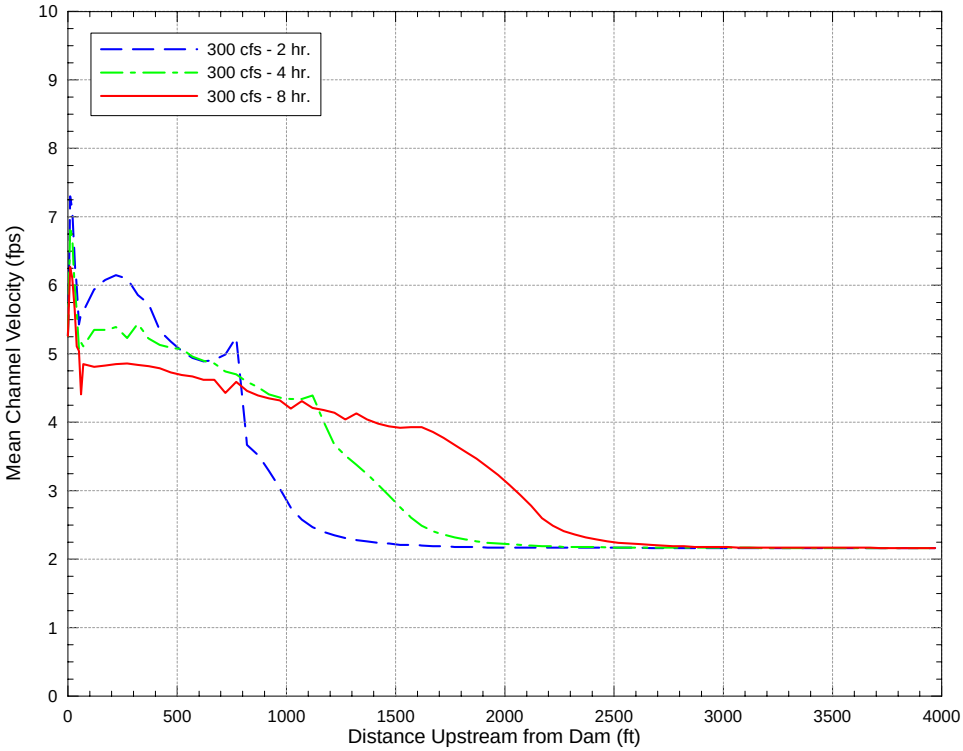


Figure 25. Cross-sectionally averaged velocity profiles at 2, 4, and 8 hours for a constant sluicing discharge of 300 cfs.

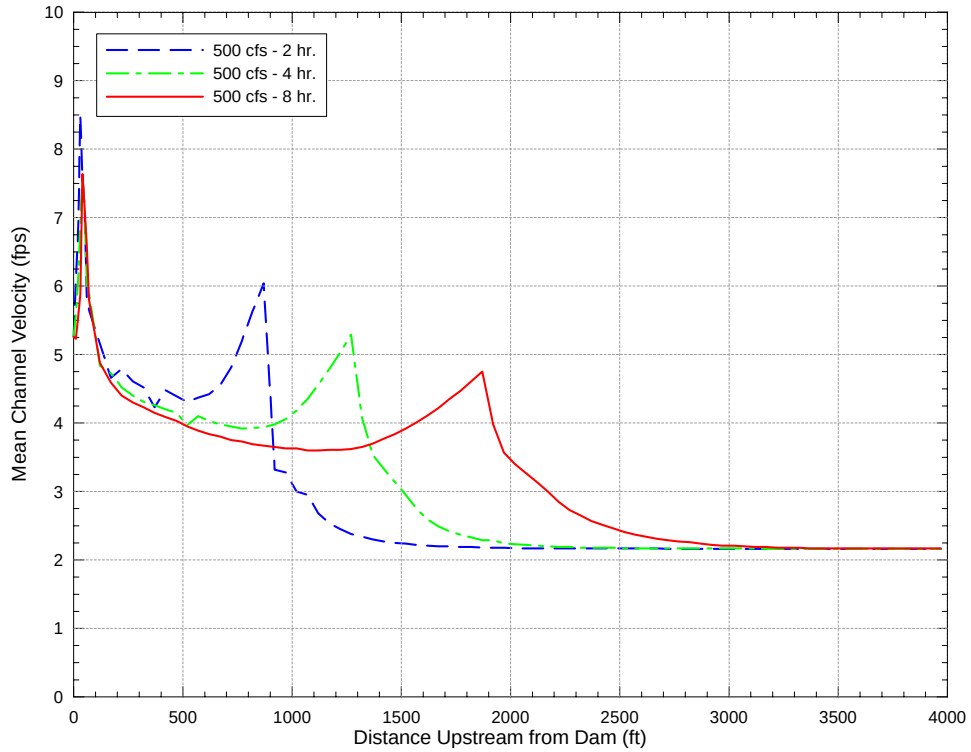


Figure 26. Cross-sectionally averaged velocity profiles at 2, 4, and 8 hours for a constant sluicing discharge of 500 cfs

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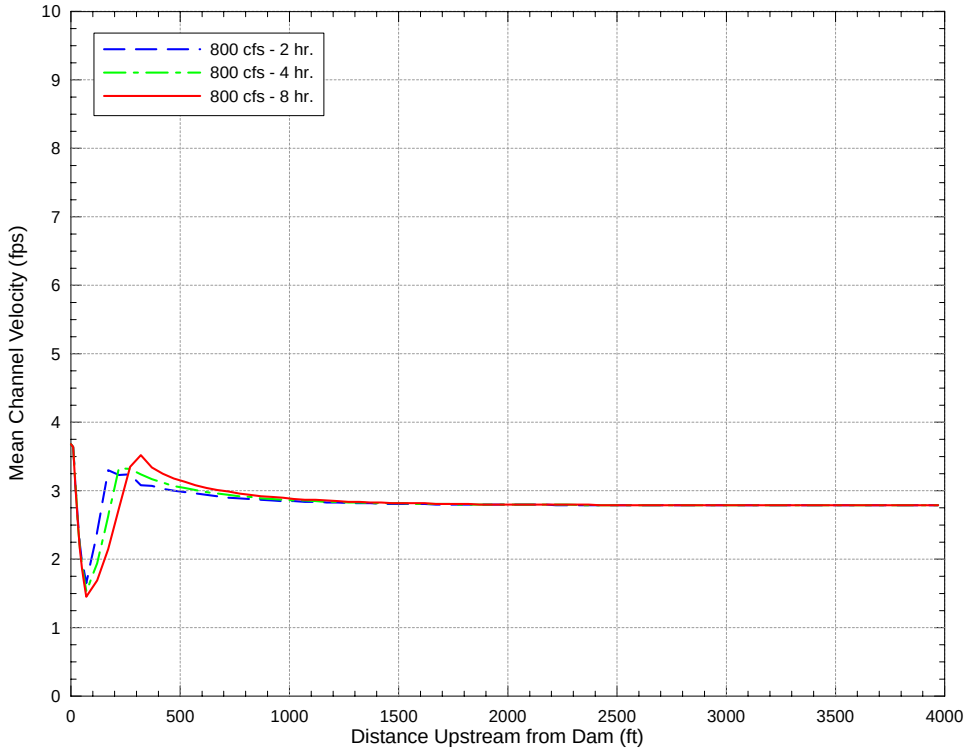


Figure 27. Cross-sectionally averaged velocity profiles at 2, 4, and 8 hours for a constant sluicing discharge of 800 cfs.

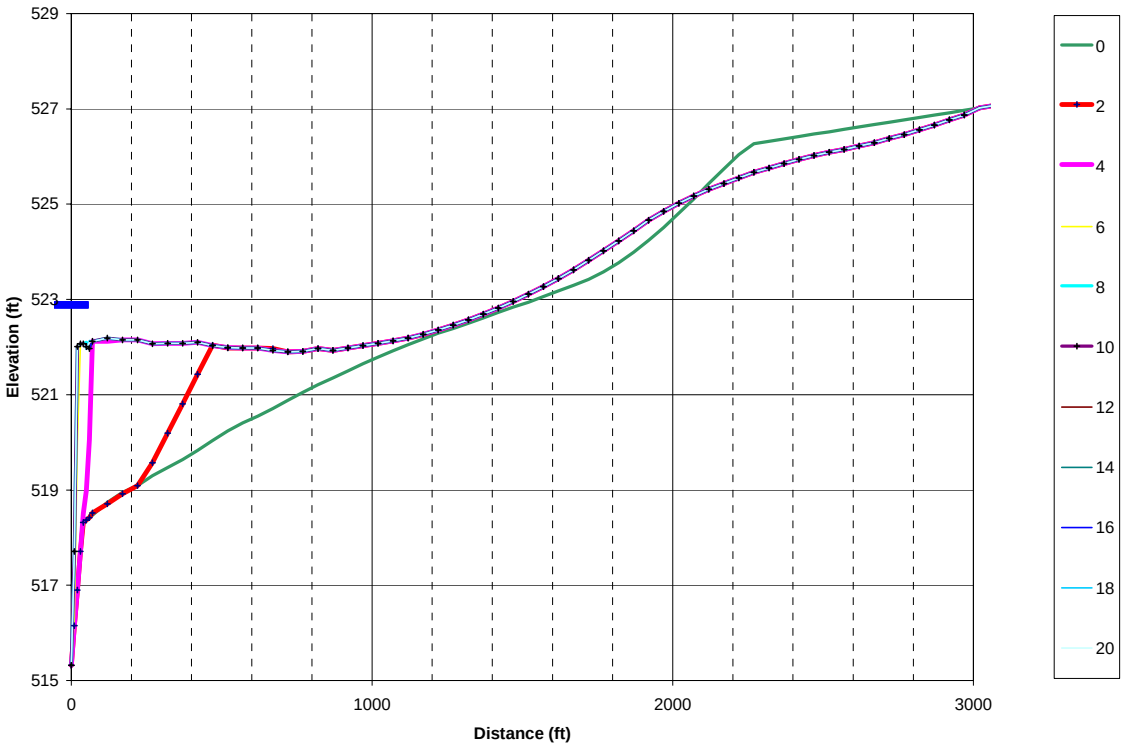


Figure 28. Profile of the incised channel 2 to 20 days after the end of sluicing operations at a constant discharge through the fish ladder of 40 cfs.

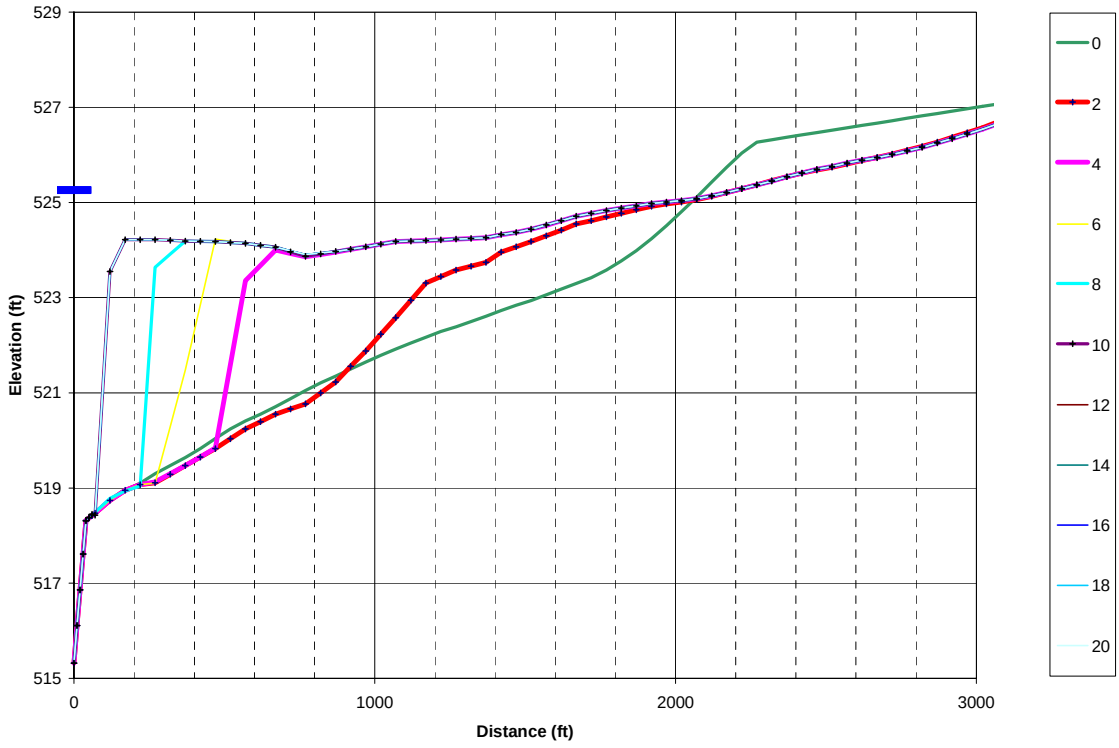


Figure 29. Profile of the incised channel 2 to 20 days after the end of sluicing operations at a constant discharge through the fish ladder of 60 cfs.

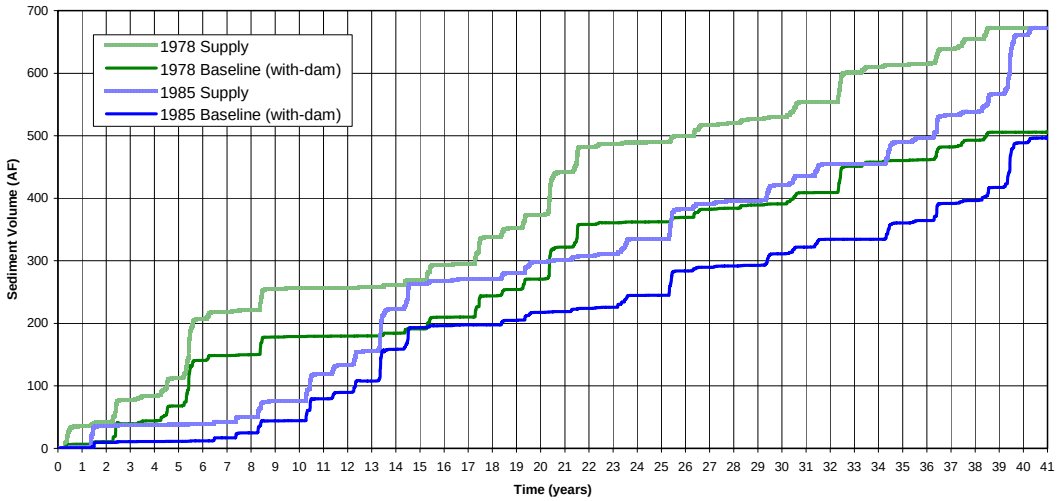


Figure 30. Inflowing Baseload and computed sediment load passing San Clemente Dam for baseline conditions (WY1978 and WY1985 start-dates).

Additional Modeling to Evaluate Sediment Sluicing Options and Compare Downstream Sediment Concentrations for EIR/EIS Alternatives, San Clemente Seismic Safety Project

March 23, 2007
Updated August 9, 2007

1. INTRODUCTION

Mussetter Engineering, Inc. (MEI) was retained by MWH Americas, Inc. (MWH) to perform additional modeling and analysis to assist the project team in evaluating the potential sedimentation impacts and addressing agency concerns about the alternatives that are being considered for the Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) for the San Clemente Dam Seismic Safety Project. This work included the following specific tasks:

1. A detailed analysis of the potential sedimentation impacts of the Proponents Proposed Alternative (dam thickening, reconstruction of the fish-ladder, 10-foot diameter sluice gate to clear sediment from the fish ladder intake) was performed, as follows:

    a. The incised channel geometry from the sluicing model for the 2-hour, 300-cfs sluicing event (see MEI, 2006a) was incorporated into the HEC-6T model of the reservoir.

    b. The reservoir model was run with one year of flows for the two hydrology scenarios that have been used for the previous analyses (1978 and 1985 start-dates[1]) to assess the rate of backfilling of the sluice channel. This analysis generally indicated that the rate of backfilling strongly depends on the sequence of flows that occurs during the post-sluicing period, with generally higher rates of backfilling under low flows and lower rates of backfilling under high flows due to the backwater effects. The analysis also indicated that the backfilled channel will re-incise during the late-summer and fall baseflow periods by flows entering the fish ladder.

    c. Based on the results from the above task, the 2-hour, 300-cfs sluice channel geometry was incorporated into the combined reservoir and downstream river HEC-6T model, and the combined model was run with one year of flows for each of the two hydrology scenarios. These runs included the 2-hour sluicing period, with the sluiced sediment added at the most upstream cross section in the river segment of the model. The sluicing event (and, thus start of each model run) coincided with the

[1] The 1978 hydrology was used to a simulate a period of wet years after the retrofit activities are completed, and the 1985 hydrology was used to simulate a period of dry years after completion of the retrofit activities.

first 300 cfs mean daily flow that occurs after January 1 of each model year (January 4, 1978; February 9, 1985).

d. The results from each model run were post-processed to assess changes in sediment storage, bed elevations, average daily suspended-sediment concentration in the portion of the water column 6 inches or more above the bed, and bed-material gradations.

2. Results from the available model runs were used to asses whether it is reasonable to use the analysis results for the Proponents Proposed Project to evaluate the potential effects of sluicing operations under Alternative 1, which consists of lowering the dam with a 19-foot notch, excavation of existing sediment deposits above the notch, reconstruction of the fish ladder, and installation of a sluice gate.

3. Results from the following HEC-6T runs that were made as part of previous work on these issues were further analyzed to estimate the suspended-sediment concentrations in the Carmel River downstream from San Clemente Dam during the 41-year simulation period:

   a. Existing conditions (San Clemente Dam in-place, and no sediment sluicing)

   b. Alternative 1 (19-foot notch in the dam, excavation of existing sediment deposits above notch)

   c. Alternative 2 (Complete dam removal, excavation of existing sediment deposits, 1-foot of residual sediment remaining in the valley floor at start of simulation).

   d. Alternative 3 (Carmel River re-routed into San Clemente Creek Arm, excavation of existing sediment in San Clemente Creek Arm, 1-foot of residual sediment in valley bottom of San Clemente Creek.

   The existing conditions HEC-6T model run (Item a) was made for the MEI (2005) evaluation of the Carmel River re-route alternative. The model runs for Items b, c, and d were made for the MEI (2006b) residual sediment impact analysis.

2. DETAILED ANALYSIS OF SEDIMENT SLUICING ALTERNATIVE (PROPONENTS PROPOSED PROJECT)

In the original analysis of the sediment sluicing alternative (MEI, 2006a), a special model was developed to simulate sediment transport and evolution of the incised channel into the reservoir deposits during the sluicing operations. This model was developed due, primarily, to limitations in HEC-6T for this specific application that result in unreasonable channel geometries during the sluicing process. The rate at which the incised channel would backfill after completion of the sluicing operations was evaluated using a revised version of the sluicing model with a range of relatively low, steady-state discharges. The potential impacts of sluicing operations on the downstream river were evaluated using a simplified sediment-continuity approach that used the transport capacity of the river in the approximately 1-mile reach downstream from the dam to estimate the time required to remove the sediment delivered through the sluice gate. A more detailed analysis of the behavior of the incised channel in the reservoir, the movement of sediment over the dam and through the fish ladder during non-sluicing periods, and the impacts

of both the sluiced sediment and sediment passing the dam during the non-sluicing periods was performed for this study using a combination of the original sluicing model and an appropriately modified version of the HEC-6T model.

The results from MEI (2006a) indicated that discharges in the range from 300 to 600 cfs would be most effective in sluicing sediment away from the fish ladder entrance with a 10-foot diameter sluice gate. At lower discharges, the rate of incision slows considerably because of the generally lower energy and sediment-transport rates, and at higher discharge the rate of incision slows or, in some cases, even stops, because of backwater caused by the limited hydraulic capacity of the sluice gage. Based on further evaluation of the MEI (2006a) results, the technical project team determined that the preferred criterion for the sluicing would be a 2-hour event at a minimum discharge of 300 cfs. This criterion was selected because the target minimum flow occurs with sufficient frequency during the Steelhead migration period to provide ample sluicing opportunities, and the incised channel will develop sufficiently in a 2-hour period at this discharge to eliminate passage problems in the reservoir. Based on the mean daily flow data from the Carmel River at Robles del Rio gage, the target minimum flow occurred at least once in 42 of the 49 years of available record, with an average of 19 sluicing opportunities per year if both the rising and falling limb of the hydrograph are considered. The analysis in MEI (2006a) indicated that the incised channel would extend approximately 1,000 feet upstream from the dam after 2-hours of sluicing at a steady-state discharge of 300 cfs.

Because of the complexity and level of effort that was required to complete the work, the detailed analysis for this study considered only a single 2-hour sluicing event that occurs on the rising limb of the first hydrograph after January 1 that equals or exceeds 300 cfs.

2.1. Model Setup and Refinement

To insure direct comparability between the original sluicing model used for MEI (2006a) and the HEC-6T model, minor adjustments were made to the assumed reservoir profile in the sluicing model. These adjustments generally involved raising the overbank elevations by approximately 1 foot to better match the irregular surface on the existing deposits. Results from the sluicing model using the modified profile are very similar to the original results, but the length of the incised channel and the volume of sediment passing through the sluice gate increase by a small amount. With the revised profile, the incised channel extends about 1,200 feet upstream from the dam after 2 hours (**Figure 1**), compared to about 1,000 feet in the original analysis (see MEI, 2006a, Figure 14), and the total volume of sediment passing the dam increases from about 2.07 ac-ft (see MEI, 2006a, Figure 12) to 2.39 ac-ft.

The baseline conditions model runs that were made for the previous analyses used the existing reservoir bathymetry, in which an approximately 100-ac-ft pool remains between the reservoir deposits and the dam, as the starting condition. Under these conditions, the trap efficiency of the reservoir remains quite high early in the simulation, particularly at low to moderate flows, limiting the amount of sediment that is delivered to the downstream river. During the first year of the baseline conditions simulation with Water Year (WY) 1978 start-date, for example, approximately 35.3 ac-ft of sediment enters San Clemente Reservoir, but only about 6.7 ac-ft passes over the dam, a trap efficiency of about 81 percent. For the WY1985 baseline simulation, about 2.2 ac-ft of sediment enters the reservoir, essentially all of which is trapped. The baseline model runs indicated that the reservoir will completely fill with sediment within 6 to 10 years, depending the runoff conditions. After the reservoir fills, the trap efficiency decreases substantially and more sediment is passed into the downstream river. For the WY1985 start-

date, 25.9 ac-ft of sediment passes over the dam during the 34th year of the simulation (actual WY1978 flows), a trap efficiency of about 27 percent. For the WY1978 simulation, about 1.4 ac-ft of sediment passes the dam during the 7th year of the simulation (actual WY1985 flows), a trap efficiency of 36 percent. Sluicing operations would only be necessary after the reservoir is completely full; thus, the starting conditions for the sluicing model runs were developed by assuming that the reservoir is full at the start of the water year, and the model was run up to the date of the sluicing event to provide conditions in the downstream river that would be consistent with the reduced trap efficiency of the full reservoir.

Under the proposed configuration for this alternative, all of the flow can pass into the fish ladder up to a discharge through the reservoir of about 60 cfs, at which point water will begin to flow over the main spillway. The maximum discharge in the fish ladder at higher flows is about 70 cfs. The initial main channel in the zone that could be directly affected by sluicing operations of up to 2-hours duration (downstream approximately 1,600 feet of the reach) is represented in the model by a 2-foot deep, trapezoidal channel with 10-foot bottom width. This relatively small channel then transitions to the geometry of the low-flow channel on the reservoir deposits over a distance of about 1,400 feet. To correctly simulate the movement of water and sediment in the reservoir under these conditions, the reach between the head of the transition and the dam was modeled as a split flow reach, with main channel flow in the incision zone set equal to the assumed flow in the fish ladder and the remainder spilling into a split flow segment that represents the overbanks leading up to, and over, the spillway. Flows in excess of the fish ladder discharge are removed from the main channel into the overbank flow path at a series of 10 distributed points along the 1,400-foot transition zone. Model runs were made for both hydrology scenarios assuming that the fish ladder will flow at capacity, based on the rating curve from FishPro and Entrix (2005) (**Figure 2**). As will be discussed below, the incised channel created by the sluicing operations re-fills with sediment relatively rapidly under low-flow conditions with the fish ladder operating at full capacity. The flow into the fish ladder can, however, be restricted to relatively low levels without impairing its effectiveness (Sharon Sawdry, HDR/FishPro, personal communication, December 2006). As a result, an additional run was made for the 1985 simulation, in which the flows after the sluicing operation remain very low for several months, with the discharge in the fish ladder restricted to 10 cfs or less to evaluate the effects of the resulting backwater on refilling rates in the incised channel.

Sediment resulting from the sluicing operation is introduced into the downstream river as a lateral inflow at the first river cross section downstream from the dam that follows the temporal pattern of the sediment load passing through the sluice gate from the sluicing model (**Figure 3**). During the 2-hour, 300-cfs sluicing event used for the analysis, sediment loads passing through the sluice gate range from about 45,000 tons/day (tpd) at the start of the event, increasing rapidly to 68,000 tpd to 70,000 tpd over the next 12 to 15 minutes, and then decreasing back to about 56,000 tpd over the remainder of the sluicing period, resulting in a total sediment volume delivered to the downstream river of about 2.4 ac-ft. During the remainder of the model period, the baseline sediment inflow is delivered to the upstream end of the reservoir, and the amount of sediment passing into the fish ladder and over the spillway is computed by the model based on the hydraulic conditions in the main channel and overbank split flow paths. For purposes of the modeling, it is assumed that any sediment that passes into the fish ladder will be delivered to the downstream river. This assumption is reasonable because the fish ladder was designed so that turbulence in the ladder will keep most of the sand-sized sediment in suspension, and essentially all of the sediment will eventually be delivered to the downstream river.

2.2. Model Results

2.2.1. 1978 Start Date

For the 1978 simulation, the first opportunity at which the discharge meets the sluicing criteria occurs on January 4, when the mean daily discharge is 322 cfs on the rising limb of a flow event that had a maximum mean daily flow on the following day of 831 cfs (**Figure 4**). This event was followed by a series of four additional events over the next two months that had maximum mean daily flows of 2,347 cfs (January 12), 2,819 cfs (February 9) and 1,982 cfs (March 4). Between these events, the flow dropped to 100 to 200 cfs for brief periods. The mean daily flow remained above 60 cfs, the maximum flow that can pass through the fish ladder without flow over the spillway, until June 10.

For this scenario, the crest of the depositional wedge that forms in the incised channel created by the sluicing event progrades downstream to within about 270 feet of the dam within 8 to 10 days after the sluicing event, and it stalls at that location for several days because of the backwater created by the high discharges during the next high flow (**Figures 5a and 5b**). The relatively high flows and associated backwater over the next 60 days cause the wedge to grow more slowly (Figure 5b and **Figures 5c and 5c-1**). After 30 days, the crest is located about 220 feet upstream from the dam, and after 120 days, when the flow has decreased to about 170 cfs, the crest is about 120 feet upstream from the dam. As the flow continues to decline, the backwater effect diminishes, and the rate at which the wedge progrades downstream increases, reaching the vicinity of the dam at about Day 150, when the discharge is just over 70 cfs. During this period, the elevation of the wedge crest remains at or slightly above 524 feet, the approximate equilibrium elevation when there is flow over the spillway. As the discharge continues to decline toward the summer baselevel, all of the flow passes through the fish ladder, and the water-surface elevation in the reservoir continues to decline, causing the channel leading to the fish ladder to incise. At 180 days after the sluicing event, the thalweg of the incised channel just upstream from the fish ladder has lowered to elevation 520.7, about 2.7 feet above the invert of the fish ladder (**Figures 5d and 5d-1**). Over the remainder of the year, the flow remains relatively low, and the thalweg of the incised channel just upstream from the dam varies from 1 to 2 feet above the fish ladder invert.

During the winter and spring after the sluicing event, very little sediment passes through the fish ladder, but a substantial amount passes over the spillway (23.8 ac-ft in the 120-day period after sluicing) (**Figure 6**). During the remainder of the year, essentially all of the flow passes through the fish ladder, carrying with it about 3.8 ac-ft of sediment. The total sediment volume passing the dam between the start of the sluicing event and the end of the calendar year is about 30.7 ac-ft, of which 2.4 ac-ft is delivered during the sluicing event, 24.4 ac-ft goes over the spillway and 3.8 ac-ft passes through the fish ladder (**Figure 7**). This represents about 86 percent of the 35.5 ac-ft sediment supplied to the reservoir from upstream during the period (**Figure 8**). As also shown in Figure 7, about 6.5 ac-ft of sediment passes over the spillway between the date of the sluicing event (January 4) and the end of the calendar year under baseline (existing) conditions, and about 26.4 ac-ft of sediment would pass over the dam if the reservoir were completely filled with sediment (Modified Baseline Scenario). For comparison purposes, the total amount of sediment passing over the dam during the period from January 4 through December 31 under Alternative 1 (Dam Notching), Alternative 2 (Complete Dam Removal), and Alternative 3 (Carmel River Re-route) is about 34.5, 36.6, and about 27.9 ac-ft, respectively

For all of the scenarios that were modeled, with the exception of Alternative 2 (Complete Dam Removal), nearly all of the sediment passing the dam is in the sand-size range (**Figure 9**). Under the sluicing scenario, a small component of the sediment passing the dam (about 2 percent) is fine gravel (<8 mm), and for Alternative 3 (Carmel River Re-route), about 3 percent of the material is fine to medium gravel. For Alternative 2 (Complete Dam Removal), about 10 percent of the material is fine gravel, and an additional 6 percent is medium to coarse gravel (>8 mm).

Under baseline conditions, most of the upstream sediment is trapped in the residual pool in the reservoir, and sediment is eroded from the downstream river during the high-flow events that occur during January, February and March (Figures 8 and **10**). With the reservoir filled with sediment (modified baseline conditions), a substantial amount of the inflowing sediment load passes over the spillway, accumulating in the downstream river. By about the middle of the February event, the sediment load from the January flows begins to affect the downstream end of the reach, increasing the sediment load to the ocean and causing a net loss of sediment from the overall reach. During the March event, even more sediment is evacuated from the reach, so that by the end of the event, there is slightly less stored sediment than there was at the beginning of January. As the discharge continues to recede to the summer baseflow-level, additional sediment is evacuated from the overall reach. By the end of the year, the net removal from the reach totals about 1.2 ac-ft.

Under the sluicing scenario (Proponents Proposed Project), the depositional behavior in the downstream river is very similar to that under modified baseline conditions. As previously discussed, the sluicing event delivers about 2.4 ac-ft of sediment to the downstream river. During the early part of the first day after sluicing, the predicted sediment loads in the reach just downstream from the dam are consistent with the transport capacity for the sand-sized sediment that is delivered through the sluice gate (**Figure 11**). Within the first several hours, however, the load in the portion of the reach between the dam and Old San Clemente Dam (referred to in the figures as Subreach [SR] 4.3a) diminishes rapidly to levels that are only a fraction of the transport capacity because the available sand from the sluicing event is evacuated from the reach and the amount of sediment passing over the spillway is relatively small. By the middle of the second day after sluicing, the loads in SR4.3a are actually less than under modified baseline conditions because the sediment evacuated during the sluicing increases the trap efficiency of the reservoir and decreases the supply to the downstream river. As a result, the amount of erosion in SR4.3a is actually greater during the high-flow events in January under modified baseline conditions than under the sluicing scenario (**Figures 12 and 13**; SR4.3b and SR4.3c are the middle and downstream portions of SR4.3, respectively). Under modified baseline conditions, there is very little change in sand storage in the downstream river from the start of the summer baseflow period through the end of the year because the high-flow events removed much of the stored sand and very little passes the dam. Under the sluicing scenario, the sediment that passes through the fish ladder during the summer baseflow period accumulates in the downstream river because of the low flows and, thus, low transport capacity of the river.

2.2.2. 1985 Start Date

For the 1985 start-date simulation, the first opportunity at which the discharge meets the sluicing criteria occurs on February 9, when the mean daily discharge is 303 cfs at the peak of a small flow event that recedes back to less than 60 cfs within 7 days (**Figure 14**). This event was followed by a series of smaller events over the next two months with maximum mean daily

discharges ranging from 120 to 240 cfs. The mean daily flow remained below 60 cfs after April 16, with very low baseflows in the range of 5 to 7 cfs throughout the summer and early fall. A short duration event occurred in early December, near the end of the calendar year, with a maximum mean daily discharge of 433 cfs (December 3, 1985).

2.2.2.1. Fish Ladder at Capacity

For this scenario, the crest of the depositional wedge in the incised channel progrades downstream to within about 70 feet of the dam within 10 days after the sluicing event and it approaches the face of the dam in 14 to 15 days (**Figures 15a and 15b**). During the first 5 to 7 days, the elevation of the crest remains at above 523.7 feet, and it then lowers to about 522.5 feet after 10 days. After 15 to 45 days, the sediment deposits remain near the face of the dam, and the elevation of the surface fluctuates between about 521.5 and 524 feet as the deposits respond to the minor high-flow events that exceed the capacity of the fish ladder **(Figure 15b-1**). By 60 days after the sluicing event, the top of the deposits has increased to about elevation 524 feet, which is about one foot below the crest of the spillway (**Figures 15c and 15c-1**). During the remainder of the baseflow period, all of the flow passes through the fish ladder and the water-surface elevation in the reservoir continues to decline, causing the channel to incise to a level that is consistent with the invert of the fish ladder (Figure 15c-1 and **Figure 15d**). The flow event that occurs in early December causes the deposits to build up again to an elevation of 520 feet, about 2 feet above the invert of the fish ladder (**Figure 15d-1**).

For this scenario, the total sediment load passing the dam from the end of the sluicing event to the end of the calendar year is about 5.5 ac-ft, 4.2 ac-ft of which passes through the fish ladder and 1.3 ac-ft of which passes over the spillway (**Figure 16**). A substantial amount of sediment passes through the fish ladder during the late-winter and spring when the flow remains somewhat elevated, but is sufficiently low that most passes through the fish ladder. Including the 2.4 ac-ft associated with the sluicing event, the total sediment load passing the dam between the sluicing event and the end of the calendar year is about 7.8 ac-ft, whereas, only about 1.8 ac-ft of sediment is delivered to the reservoir from upstream (Figure 7). As also shown in Figure 7, little if any sediment passes the dam during this period under baseline (existing) conditions, but about 2.6 ac-ft of sediment would pass over the dam if the reservoir were completely filled with sediment (Modified Baseline Scenario). The quantity of sediment passing over the dam during this period under Alternative 1 (Dam Notching), Alternative 2 (Complete Dam Removal), and Alternative 3 (Carmel River Re-route) is about 3.9, 1.7, and about 1.1 ac-ft, respectively. All of the sediment passing the dam for the simulation is in the sand size-range (Figure 9). Under all of the scenarios that do not involve sluicing, the bulk of the sediment load over the dam occurs during the flow events in March and April (**Figure 17**). Sediment passing through the fish ladder when it is allowed to operate at full capacity results in additional sediment load to the downstream river that does not occur under the other alternatives through at least July.

Because of the relatively low flows after early-February, very little sediment is evacuated from the downstream river under any of the scenarios that were considered; thus, most of the sediment passing the dam goes into storage along the reach (**Figure 18**). Under the proposed project, with the fish ladder operating at capacity, about 5.8 ac-ft of additional sediment is stored in the downstream river between the end of the sluicing event and December 31, compared to about 1.4 ac-ft during the same period under modified baseline conditions. Nearly all of the additional sediment is stored in SR7.7 and SR9, and there is net erosion in most of the other reaches under modified baseline conditions (**Figure 19**). Under the proposed project with the

fish ladder at capacity, the sediment delivered from the sluicing event is removed from SR4.3a (San Clemente Dam to Old San Clemente Dam) within about 40 days, but the additional sediment that is delivered through the fish ladder during late-spring and early-summer causes a portion of the additional sediment to be stored in this part of the reach until the high-flow event that occurs in December flushes it downstream (**Figure 20**). In general, the additional sediment load passing the dam under this alternative is distributed through the downstream reach throughout the remainder of the year.

2.2.2.2. Fish Ladder Restricted to 10 cfs

The sediment loads through the fish ladder during the late-winter through spring period for the 1985 scenario are relatively high. The high sediment loads occur because the flows are high enough to entrain and transport significant quantities of the sand-sized reservoir deposits, but low enough that most of the flow passes through the fish ladder. It is MEI's understanding that flow through the fish ladder can be restricted by controlling the size of the opening at the downstream side of the first pool (Sharon Sawdry, HDR/FishPro, personal communication, December 2006). This would cause elevated water-surface elevations in the reservoir that would force more flow over the spillway, move the depositional zone in the incised channel farther upstream in the reservoir, and limit the amount of sediment that is carried into the fish ladder. To evaluate the effectiveness of restricting the flow in the fish ladder, the 1985 model run was revised so that a maximum flow of 10 cfs is allowed to pass into the fish ladder, with any flows in excess of 10 cfs passing over the spillway.

For this scenario, the backwater created by the restricted flow into the fish ladder significantly limits the amount of deposition in the incised channel during the late-winter and spring. During the 125-day period after the sluicing event (February 9 through June 14) when the flows exceed 10 cfs, the sediment wedge in the incised channel progrades slowly downstream, with the crest located about 320 feet upstream from the dam at the end of the period (**Figures 21a, 21b, 21c**). When the discharge falls below 10 cfs, the channel rapidly incises into the wedge to a profile that is consistent with the control provided by the invert of the fish ladder due to the steep energy gradient associated with the reduced stage at the fish ladder (**Figure 21d**). The profile of the incised channel remains at the lower elevation until the high-flow event in early December when a new wedge forms at the upstream end (**Figure 21d**).

For this scenario, about 2.8 ac-ft of sediment passes over the spillway, but little or no sediment passes into the fish ladder between the sluicing event and May 31 (**Figure 22**). The incision into the depositional wedge in the reservoir when the flows drop below 10 cfs on June 15 causes a substantial amount of sediment to be carried into the fish ladder. Between that time and December 31, about 2.1 ac-ft of sediment passes through the fish ladder, and only about 0.7 ac-ft passes over the spillway into the downstream river.

The total amount of sediment that passes the dam between the sluicing event and the end of the year under this scenario is similar to that with the fish ladder operating at full capacity; however, both the temporal pattern and mode of delivery are different (Figure 17). More sediment is delivered across the dam between the sluicing event and early April when the last runoff event begins to recede, however, essentially all of this sediment passes over the spillway. During the period from early-April through mid-June, little or no sediment passes the dam under this scenario, while a substantial load passes through the fish ladder under the scenario with the fish ladder operating at capacity. The sediment load then abruptly increases with the reduction in stage as the restriction on the fish ladder is removed. Similar to the full ladder capacity

scenario, the sediment resulting from the sluicing operation is eroded from the reach between San Clemente Dam and Old San Clemente Dam (SR4.3a) during the first approximately 45 days of the simulation; however, additional sediment continues to be eroded during the next 2 to 3 weeks due to the reduced sediment supply passing the dam. When the sediment wedge erodes in mid-June, part of the sediment that passes through the fish ladder accumulates in SR4.3a, where it remains until the December high-flow event (**Figure 23**). The deposition patterns through the rest of the reach are similar to those under the full fish ladder capacity scenario.

2.3. Summary and Recommendations Regarding Sluicing Alternative

For the Proponents Proposed Project, a 10-foot diameter sluice gate will be constructed near the fish ladder with the invert of the sluice gate set about 3 feet below the invert of the fish ladder. Under the assumed operating rules, the sluice gate would be opened for a two hour period on the first occurrence of a 300-cfs flow in the river after January 1. Results from a special sediment routing model that was developed for MEI (2006a) to assess the behavior of the reservoir during the sluicing operations indicates that about 2.4 ac-ft of sediment would be eroded from the reservoir and delivered through the sluice gate into the downstream river after 2 hours at a steady-state flow of 300 cfs. The erosion would create an incised channel that would extend approximately 1,200 feet upstream from the dam. This channel was inserted into the HEC-6T model of the reservoir and river that has been modified to incorporate the proposed fish ladder, and the model was run for approximately one year after the sluicing event for each of the two hydrology scenarios to assess the rate at which the incised channel will re-fill with sediment, the amount of sediment that will be carried into the fish ladder or over the spillway during the post-sluicing period, and the impacts of both the sluiced sediment and post-sluicing sediment load on sediment storage and suspended-sediment concentrations in the downstream river. The following specific conclusions can be drawn from the results of these analyses:

1. Under the 1978 hydrology scenario, in which a series of three relatively high-flow events occurs during the 90-day period after sluicing and the flows remain above the capacity of the fish ladder through early June, backwater from the dam prevents the depositional wedge in the incised channel from migrating sufficiently far downstream to cause sediment impacts to the fish ladder. After the flows recede to baselevels that are within the capacity of the fish ladder, the depositional wedge rapidly approaches the dam and a substantial quantity of sediment passes into the fish ladder. As the flows continue to recede, the water-surface elevation at the fish ladder entrance declines and the upstream channel re-incises to a level that is consistent with the control provided by the fish ladder invert. During the backwater period, little or no sediment enters the fish ladder (Figure 6). During the subsequent baseflow period, substantial sediment enters the fish ladder, resulting in total sediment concentrations ranging to about 3,500 ppm (**Figure 24**).

2. Under the 1985 hydrology scenario, the flow event that would trigger sluicing has a maximum mean daily flow of about 300 cfs and the flow declines rapidly to about 40 cfs over the next few weeks. This event is followed by a series of smaller events with maximum flows in the 120- to 240-cfs range. With the fish ladder operating at its full capacity, the depositional wedge in the incised channel approaches the dam within the first two weeks of the simulation, at which point a substantial amount of sediment passes into the fish ladder. Although there would be sufficient flow depth to permit fish passage through the fish ladder into the upper part of the reservoir, the relatively high sediment loads in the fish ladder may be problematic. During late-February and early-March, for example, the predicted sediment

concentration in the fish ladder exceeds 1,000 ppm for several days, and concentrations of about 1,000 ppm also occur from late-April through mid-May (**Figure 25**). As the flow continues to recede to the very low baseflows through the summer and fall, the channel would re-incise to levels consistent with the control provided by the fish ladder, similar to the behavior under the 1978 hydrology scenario. During this period, the sediment concentrations in the fish ladder are also elevated.

3. Restricting the discharge through the fish ladder to 10 cfs or less under the 1985 scenario would effectively eliminate the sedimentation problems that occur under the full-capacity condition by creating backwater that keeps the depositional wedge a significant distance upstream from the dam until mid-June. During this period, the sediment loads and concentrations in the fish ladder are very low (Figures 22 and 24). Similar to the other scenarios, the sluice channel re-incises back to levels consistent with the control provided by the fish ladder during the summer and fall baseflow period.

4. The behavior of the incised channel during the baseflow period suggests that, if sediment passing into and through the fish ladder during the non-migration, baseflow period is acceptable, the necessity to sluice may be limited during subsequent years after the initial event because of the tendency for the channel to re-incise. As a result, dredging to enlarge the channel during the late-fall prior to the migration season each year, as necessary, may be a viable alternative to operation of the sluice gate.

2.4. Potential Impact of Sluicing Under Alternative 1 (Dam Notching)

Under Alternative 1 (Dam Notching), the profile on the sediment deposits after excavation would intersect the pre-dam profile about one mile upstream from the dam in the Carmel River Branch, assuming that the gradient across the remaining deposits after excavation is the same as the existing reservoir gradient (MEI, 2006; **Figure 26**). The sediment deposits beneath the reconstructed channel in the reach between the dam and the intersection with the pre-dam profile will be finer than in the up- and downstream river, which will affect the transport rates and downstream sediment delivery (**Figure 27**). About 36.6 ac-ft of sediment will pass over the dam during the first full water year after construction of the notch for the 1978 hydrology under this alternative, which exceeds the amount for all of the other alternatives except Alternative 2 (Complete Dam Removal), including the Proposed Project (Figure 8), and under the 1985 hydrology about 6.6 ac-ft of sediment will pass over the dam, which exceeds the quantity for all of the alternatives except the Proposed Project during this very dry year (Figure 17).

If a fish ladder and sluice gate were constructed and operated for Alternative 1 similar to the configuration for the proposed project, the sediment-transport behavior in the reservoir and downstream river would be similar to that described above. During the initial sluicing event, the channel upstream from the sluice gate would develop more quickly because of the finer sediment into which it incises. As a result, the initial downstream sediment loads would also be somewhat larger. The duration of the downstream impacts would, however, be reduced because the transport capacity would be higher for the finer sediments, and thus, they would be flushed through the system more quickly. Over a period of several years after the initial event, the downstream sediment load would become somewhat coarser and the incised channel more stable because more of the gravel that is supplied to the reservoir from upstream and that is presently stored in the upstream end of the reservoir, would migrate downstream into the incised channel due to the steepened gradient associated with lowering of the sediment deposits. The incised channel under the Proposed Project would behave in a similar manner,

but would incise at a much slower rate due to the flatter gradient and longer distance over which the gravels would need to travel. The long-term behavior of both alternatives, would, however, be very similar because the reservoir and sluice channel would reach a state of equilibrium with the sediment supply to the upstream end of the reservoir.

3. COMPARISON OF DOWNSTREAM SUSPENDED SEDIMENT CONCENTRATIONS FOR EIS/EIR ALTERNATIVES

Suspended sediment can adversely affect the health of fish, with the severity of the effect increasing as a function of the sediment concentration and duration of exposure (Newcombe and Jensen, 1996). To quantify that adverse impact, Newcombe and Jensen (1996) presented data that indexed the severity-of-ill-effect on various fish species at different growth stages to both the level of suspended-sediment concentrations and the duration of exposure to those higher levels.

MEI (2003) included an analysis of the suspended-sediment concentration in the part of the water column from 6 inches above the channel bed to the water surface for three of the scenarios that were modeled under the 1978 hydrology conditions. This analysis was performed to provide information that can be used by the fishery biologists in assessing the potential impacts to fish during periods when significant sand and finer sediment is being transported by the river. The portion of the water column that was considered in the analysis was selected based on the opinion of the biologists that the fish will tend to avoid the high concentration areas near the bed when substantial sediment is being transported by the river. The analysis was performed for the entire 41-year simulation for the baseline conditions scenario that was reported in MEI (2005) and the dam removal/retrofit scenarios that were considered in MEI (2006b) for both the 1985 and 1978 hydrology scenarios. The analysis was also performed for the period from the sluicing event to the end of the calendar year for both model years for the Proponent's Proposed Project. Results from the sluicing analysis were compared to the original baseline conditions results, as well as a modified baseline conditions run for the equivalent period that assumes that the reservoir is filled with sediment at the start of the sluicing event; thus, reducing the trap efficiency of the reservoir compared to existing conditions.

The HEC-6T model does not separate the bed-load and suspended fractions of the bed-material load in the sediment-routing computations. In performing the analysis, it was, therefore, necessary to estimate the suspended-load concentrations by post-processing the model output using a separate computer model that applies theoretical relationships to estimate the vertical suspended-sediment concentration profiles and resulting loads and concentrations. The estimates were made for each day in the simulations using hydraulic data developed by extracting the cross-sectional geometry from the HEC-6T output. To facilitate evaluation of the results, the hydraulic relationships and resulting sediment concentrations were estimated on a reach-averaged basis for each of the 10 subreaches in the main river channel downstream from San Clemente Dam.

The analysis was performed using the procedure developed by Einstein (1950) in which the suspended-sediment concentration profile is estimated for a particular set of hydraulic and sediment-transport conditions by solving the diffusion equation assuming that, in an equilibrium profile, the average rate at which individual particles settle in the water column is the same as

the average rate of upward flux associated with eddies and flow turbulence. The resulting concentrations are then multiplied by the estimated point velocities using the well-known logarithmic vertical velocity profile to estimate the suspended-sediment load at each depth in the profile. Finally, the total suspended-sediment load is obtained by integrating the resulting suspended-sediment load profile over the flow depth. By changing the limits of integration for the Einstein (1950) equation, it is possible to compute the average suspended-sediment concentration and load over any portion of the water column that is of interest. The logarithmic velocity profile is given by the following relationship:

$$\frac{\bar{u}_y}{u_*} = 5.75\log_{10}\left(30.2\frac{yx}{k_s}\right) = 5.75\log_{10}\left(30.2\frac{y}{\Delta}\right) \quad (1)$$

where:

$\bar{u}_y$	= average point velocity at a distance y from the bed
u_*	= shear velocity
y	= distance from the bed
k_s	= roughness of bed
x	= corrective parameter
$\Delta = k_s / x$	= apparent roughness of the surface

The suspended-sediment concentration profile is given by the following relationship, initially proposed by Rouse (1937):

$$\frac{c_y}{c_a} = \left(\frac{d-y}{y}\frac{a}{d-a}\right)^z \quad (2)$$

where:

C_y	= average concentration at a distance y from the bed
C_a	= average concentration at a distance *a* from the bed
d	= hydraulic depth
y	= distance from the bed
a	= distance to the reference point above the bed
z	$= \frac{\upsilon_s}{0.40u_*}$
υ_s	= kinematic viscosity

Combining Equations 1 and 2, Einstein (1950) obtained the following relationship for suspended-sediment transport:

$$q_s = 5.75u_* dc_a\left(\frac{A}{1-A}\right)^z\left\{\log_{10}\left(\frac{30.2d}{\Delta}\right)\int_A^1\left(\frac{1-y}{y}\right)^z dy + 0.434\int_A^1\left(\frac{1-y}{y}\right)^z \log_e y dy\right\} \quad (3)$$

where:

$A = a/d$

and all other variables are as defined previously.

To perform the calculations, the concentration at the reference point *a* was estimated by assuming that this point is located at the top of the bed layer; thus the concentration at *a* will be the same as the sediment concentration in the bed layer that is estimated based on transport rates predicted by the Meyer-Peter-Müller (1948) bed-load equation. The sediment load and average concentration over different portions of the water column were then estimated by adjusting the limits of integration in Equation 3.

Based on advise from the fishery biologists, two threshold values (500 and 2,000 mg/l) were chosen as a basis for comparing the various alternatives and hydrology scenarios. The total number of days and the maximum number of consecutive days that these two values were equaled or exceeded during the 41-year simulation period was determined for each of the alternatives, except for the Proponents Proposed Project (**Table 1**). (Complete 41-year simulations were not performed for the Proponents Proposed Project due to the uncertainty regarding when and how subsequent sluicing events would be conducted after the initial event.) Under baseline conditions, the suspended-sediment concentrations above 6 inches above the bed exceeded 500 ppm on a mean daily basis for a total of 21 days (SR4.7) to 33 days (SR7.7 and SR8.7) under the 1978 hydrology scenario, and 23 days (SR 4.7) to 42 days (SR7.3) during the 41-year simulation under the 1985 hydrology scenario. A similar number and duration of occurrences is experienced under Alternative 1 (Dam Notching). Under Alternative 2 (Complete Dam Removal), the number of exceedences of the 500-ppm threshold increases to the 33 days (SR4.7, SR5, and SR9) to 42 days (SR4.3), with durations of up to 5 days under the 1978 hydrology scenario, and 35 days (SR4.7) to 44 days (SR7.7), with durations of up to 5 days under the 1985 hydrology scenario. Both the number and maximum duration of occurrences exceeding the 500-ppm threshold under Alternative 3 (Carmel River Re-route) are about midway between Alternatives 1 and 2. The 2,000-ppm threshold was only exceeded for one day during the entire 41-year simulation period in the downstream portions of the reach (SR5 through SR9). Tables containing the daily concentration values for each scenario and each subreach are provided in electronic format CD that is included as Appendix A.

The impact of the Proposed Project on downstream suspended-sediment concentrations were also evaluated for the period from the start of the sluicing event to the end of the calendar year in which the event occurred for each of the two hydrology scenarios (**Table 2**). Under the 1978 hydrology scenario, the 500-ppm threshold is exceeded for a total of 6 days during the period from January 4 through December 31 in SR4.3a and SR4.3b (upstream two-thirds of SR4.3). This occurs for a 2- to 3-day period immediately after the sluicing event, and for three separate days during the fall baseflow period. Downstream from SR4.3, this threshold was only exceeded for 2 days in SR7.3 and 1 day in SR6.7 during the period. Although the initial concentrations after the sluicing event are relatively high, the sediment added from the sluicing is quickly diluted by the high flows that occur during this period. In contrast, for the modified baseline conditions (reservoir full of sediment) run, the suspended-sediment concentration exceeded the 500-ppm threshold for a maximum of two days in the middle part of the reach (SR6.7 and SR7.3) under the modified baseline conditions scenario, and there were no exceedences for any of the three alternatives.

For the 1985 hydrology scenario, the suspended-sediment concentrations exceeded the 500-ppm threshold for 4 to 11 days in SR4.3 (Table 2) for maximum durations of 2 to 3 days. Downstream from SR 4.3, there were no exceedences of the 500-ppm threshold during the model period. For the modified baseline conditions run, there were no exceedences, and only a few isolated exceedences for the other alternatives under this hydrology scenario. Except perhaps at the most upstream few cross sections in the model directly below the dam, the

suspended-sediment concentrations did not exceed the 2,000-ppm threshold during the model period for either the 1978 or 1985 hydrology scenarios.

In general, these results indicate that the sluicing operation will cause elevated suspended-sediment concentrations during and immediately following the sluicing event, but these effects do not propagate significantly downstream. Under hydrology scenarios when high flows occur after sluicing, the sediment concentrations are rapidly diluted in the downstream direction. Under low-flow conditions, the effects are greater and they tend to persist for longer periods, but appear to be limited to the upstream canyon-bound segment of the study reach.

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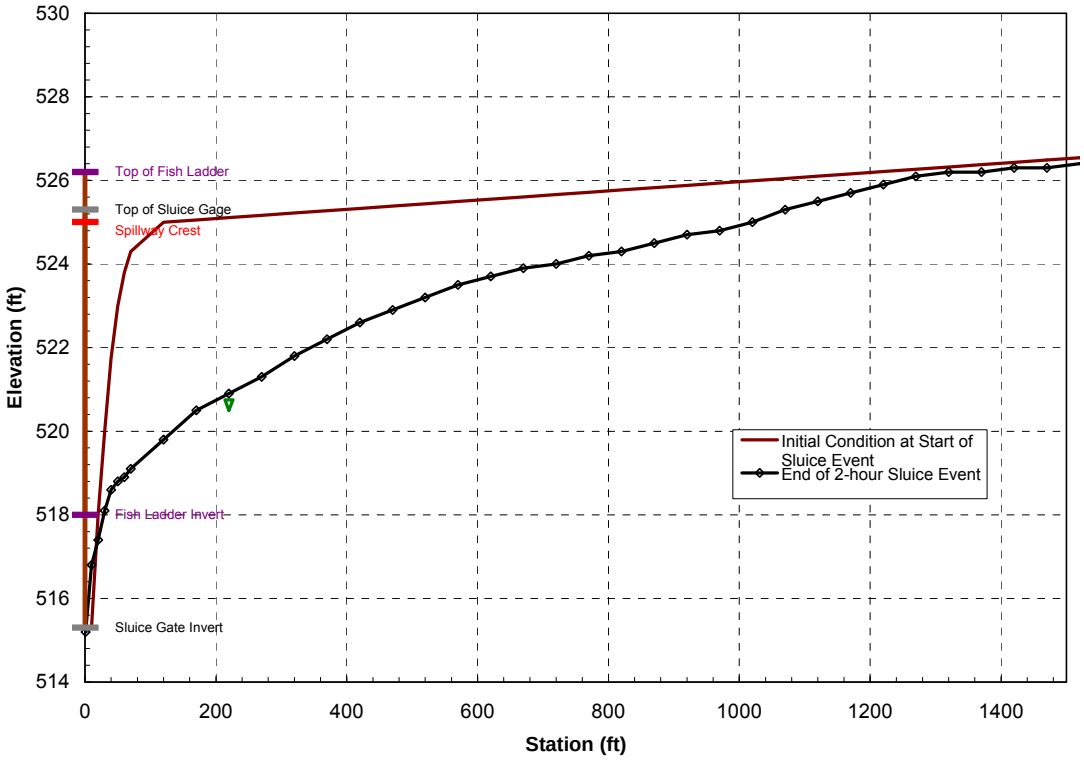


Figure 1. Assumed longitudinal profile of the sediment deposits in San Clemente Reservoir at the start of the sluicing event, and the simulated profiles after 2, 4, 8, and 24 hours of sluicing at a steady-state discharge of 300 cfs.

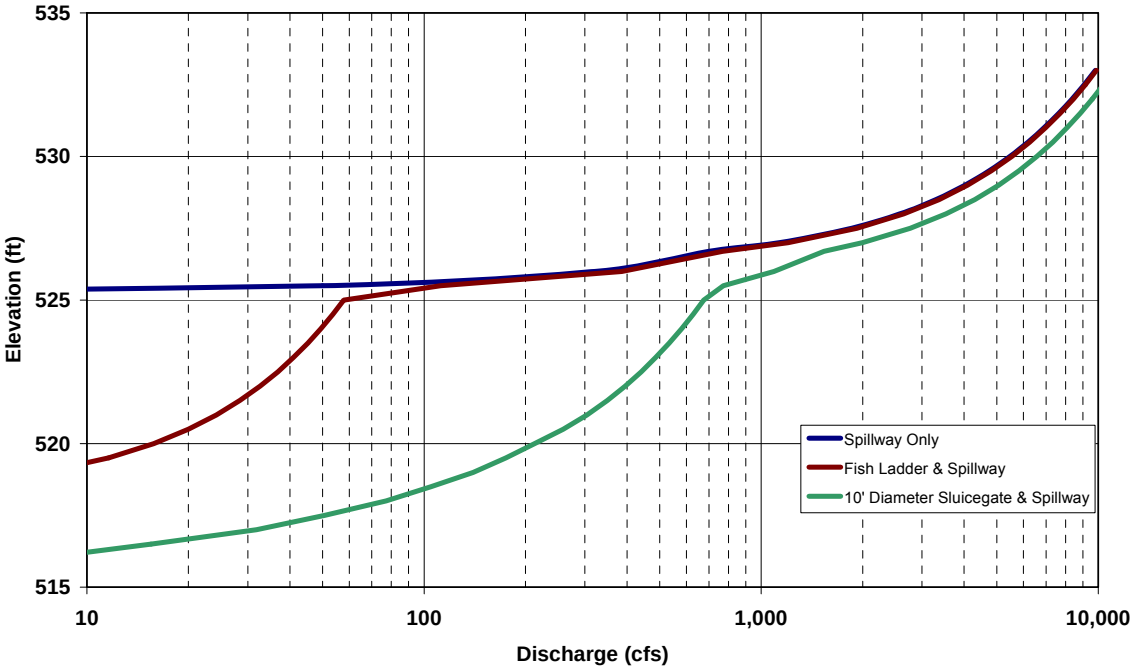


Figure 2. Hydraulic capacity rating curves for the principal spillway at San Clemente Dam, the combined fish ladder and spillway capacity, and the 10-foot diameter sluice gate and spillway.

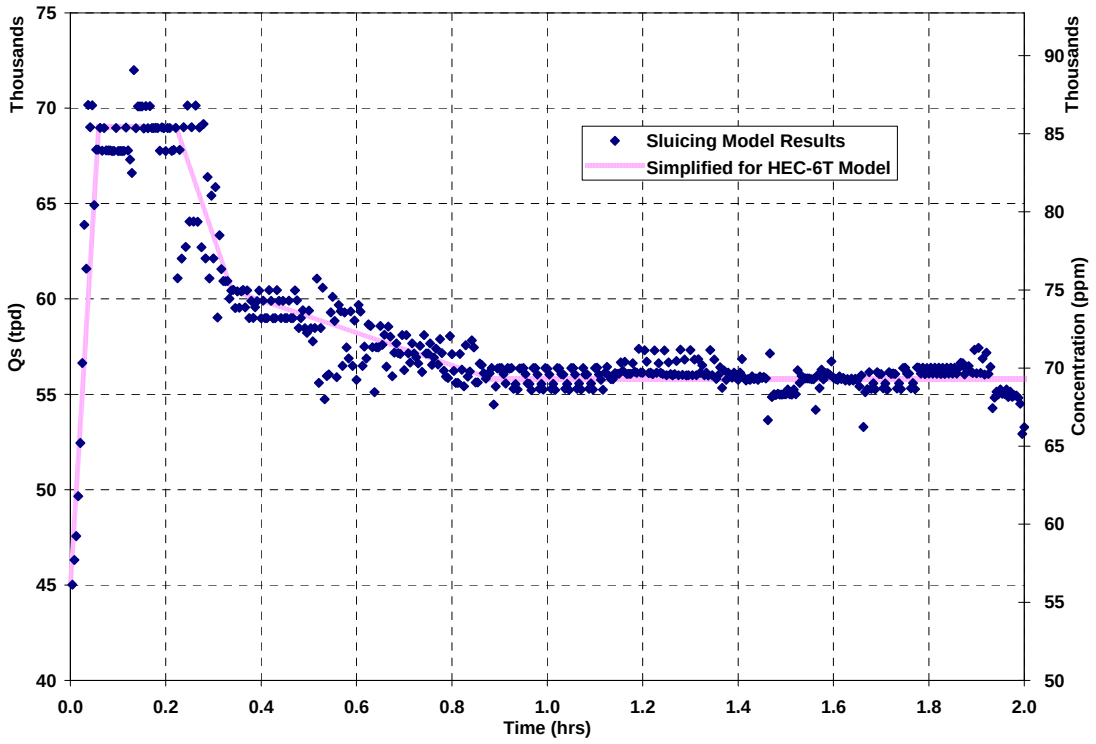


Figure 3. Sediment loads passing through the sluice gate during the 2-hour sluicing event from the sluicing model. Red line represents the sediment load-discharge relationship used in the HEC-6T model during the sluicing period.

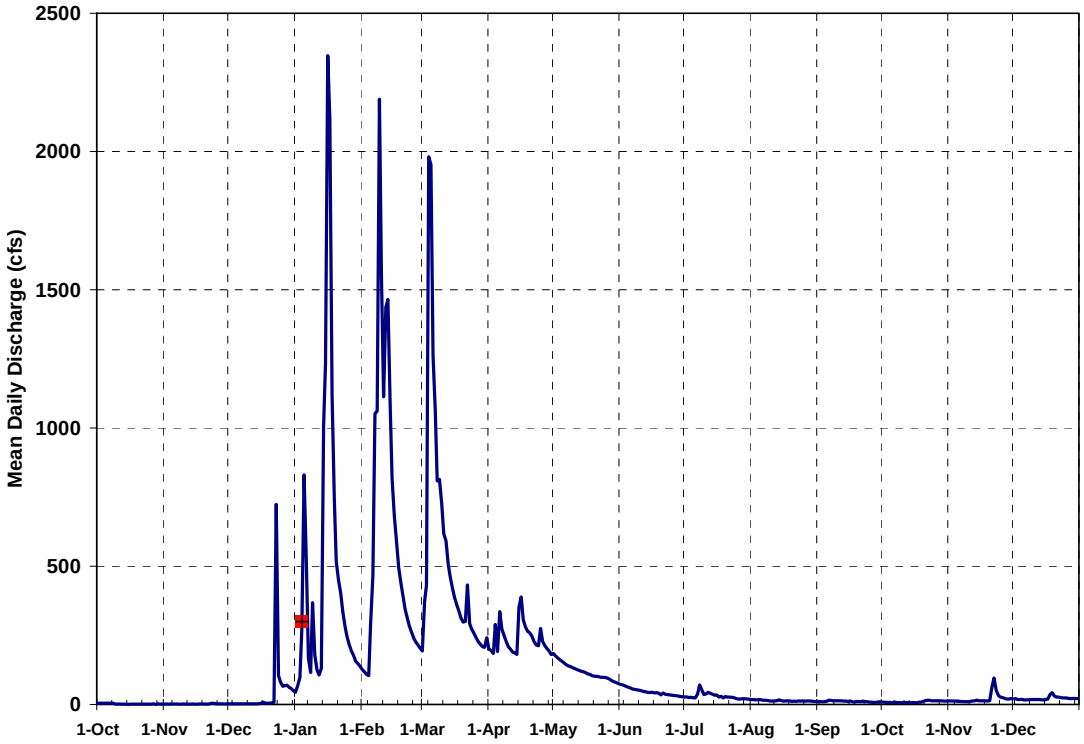


Figure 4. Mean daily flow hydrograph for WY1978. Sluicing event occurs on January 4 (red symbol).

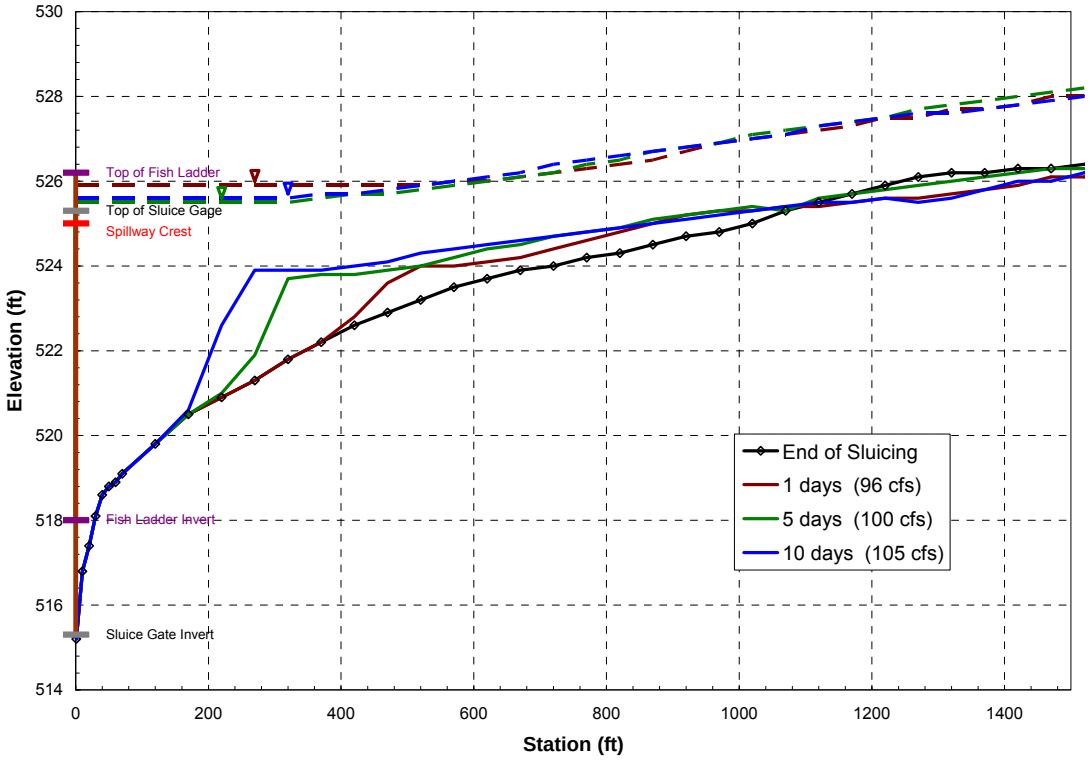


Figure 5a. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 1, 5 and 10 days after the sluicing event, 1978 hydrology.

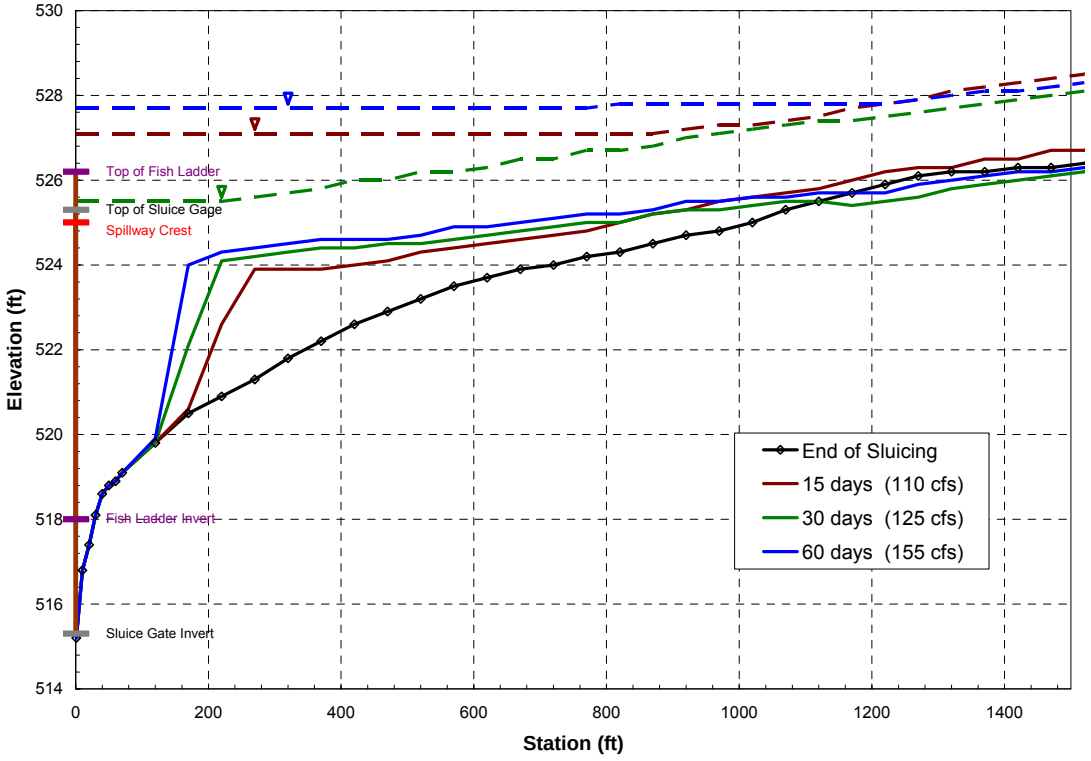


Figure 5b. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 15, 30 and 60 days after the sluicing event, 1978 hydrology.

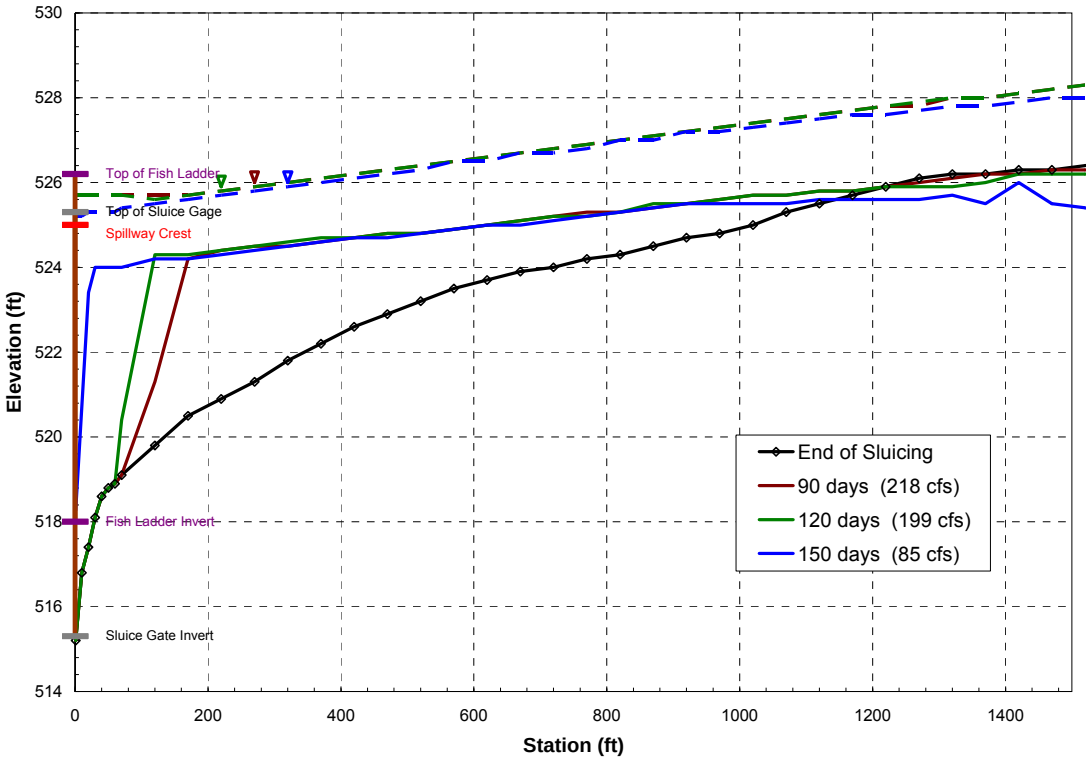


Figure 5c. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 90, 120 and 150 days after the sluicing event, 1978 hydrology.

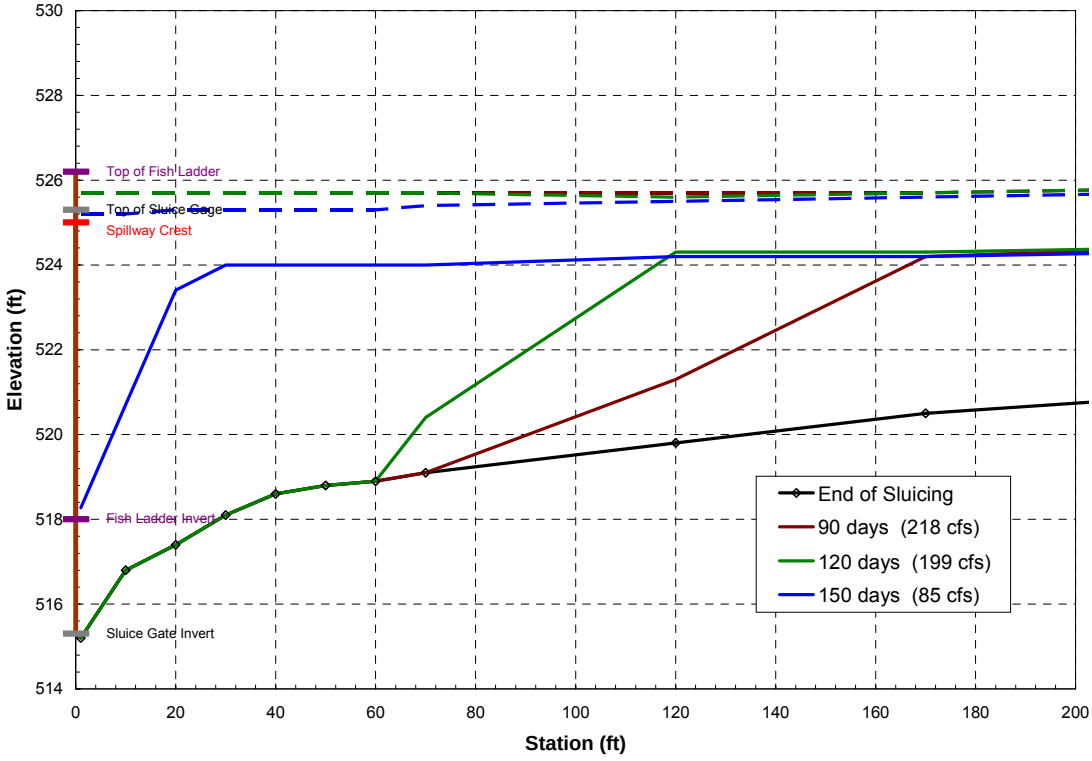


Figure 5c-1. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 90, 120 and 150 days after the sluicing event, 1978 hydrology, zoomed in on the downstream 200 feet of the incised channel.

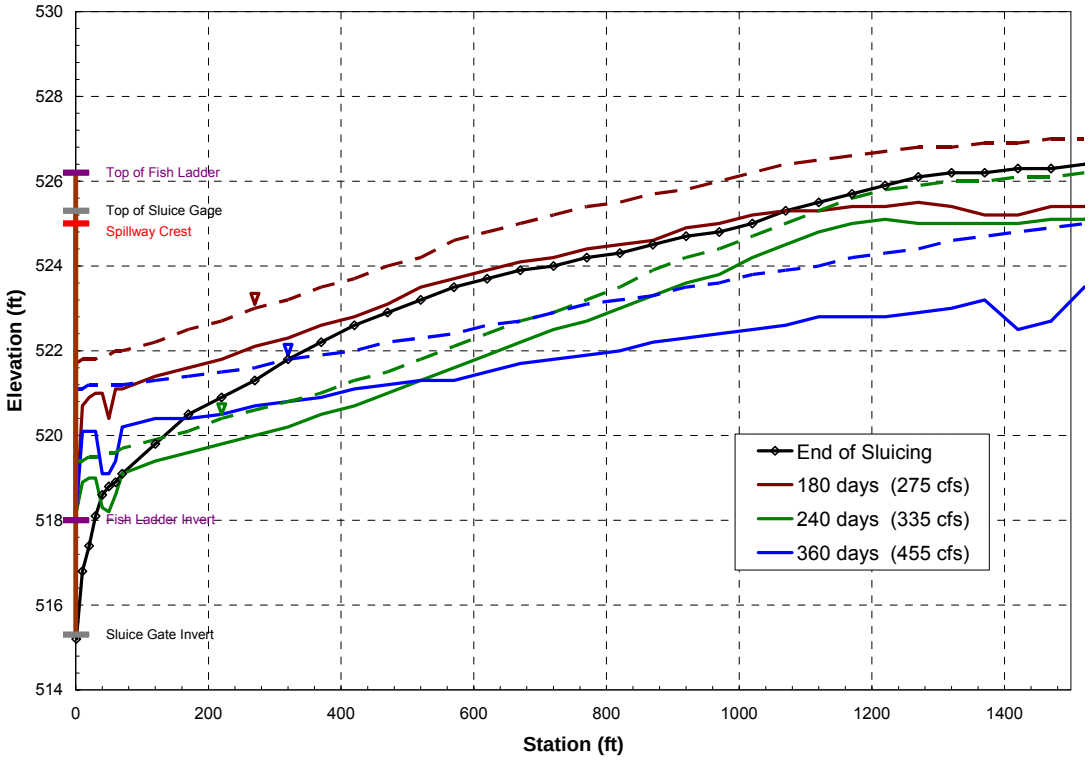


Figure 5d. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 180, 240 and 360 days after the sluicing event, 1978 hydrology.

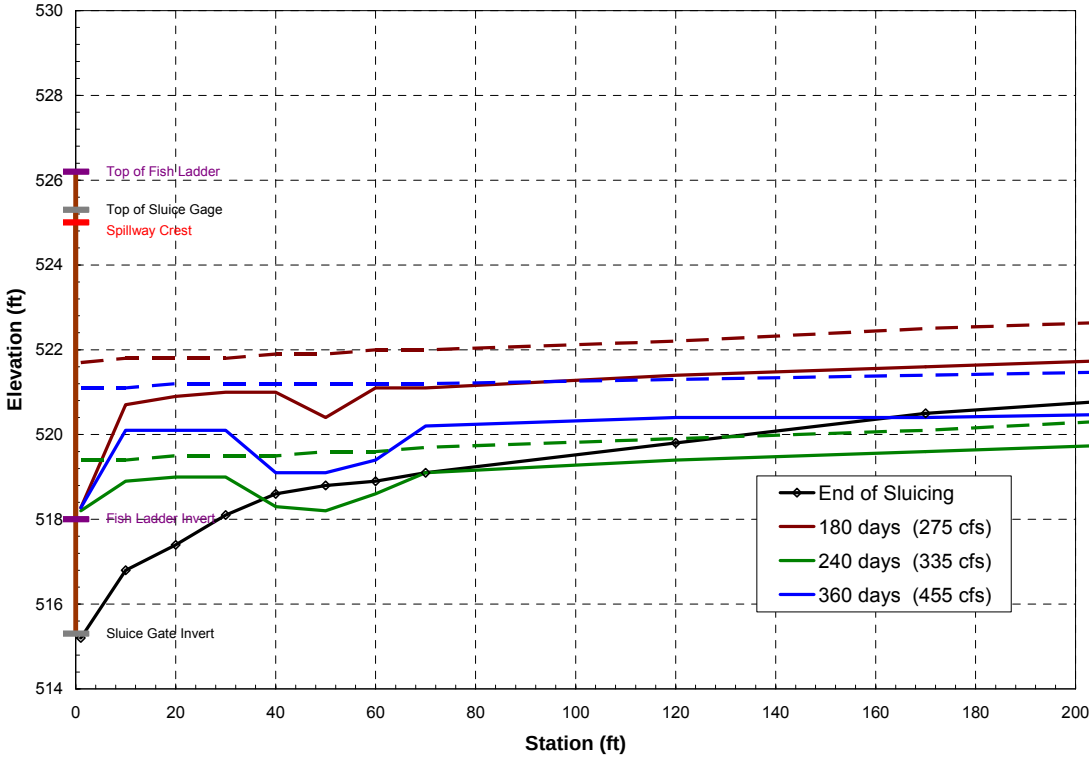


Figure 5d-1. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 180, 240 and 360 days after the sluicing event, 1978 hydrology, zoomed in on the downstream 200 feet of the incised channel.

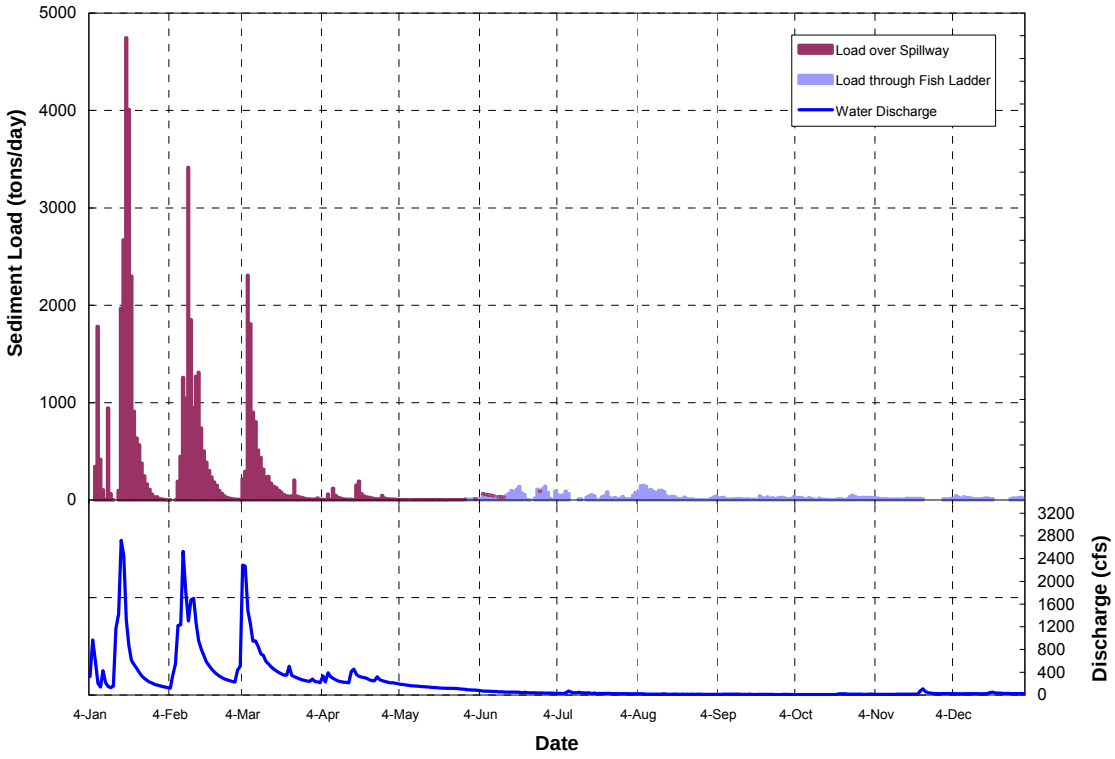


Figure 6. Sediment loads passing over the San Clemente Dam Spillway and through the fish ladder for the 1978 simulation. Also shown is the mean daily flow hydrograph for the simulation period.

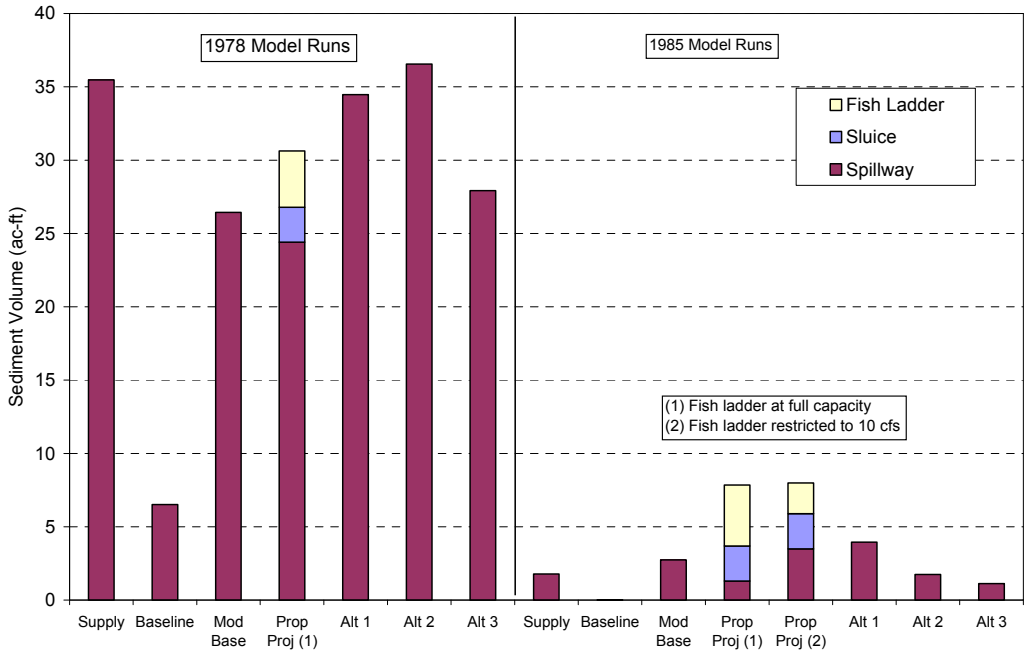


Figure 7. Total sediment volume passing San Clemente Dam between the date of the sluicing event (January 4, 1978; February 9, 1985) and the end of the calendar year for baseline, modified baseline (full reservoir), Proponents Proposed project, and Alternatives 1, 2 and 3 for 1985 and 1978 model runs. Also shown is the total upstream sediment supply to the reservoir.

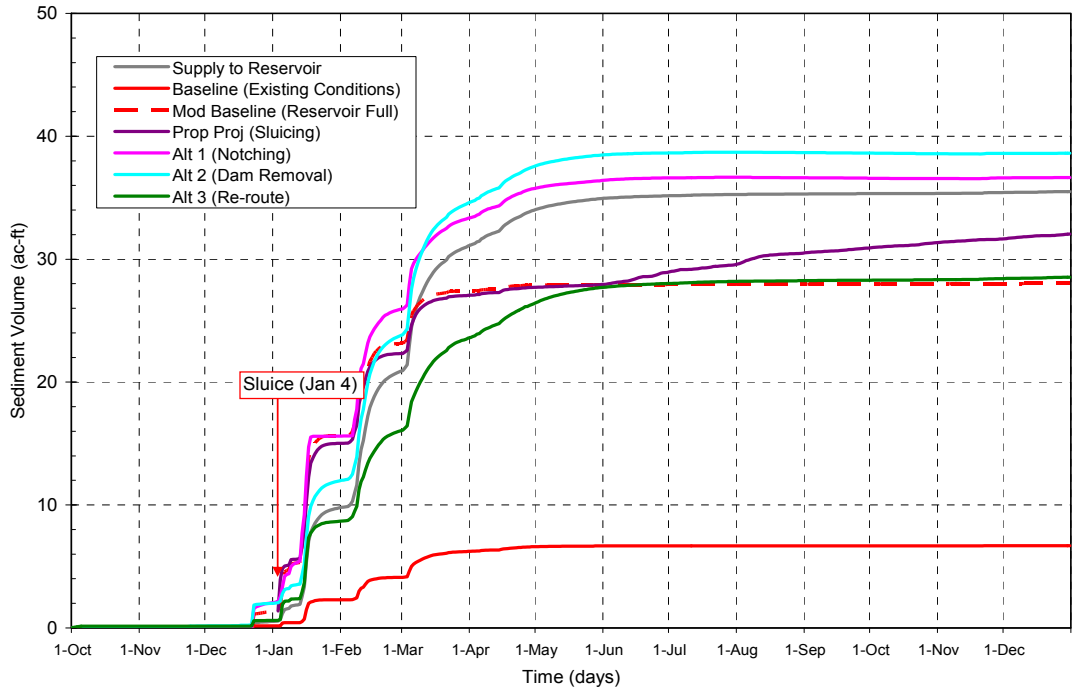


Figure 8. Cumulative sediment load passing San Clemente Dam from October 1, 1977, through December 31, 1978, for baseline and modified baseline (reservoir filled with sediment), Proponents Proposed Project, and Alternatives 1, 2 and 3).

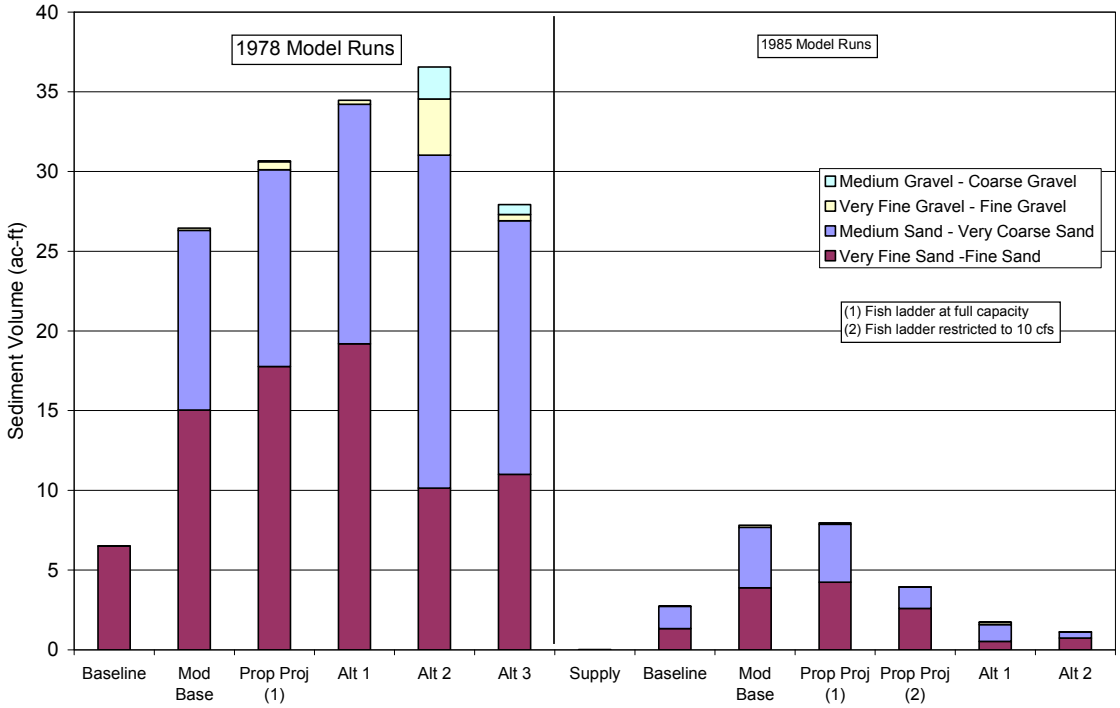


Figure 9. Size breakdown of sediment passing San Clemente Dam between the date of the sluicing event (January 4, 1978; February 9, 1985) and the end of the calendar year for baseline, modified baseline (full reservoir), Proponents Proposed project, and Alternatives 1, 2 and 3 for 1985 and 1978 model runs.

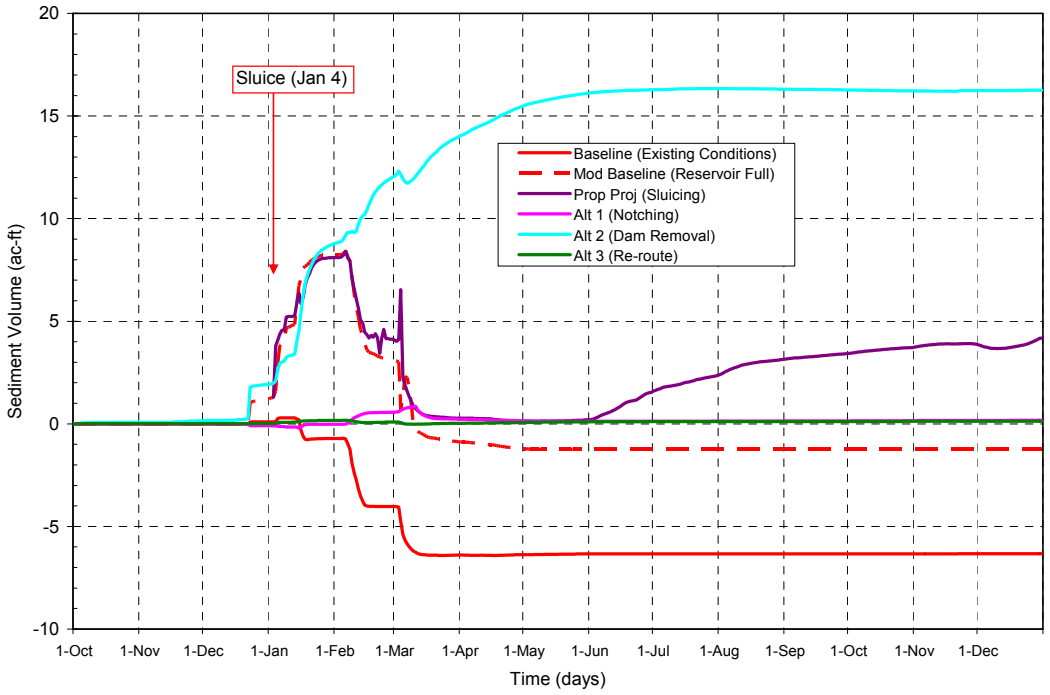


Figure 10. Change in sediment storage in the Carmel River between San Clemente Dam and the mouth between October 1, 1977, through December 31, 1978, for baseline and modified baseline (reservoir filled with sediment), Proponents Proposed Project, and Alternatives 1, 2 and 3).

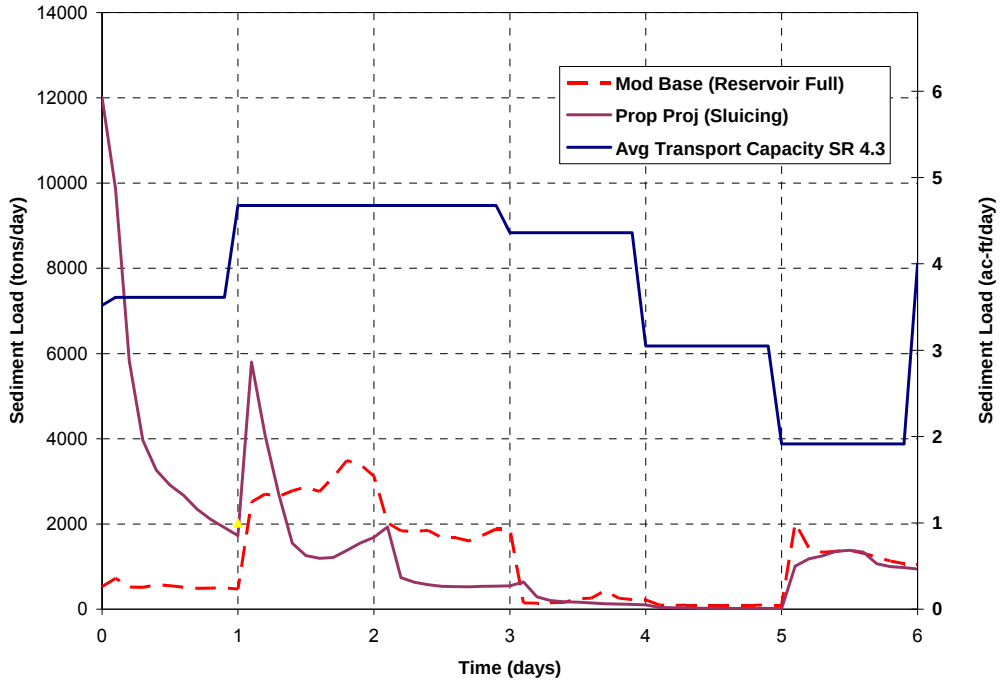


Figure 11. Sediment loads predicted by the model in the reach between San Clemente Dam and Old San Clemente Dam during the first six days after the sluicing event for the 1978 hydrology. Also shown are the predicted loads under the modified baseline (full reservoir) scenario and the transport capacity assuming an unlimited bed sediment reservoir.

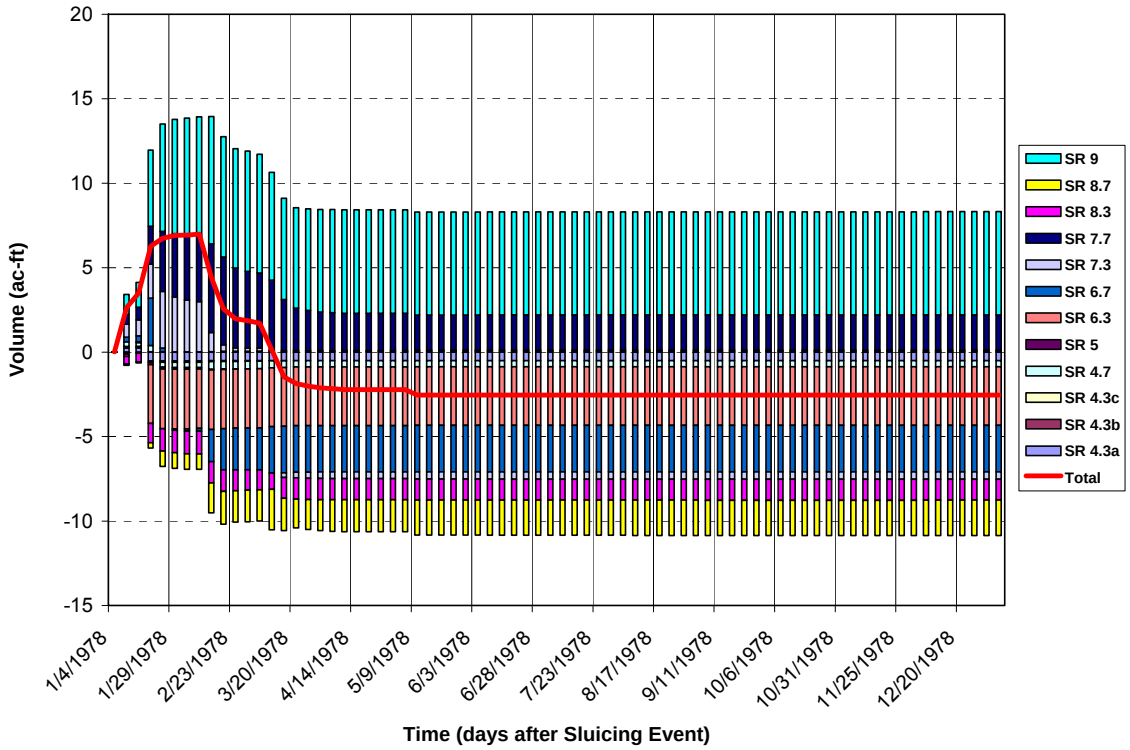


Figure 12. Change in sediment storage in the Carmel River downstream from San Clemente Dam, by subreach, from January 4 through December 31 for the 1978 hydrology for the modified baseline (full reservoir) scenario.

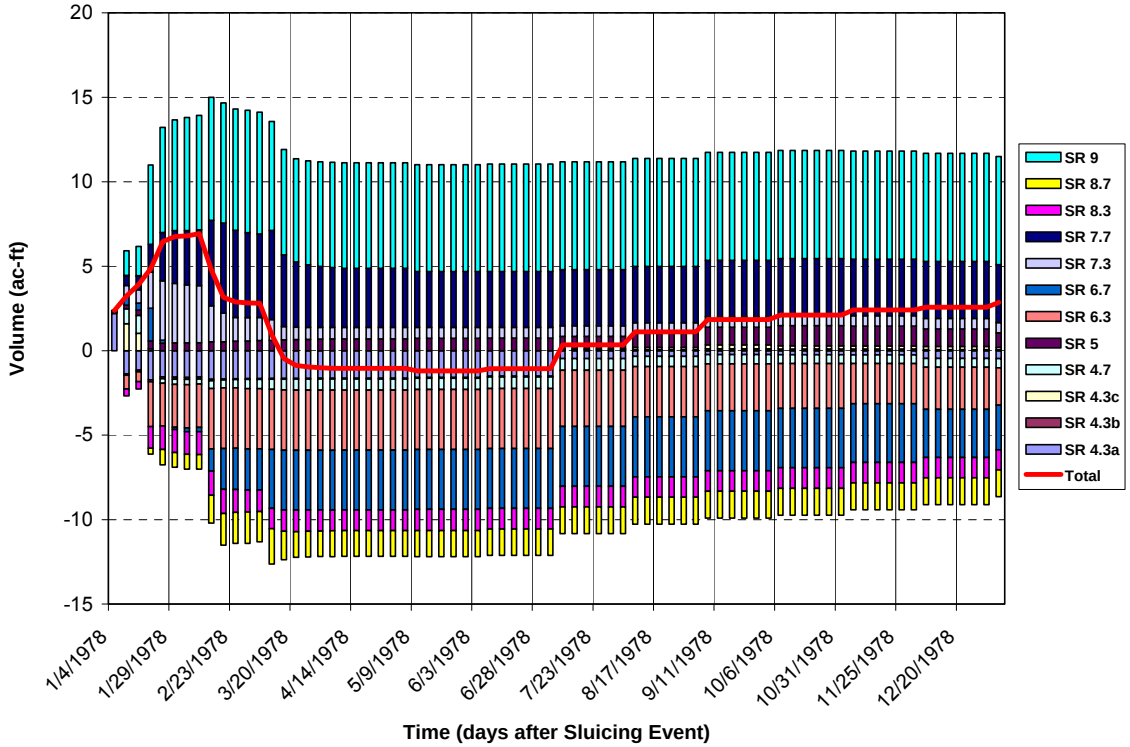


Figure 13. Change in sediment storage in the Carmel River downstream from San Clemente Dam, by subreach, from the end of the sluicing event on January 4 through December 31 for the 1978 hydrology for the Proponents Proposed Project (Sluicing).

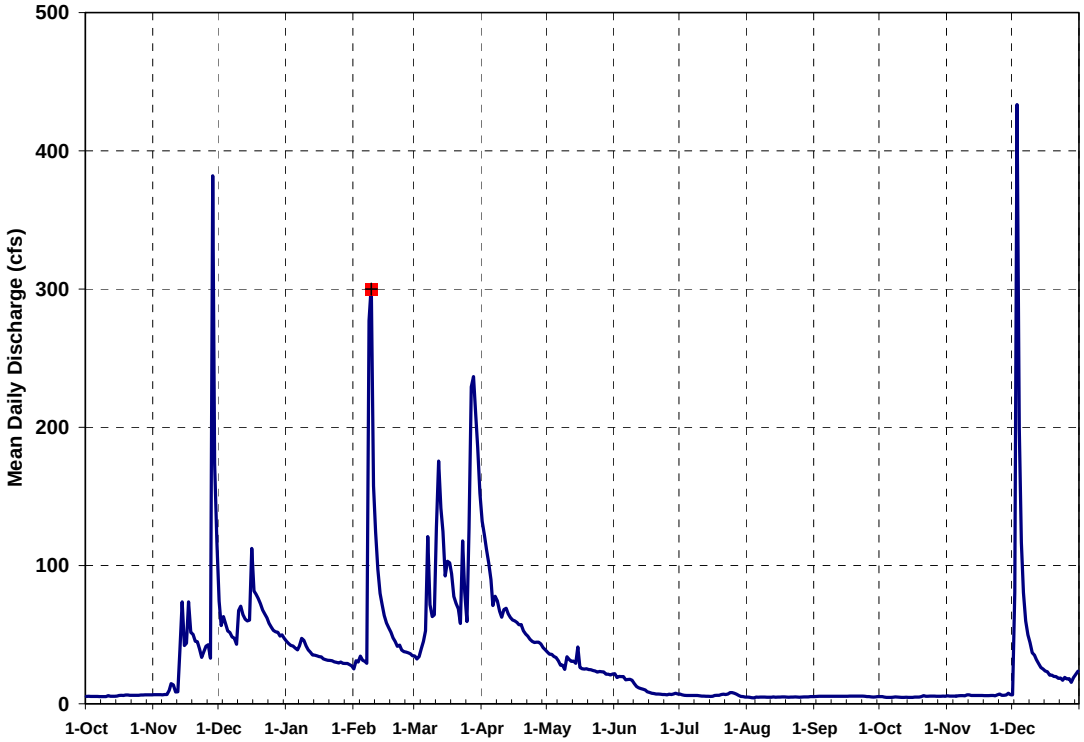


Figure 14. Mean daily flow hydrograph for WY1985. Sluicing event occurs on February 9 (red symbol).

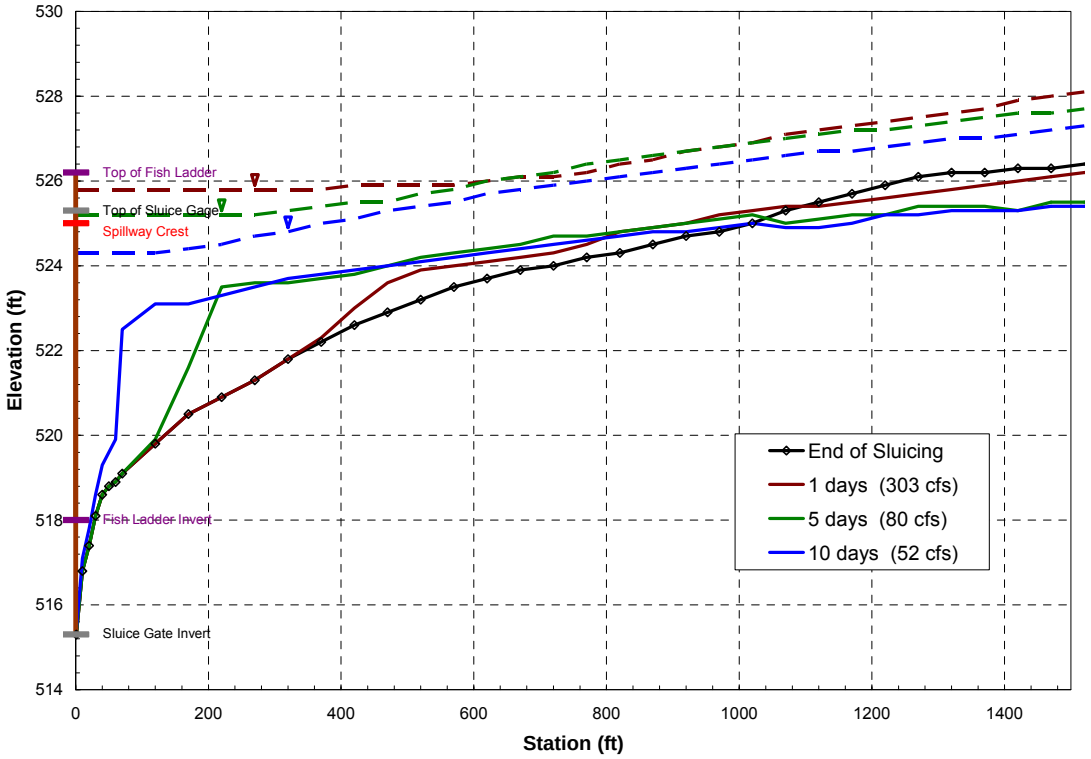


Figure 15a. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 1, 5 and 10 days after the sluicing event, 1985 hydrology with fish ladder at full capacity.

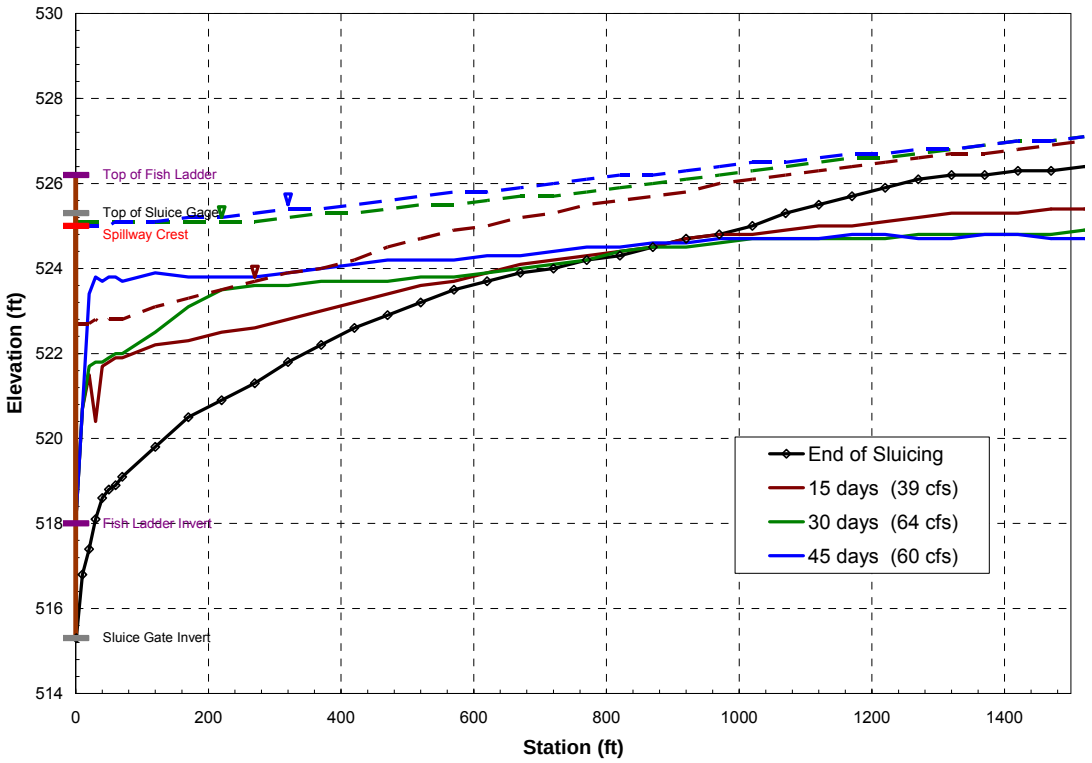


Figure 15b. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 15, 30 and 45 days after the sluicing event, 1985 hydrology with fish ladder at full capacity.

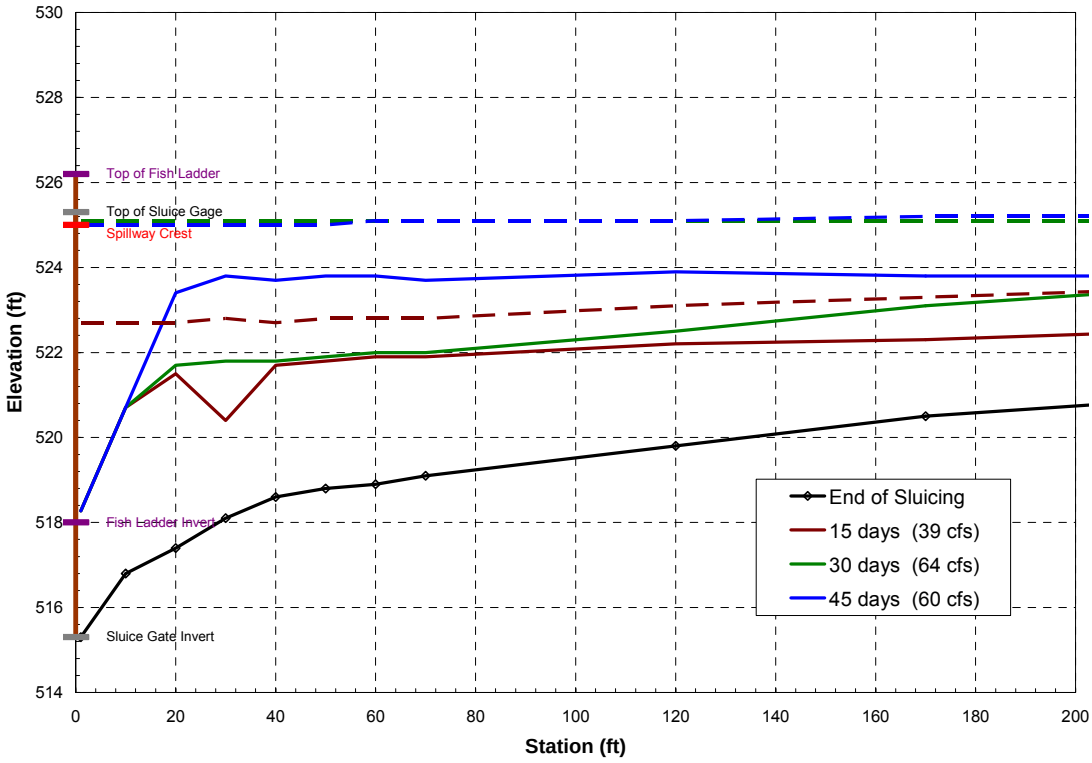


Figure 15b-1. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 15, 30 and 45 days after the sluicing event, 1985 hydrology with fish ladder at full capacity, zoomed in on the downstream 200 feet of the incised channel.

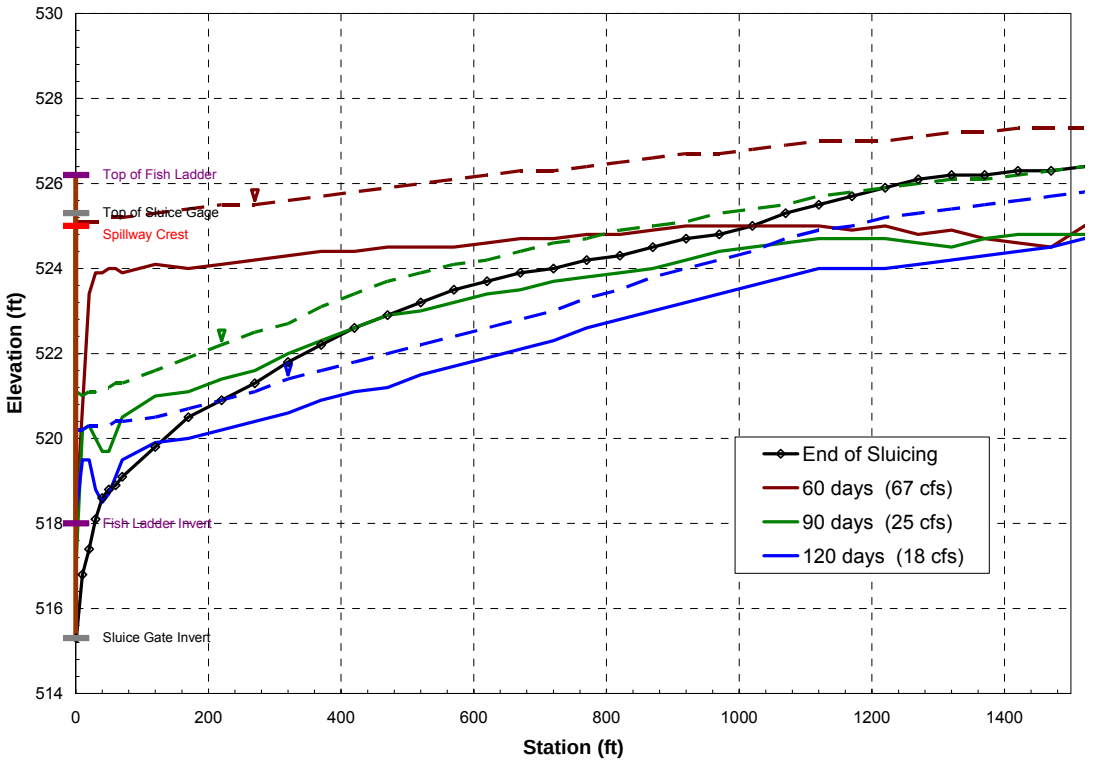


Figure 15c. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 60, 90 and 120 days after the sluicing event, 1985 hydrology with fish ladder at full capacity.

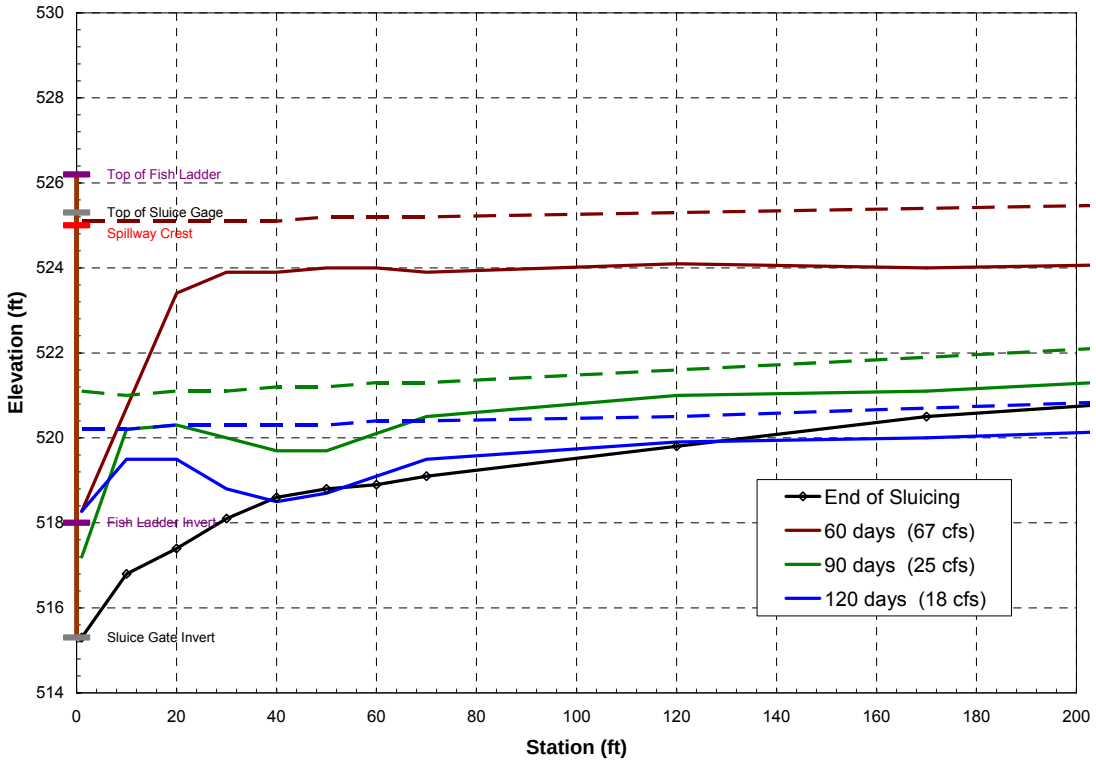


Figure 15c-1. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 60, 90 and 120 days after the sluicing event, 1985 hydrology with fish ladder at full capacity, zoomed in on the downstream 200 feet of the incised channel.

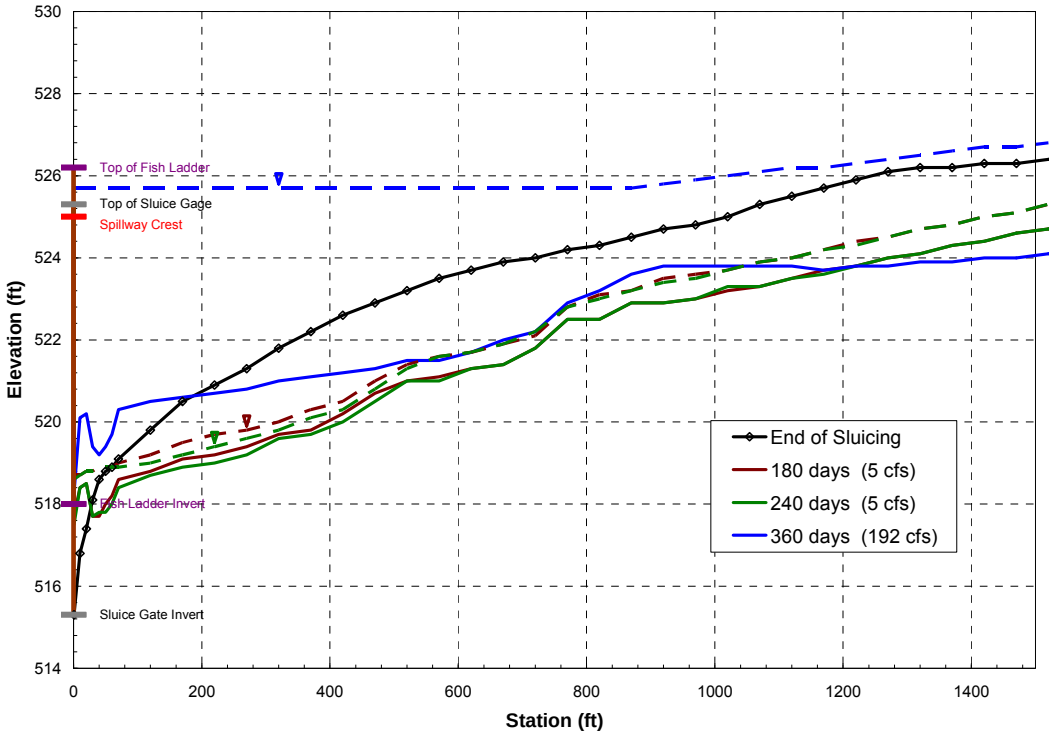


Figure 15d. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 180, 240 and 360 days after the sluicing event, 1985 hydrology with fish ladder at full capacity.

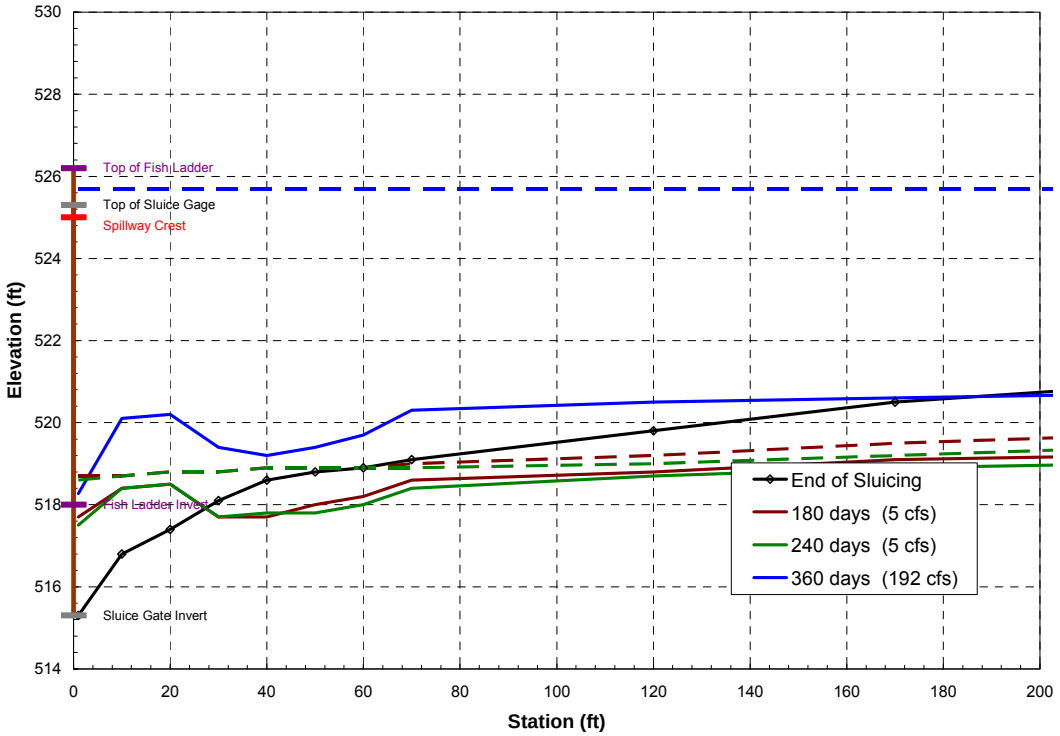


Figure 15d-1. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 180, 240 and 360 days after the sluicing event, 1985 hydrology with fish ladder at full capacity, zoomed in on the downstream 200 feet of the incised channel.

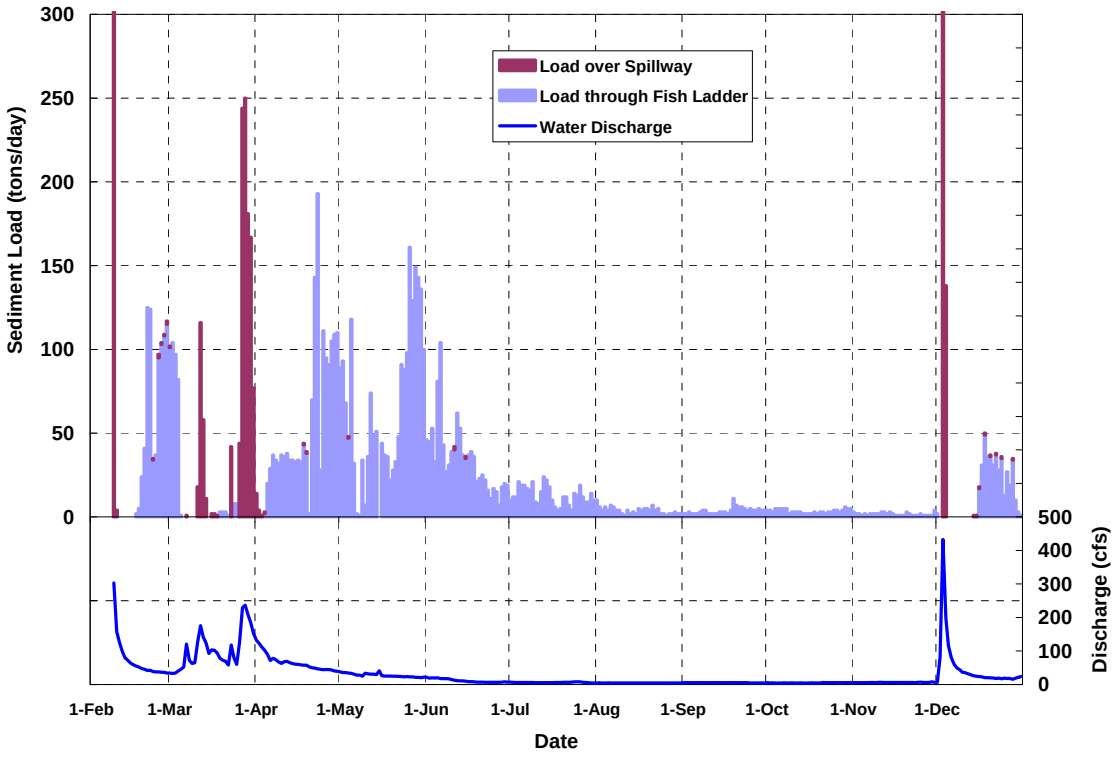


Figure 16. Sediment loads passing over the San Clemente Dam Spillway and through the fish ladder for the 1985 simulation. Also shown is the mean daily flow hydrograph for the simulation period.

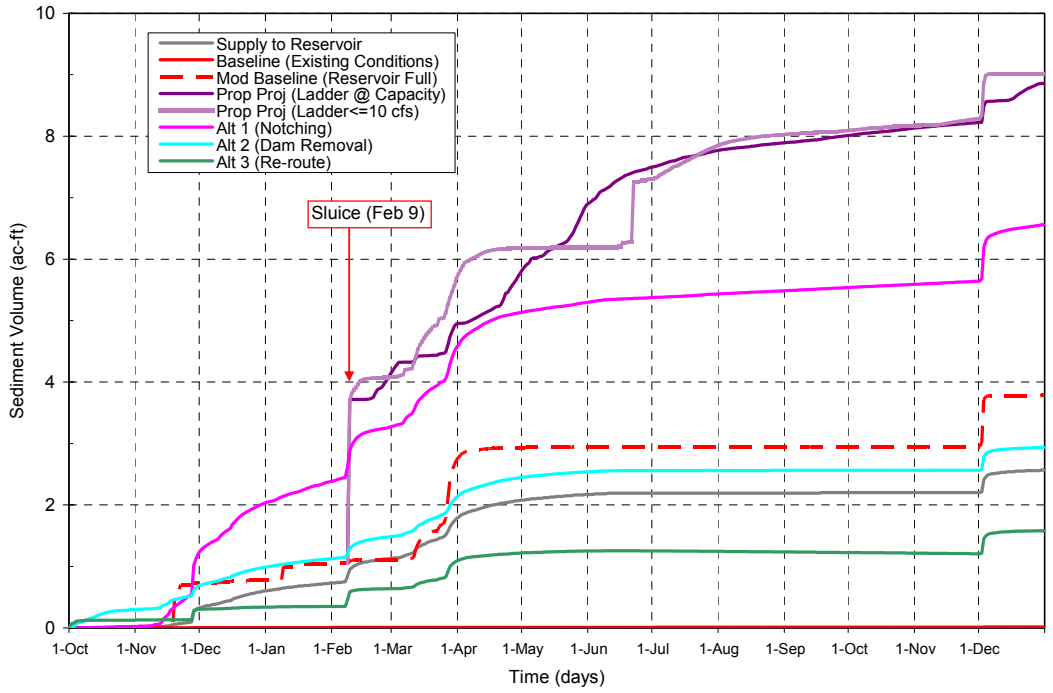


Figure 17. Cumulative sediment load passing San Clemente Dam from October 1, 1985, through December 31, 1985, for baseline and modified baseline (reservoir filled with sediment), Proponents Proposed Project, and Alternatives 1, 2 and 3).

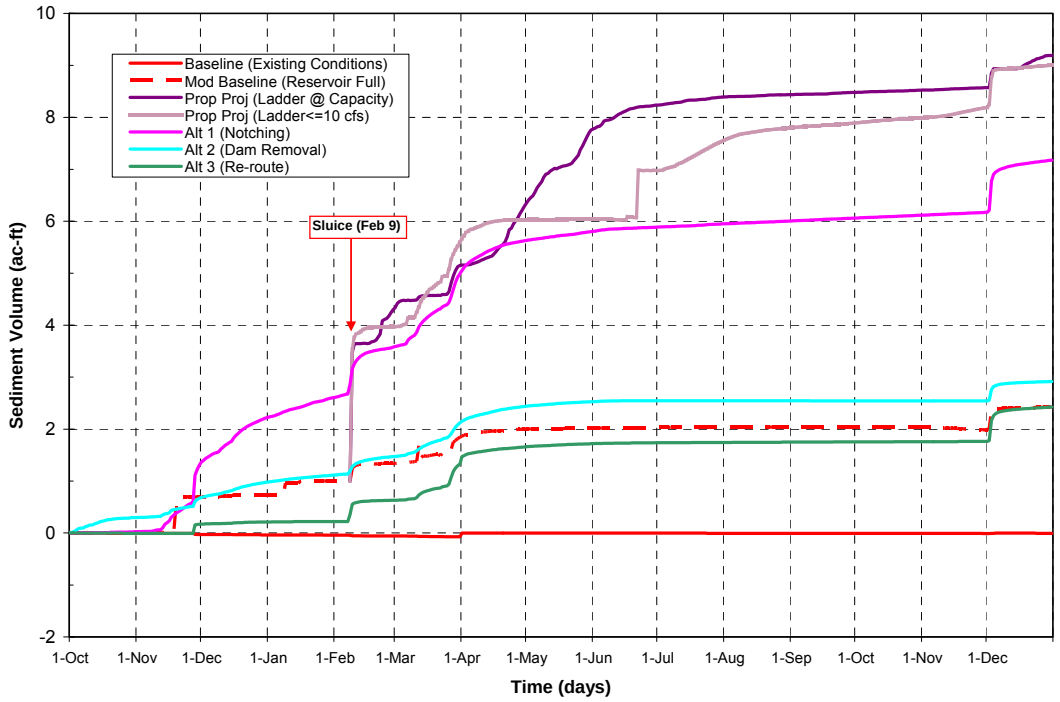


Figure 18. Change in sediment storage in the Carmel River between San Clemente Dam and the mouth between October 1, 1985, through December 31, 1985, for baseline and modified baseline (reservoir filled with sediment), Proponents Proposed Project, and Alternatives 1, 2 and 3).

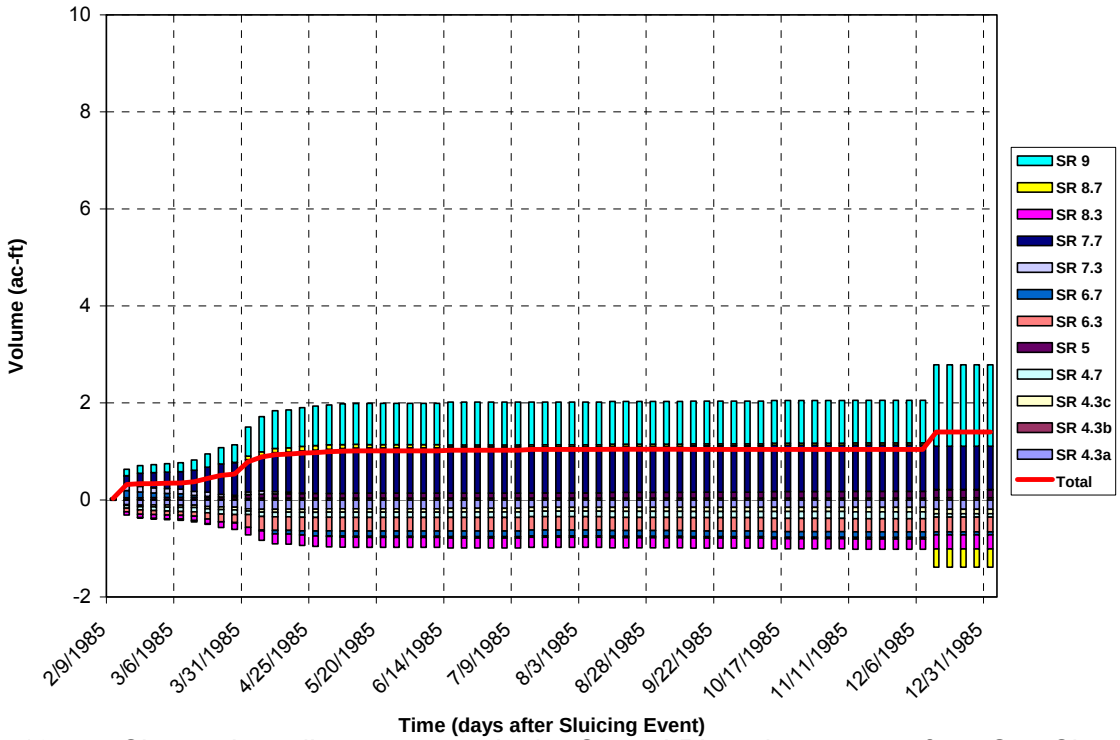


Figure 19. Change in sediment storage in the Carmel River downstream from San Clemente Dam, by subreach, from February 9 through December 31 for the 1985 hydrology for the modified baseline (full reservoir) scenario.

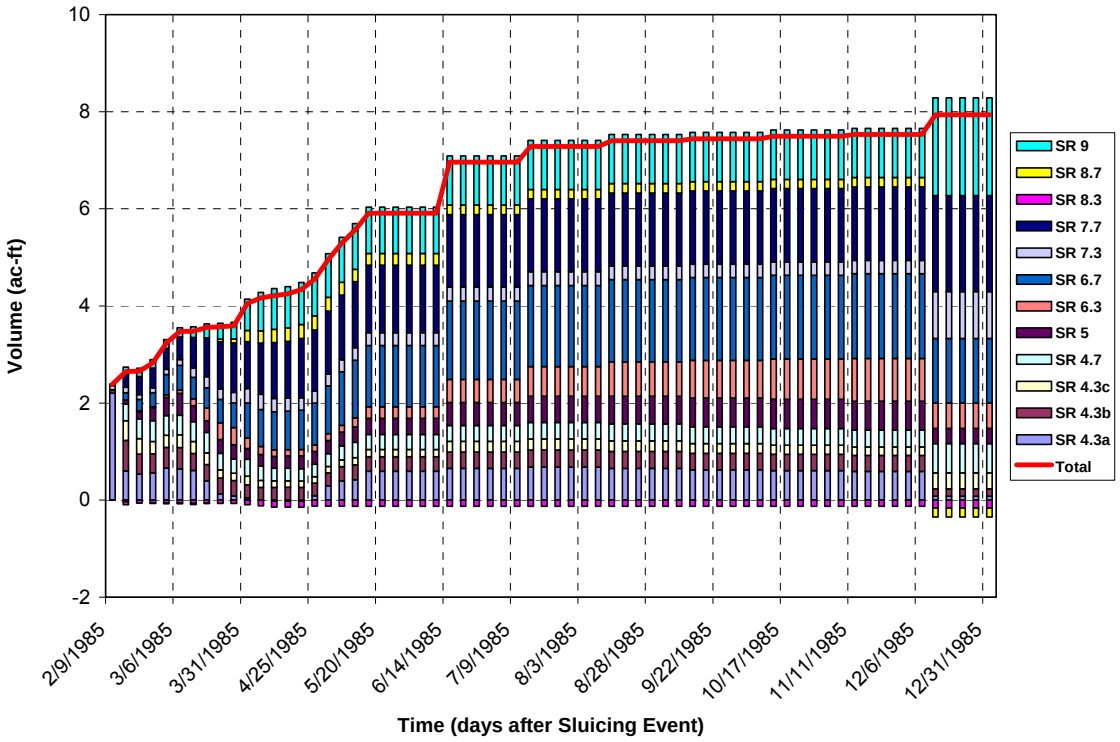


Figure 20. Change in sediment storage in the Carmel River downstream from San Clemente Dam, by subreach, from the end of the sluicing event on February 9 through December 31 for the 1985 hydrology for the Proponents Proposed Project (Sluicing), with the fish ladder operating at full capacity.

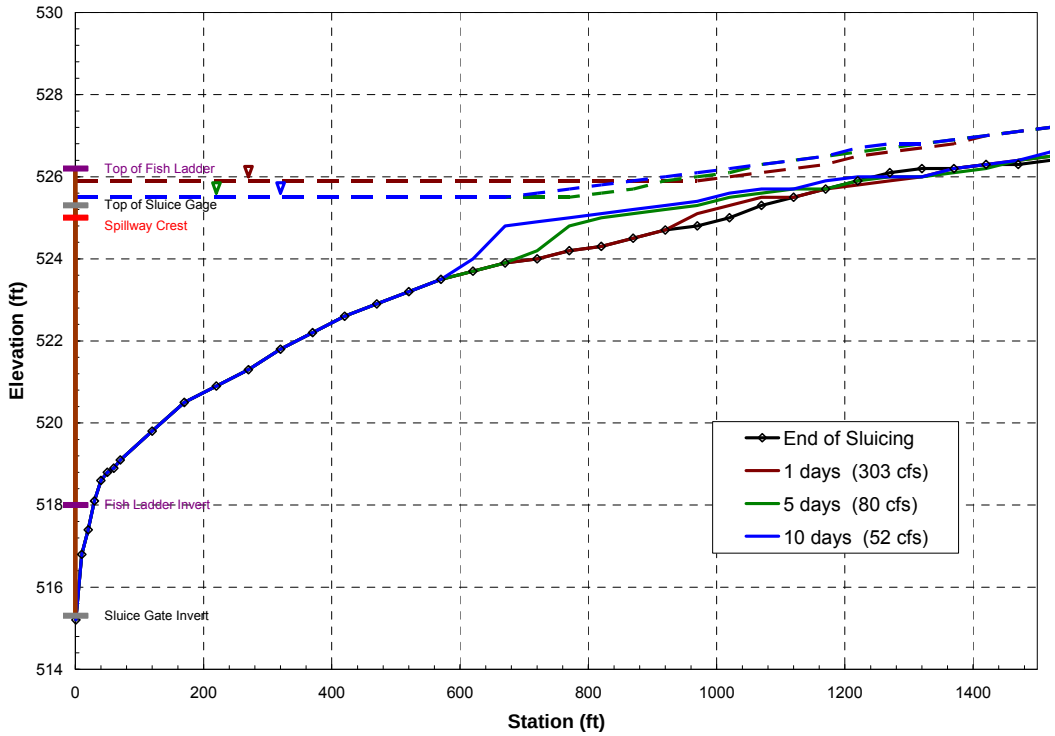


Figure 21a. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 1, 5 and 10 days after the sluicing event, 1985 hydrology with fish ladder restricted to 10 cfs or less.

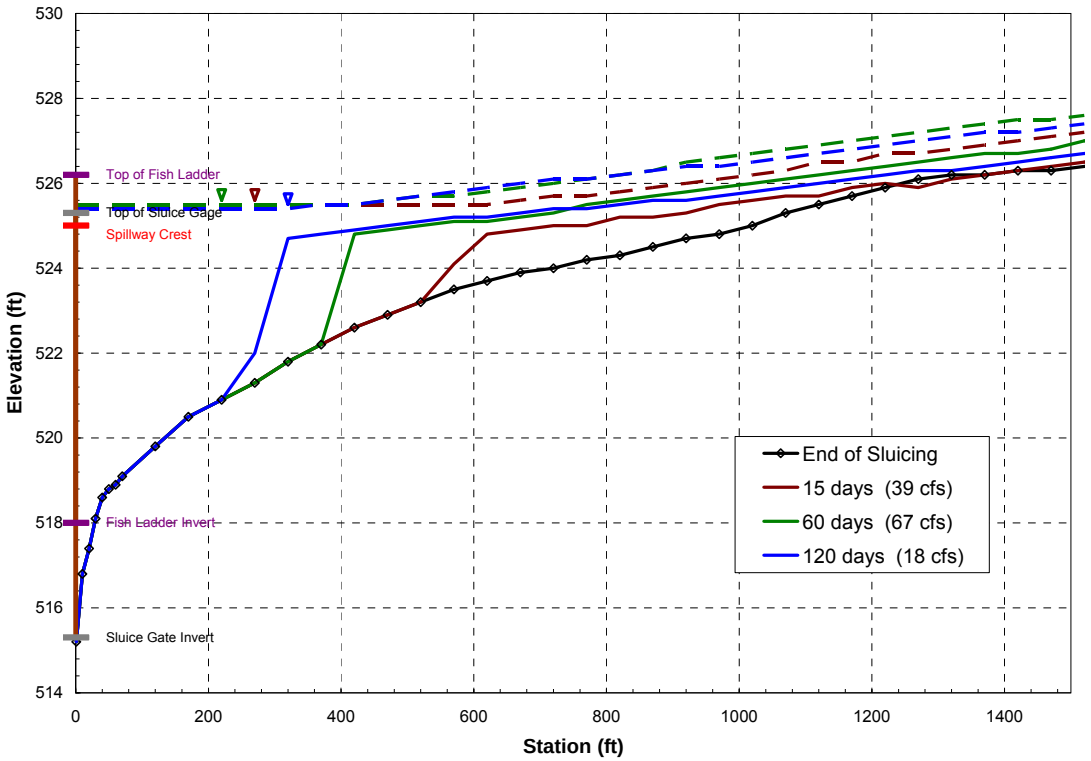


Figure 21b. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 15, 60 and 120 days after the sluicing event, 1985 hydrology with fish ladder restricted to 10 cfs or less.

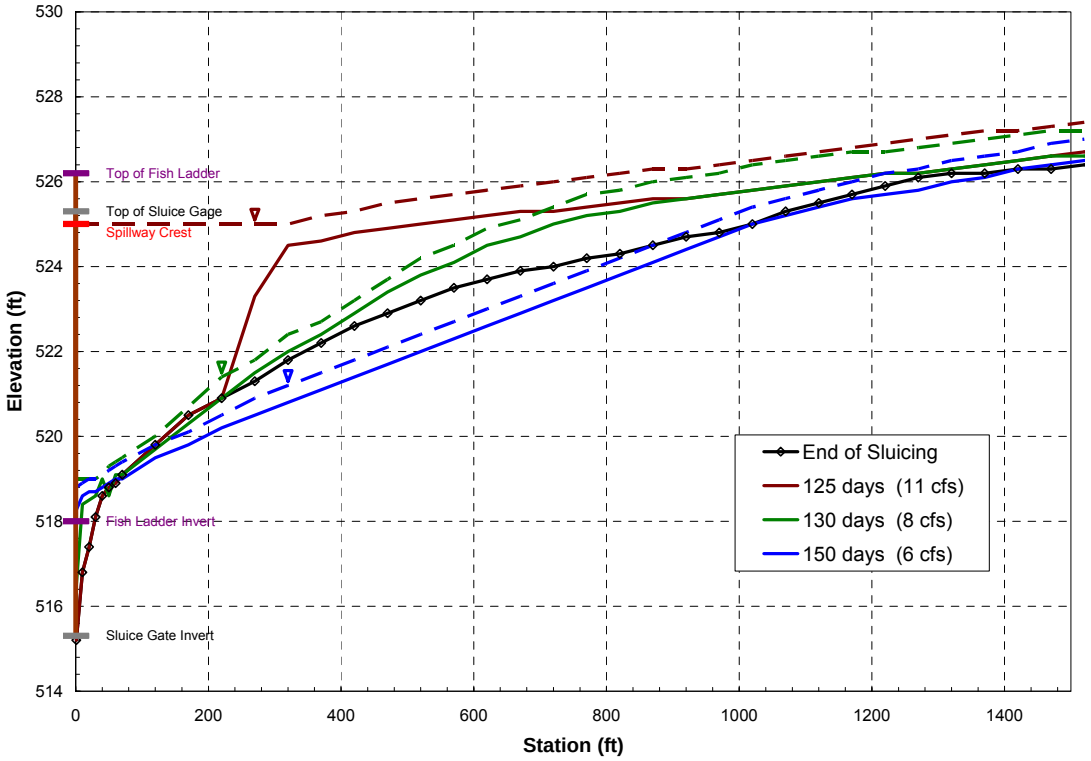


Figure 21c. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 125, 130 and 150 days after the sluicing event, 1985 hydrology with fish ladder restricted to 10 cfs or less.

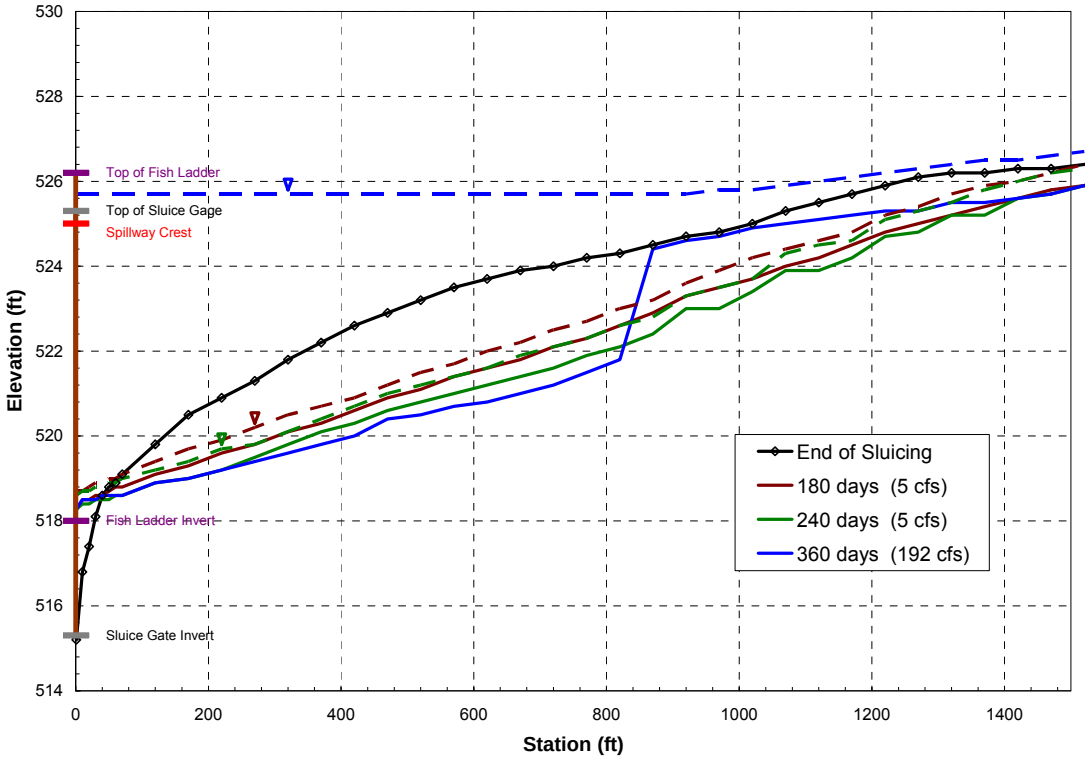


Figure 21d. Longitudinal profile of the incised channel upstream from the sluice gage at the end of the sluicing event, and 180, 240 and 360 days after the sluicing event, 1985 hydrology with fish ladder restricted to 10 cfs or less.

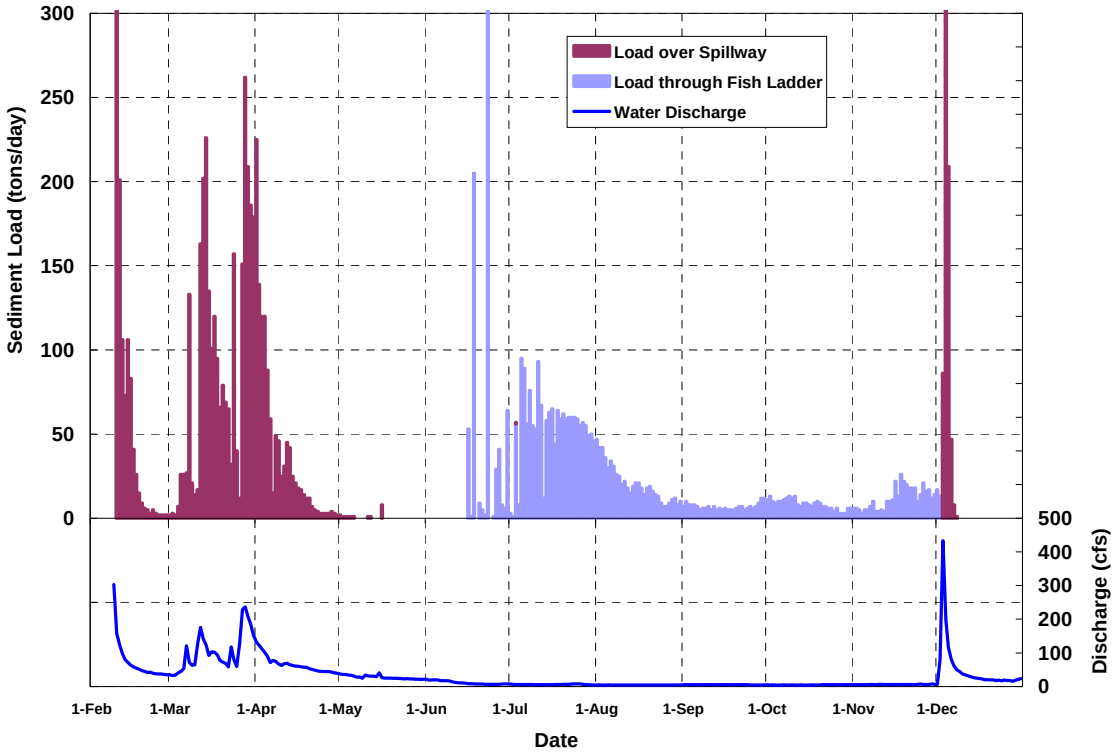


Figure 22. Sediment loads passing over the San Clemente Dam Spillway and through the fish ladder for the 1985 simulation. Also shown is the mean daily flow hydrograph for the simulation period (fish ladder discharge ≤0 cfs).

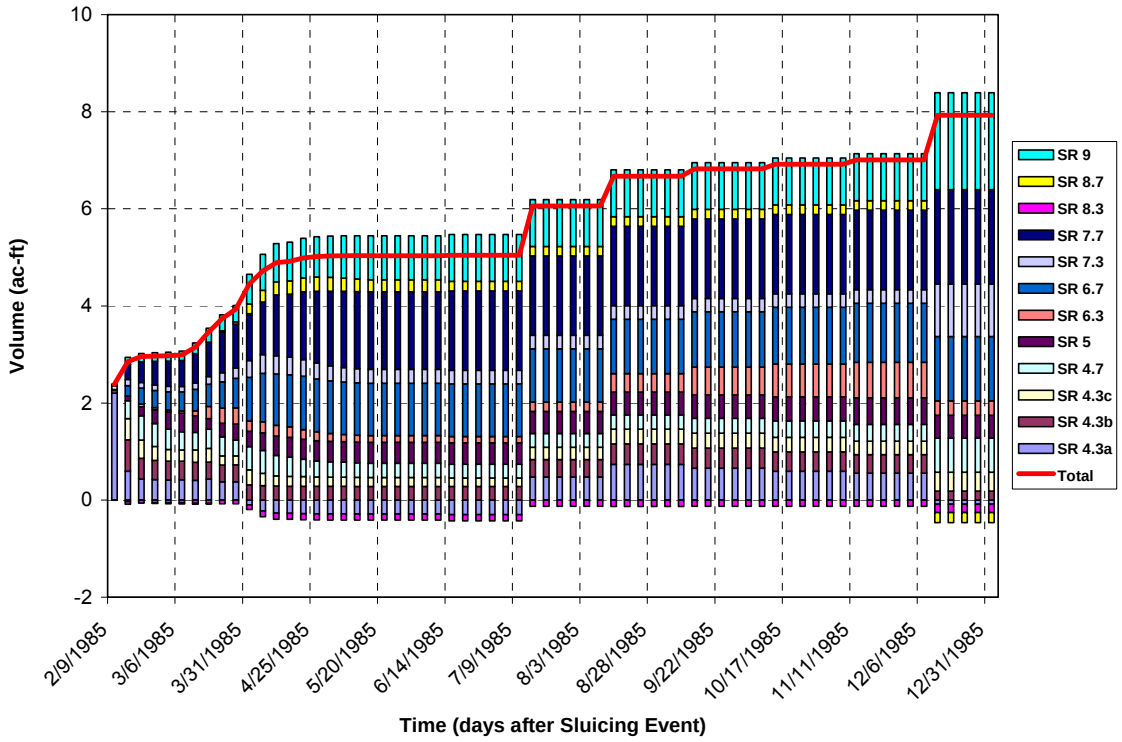


Figure 23. Change in sediment storage in the Carmel River downstream from San Clemente Dam, by subreach, from the end of the sluicing event on February 9 through December 31 for the 1985 hydrology for the Proponents Proposed Project (Sluicing), with the fish ladder restricted to 10 cfs or less.

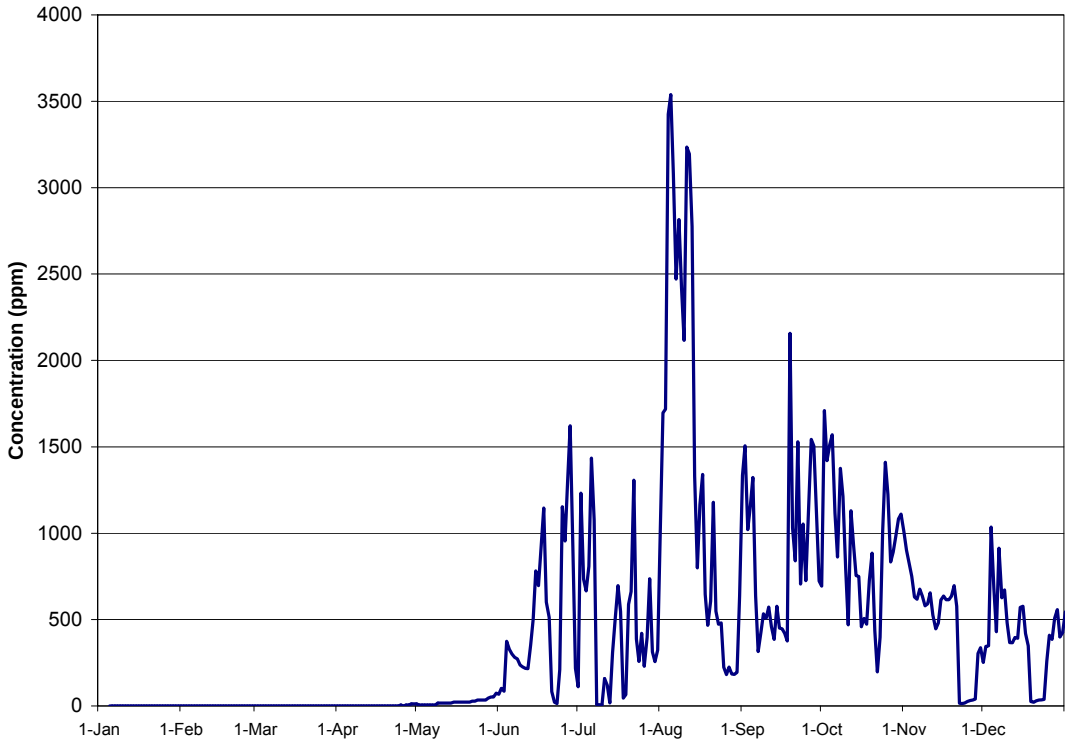


Figure 24. Total sediment concentrations in the fish ladder under the Proposed Project for the 1978 hydrology scenario.

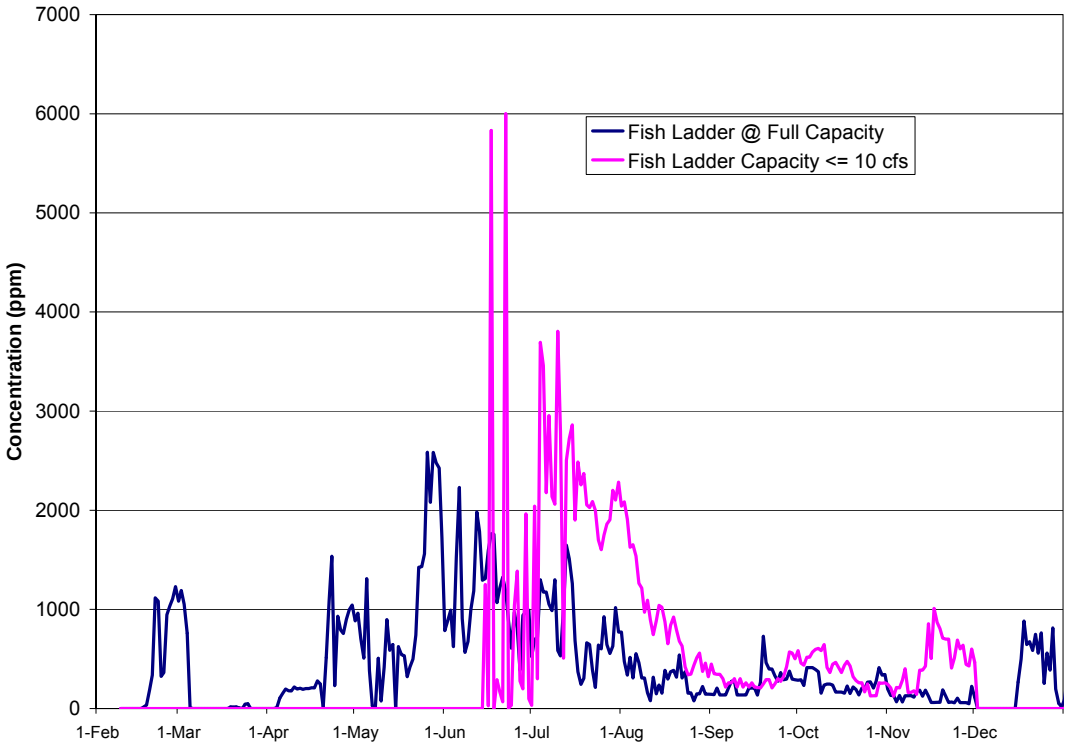


Figure 25. Total sediment concentrations in the fish ladder under the Proposed Project for the 1985 hydrology scenario with the fish ladder operating at full capacity, and with the fish ladder capacity restricted to 10 cfs or less.

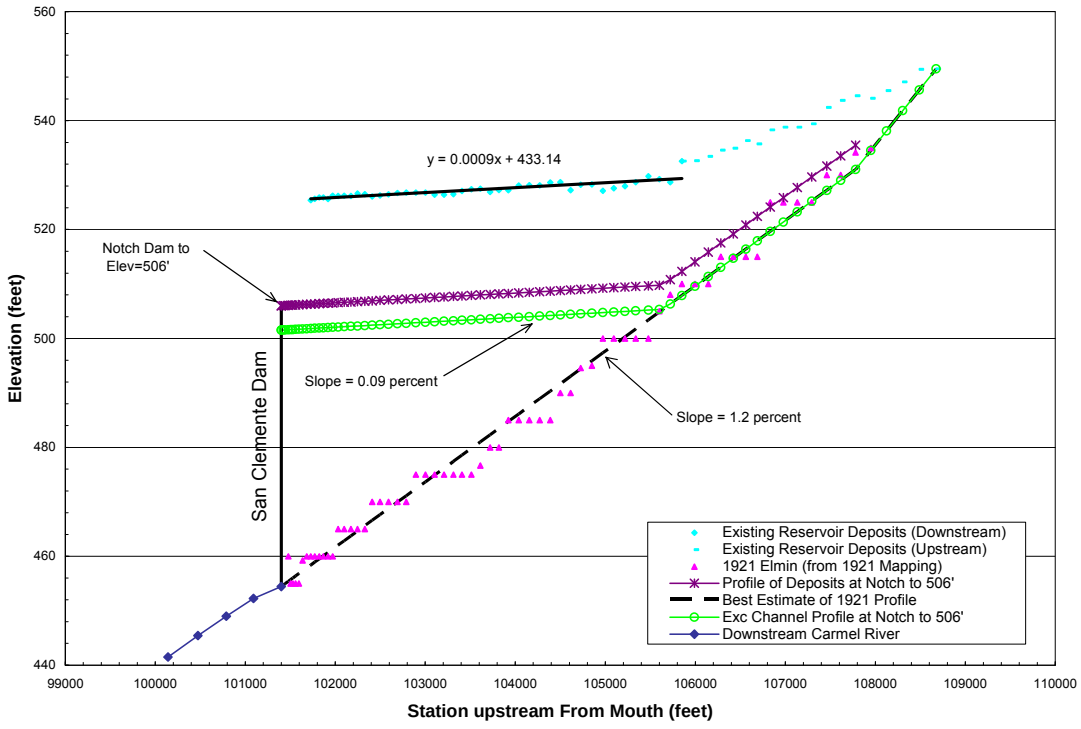


Figure 26. Longitudinal profile of the existing reservoir deposits, the pre-dam surface, and the constructed profile under the Notching Alternative in the Carmel Branch of San Clemente Reservoir.

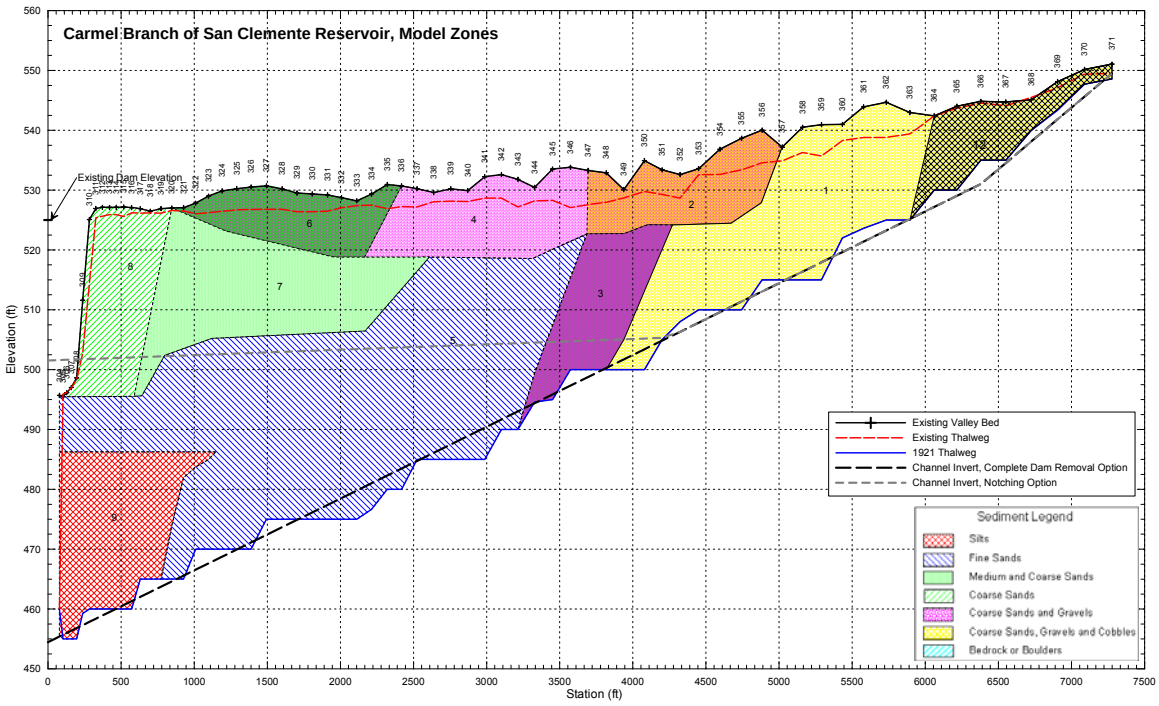


Figure 27. Profile of reservoir sediment zones and the channel invert for the Complete Dam Removal Alternative and for the Notching Alternative, Carmel Branch of San Clemente Reservoir.

Table 1. Total and maximum consecutive number of days during the 41-year simulation period that suspended sediment concentration above 6 inches above the bed exceeds 500 and 2,000 ppm.								
Subreach	Baseline		Alternative 1 (Dam Notching)		Alternative 2 (Complete Dam Removal)		Alternative 3 (Carmel River Re-route)	
	1978	1985	1978	1985	1978	1985	1978	1985
	Total number days concentration exceeds 500 ppm							
R4.3	22	27	23	23	42	41	33	27
R4.7	21	23	23	23	33	35	29	27
R5	24	28	25	30	33	40	30	29
R6.3	28	30	29	31	34	38	34	33
R6.7	30	38	36	36	40	41	38	38
R7.3	32	42	38	38	40	43	42	38
R7.7	33	40	37	40	39	44	38	38
R8.3	30	35	30	33	35	38	33	33
R8.7	33	36	33	35	34	41	36	38
R9	31	33	37	36	33	39	35	37
	Maximum consecutive days concentration exceeds 500 ppm							
R4.3	3	3	3	3	5	5	4	4
R4.7	3	3	3	3	4	4	4	4
R5	4	4	4	4	4	5	4	4
R6.3	4	4	4	4	4	4	4	4
R6.7	4	4	4	5	4	5	4	4
R7.3	4	5	4	4	4	5	5	4
R7.7	4	4	4	4	5	5	5	4
R8.3	4	4	4	4	4	5	4	4
R8.7	4	5	4	5	4	5	4	5
R9	4	4	4	5	4	5	4	5
	Total number days concentration exceeds 2000 ppm							
R4.3	0	0	0	0	0	1	0	0
R4.7	0	0	0	0	0	0	0	0
R5	1	1	1	1	1	1	1	1
R6.3	1	1	1	1	1	1	1	1
R6.7	1	1	1	1	1	1	1	1
R7.3	1	1	1	1	1	1	1	1
R7.7	1	1	1	1	1	1	1	1
R8.3	1	1	1	1	1	1	1	1
R8.7	1	1	1	1	1	1	1	1
R9	1	1	1	1	1	1	1	1
	Maximum consecutive days concentration exceeds 2000 ppm							
R4.3	0	0	0	0	0	1	0	0
R4.7	0	0	0	0	0	0	0	0
R5	1	1	1	1	1	1	1	1
R6.3	1	1	1	1	1	1	1	1
R6.7	1	1	1	1	1	1	1	1
R7.3	1	1	1	1	1	1	1	1
R7.7	1	1	1	1	1	1	1	1
R8.3	1	1	1	1	1	1	1	1
R8.7	1	1	1	1	1	1	1	1
R9	1	1	1	1	1	1	1	1

Table 2. Total and maximum consecutive number of days suspended sediment concentration above 6 inches above the bed exceeds 500 and 2,000 ppm for remainder of equivalent calender year after sluicing.

Subreach	Baseline		Modified Baseline (Full Reservoir)		Sluicing		Alternative 1 (Dam Notching)		Alternative 2 (Complete Dam Removal)		Alternative 3 (Carmel River Re-route)	
	1978	1985	1978	1985	1978	1985	1978	1985	1978	1985	1978	1985
	Total number days concentration exceeds 500 ppm											
R4.3a	0	0	0	0	7	5	0	0	1	0	0	0
R4.3b					6	11						
R4.3c					3	4						
R4.7	0	0	0	0	0	0	0	0	0	0	0	0
R5	0	0	0	0	0	0	0	0	0	0	0	0
R6.3	0	0	1	0	1	0	0	0	0	0	1	0
R6.7	0	0	2	0	2	0	1	0	1	0	1	0
R7.3	0	0	2	0	0	0	3	0	0	0	2	0
R7.7	0	0	1	0	0	0	0	0	0	0	0	0
R8.3	0	0	1	0	0	0	0	0	0	0	0	0
R8.7	0	0	1	0	0	0	1	0	0	0	0	0
R9	0	0	1	0	0	0	3	0	0	0	0	0
	Maximum consecutive days concentration exceeds 500 ppm											
R4.3a	0	0	0	0	3	2	0	0	1	0	0	0
R4.3b					2	3						
R4.3c					2	2						
R4.7	0	0	0	0	0	0	0	0	0	0	0	0
R5	0	0	0	0	0	0	0	0	0	0	0	0
R6.3	0	0	1	0	1	0	0	0	0	0	1	0
R6.7	0	0	2	0	2	0	1	0	1	0	1	0
R7.3	0	0	2	0	0	0	2	0	0	0	2	0
R7.7	0	0	1	0	0	0	0	0	0	0	0	0
R8.3	0	0	1	0	0	0	0	0	0	0	0	0
R8.7	0	0	1	0	0	0	1	0	0	0	0	0
R9	0	0	1	0	0	0	2	0	0	0	0	0
	Total number days concentration exceeds 2000 ppm											
R4.3a	0	0	0	0	0	0	0	0	0	0	0	0
R4.3b					0	0						
R4.3c					0	0						
R4.7	0	0	0	0	0	0	0	0	0	0	0	0
R5	0	0	0	0	0	0	0	0	0	0	0	0
R6.3	0	0	0	0	0	0	0	0	0	0	0	0
R6.7	0	0	0	0	0	0	0	0	0	0	0	0
R7.3	0	0	0	0	0	0	0	0	0	0	0	0
R7.7	0	0	0	0	0	0	0	0	0	0	0	0
R8.3	0	0	0	0	0	0	0	0	0	0	0	0
R8.7	0	0	0	0	0	0	0	0	0	0	0	0
R9	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum consecutive days concentration exceeds 2000 ppm											
R4.3a	0	0	0	0	0	0	0	0	0	0	0	0
R4.3b					0	0						
R4.3c					0	0						
R4.7	0	0	0	0	0	0	0	0	0	0	0	0
R5	0	0	0	0	0	0	0	0	0	0	0	0
R6.3	0	0	0	0	0	0	0	0	0	0	0	0
R6.7	0	0	0	0	0	0	0	0	0	0	0	0
R7.3	0	0	0	0	0	0	0	0	0	0	0	0
R7.7	0	0	0	0	0	0	0	0	0	0	0	0
R8.3	0	0	0	0	0	0	0	0	0	0	0	0
R8.7	0	0	0	0	0	0	0	0	0	0	0	0
R9	0	0	0	0	0	0	0	0	0	0	0	0

Appendix T

A BOTANICAL REPORT FOR SIX AREAS DESIGNATED FOR POSSIBLE ALTERATION OR DISTURBANCE IN SELECTING A RECEIVER SITE FOR SEDIMENT FROM BEHIND THE SAN CLEMENTE DAM

VERN YADON
1119 Buena Vista Avenue
Pacific Grove, California 93950

A Botanical Report for Six Areas Designated for Possible Alteration or Disturbance in Selecting a Receiver Site for Sediment from Behind the San Clemente Dam

By

Vern Yadon

July 21, 2005

(Field work: May 25, 30 & June 10, July 21, 2005)

As part of the California American Water Company's Seismic Safety Project for San Clemente Dam, botanical data has been gathered by the writer and others while methods and routes are being studied for determining a receiver site and a route of transport for sediment from behind San Clemente Dam. This report is designed to provide botanical data for six areas some of which may have been previously studied. The areas may be variously impacted depending on the proposed use, i.e. transport or receipt of the sediment. Personnel of ENTRIX, Inc. will determine methods to be used, areas to be transversed, and the location(s) of the receiver site(s).

Prepared for:

Mr. Jeremy Pratt
ENTRIX, Inc.
2701 First Avenue Suite 500
Seattle, WA 98121

I. Introduction

I was contacted by Mr. Jeremy Pratt of ENTRIX, Inc., Seattle, Washington, to perform certain botanical surveys based on marked aerial photographs and Geodetic Survey Maps. Ms. Gretchen Lebednik was the principal person to oversee the work to be done. She provided a target list of species to be watched for and indicated the style of report she wished to receive. While the work was scheduled for earlier in May, certain delays prevented the marked overlays from arriving. Rainfall for the entire winter made the unimproved access roads inadvisable at best and impassible for part of the period. Mr. Don Lingenfelter, Dam Keeper for Cal Am, provide access keys and advice on road conditions.

II. Regional Setting

The area studied is within the Carmel Valley quadrangle and essentially lies south and east of San Clemente Dam. The terrain generally slopes westerly and northwesterly from Tularcitos Ridge and Cachagua Rd. to the Carmel River. Carmel Valley Village is to the northwest. The elevations encountered are from approximately 1400 feet at the Cachagua Rd. entry to approximately 540 feet at the San Clemente Dam.

Following Robert Holland's Natural Communities of California, the area vegetation generally is composed of five types. These are: Interior Grasslands, Coast Live Oak Woodland, Coast Live Oak Savanna, Adenostoma Chaparral and River Riparian Forest similar to Holland's Central Coast Cottonwood-Sycamore Riparian Forest.

In attempting to follow Sawyer and Keeler-Wolf *A Manual of California Vegettion* California Native Plant Soc. 1995 and California Natural Diversity Database *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database* May 2002 Edition, some comprimises must be made. The grasslands are most like the Nodding Needlegrass Series. But the present grasslands are mostly dominated by introduced annuals with occasional lenses of more concentrated perennials. The Coast Live Oak forested areas follow the Coast Live Oak Series. The Adenostoma chaparral is within the Chamise Series. No logical vegetation type appears to cover the mixture of plants occuring in the alluvial fans above the San Clemente Dam. However sycamore trees are present as a species, but no forest of that taxon is present. The mixed chaparral of the diversion canal site falls within the Chamise Series.

III. Local Vegetation

The method used in determining the local vegetation was to walk the areas designated while recording the various plant species present. This included the possible transport route along an existing access road from Cachagua Rd. to and including the 4R sediment disposal site. Also transversed was the route of a proposed road leading from the disposal site downward to the Carmel River. The areas above San Clemente Dam were also walked. These included a proposed sediment transport route between San Clemente Creek and the Carmel River, the area of a diversion dyke on the Carmel River, and the proposed diversion canal between San Clemente Creek and the Carmel River. As one might expect, the existing road route from Cachagua Rd. produced the greatest variety of vegetation because it transversed many of the habitats. The ungrazed grassland areas

were greatly overgrown by a dense thatch of introduced grasses influenced by this year's continual series of rainstorms that provided moisture the entire winter. This made growing conditions difficult for the smaller forbs, causing them to be shaded out and nearly impossible to find. The Adenostoma Chaparral was also greatly overgrown so that smaller forbs were shaded out. A seed bank of numerous species will be present within the soils of that habitat element. These species will appear following any future wildland fire. The proposed road extension produced a repeat of plants already found. Additions to the species list began to appear when the area of the dam reservoir was reached. The river area added considerably to the species list as did the east-facing slope of the area proposed for a diversion canal.

Coast Live Oak Forest (Coast Live Oak Series) is the principal upland habitat present. Site 4R is a steep canyon with a closed canopy of Coast Live Oak Forest plus a few additional tree species and tree sized shrubs such as toyon. The disposal site understory is mostly a dense tangle of poison oak, snowberry and shade tolerant ferns and shrubs reaching for light. The canyon is dry except for a bit of moisture flowing along its lower level near the dam reservoir. One might have expected surface water here and there in the canyon because of the abundant winter rains, but drainage flow had mostly followed previously cut channels without retaining surface water or feeding springs.

The plant lists show a preponderance of native species some of which were recorded as single plants. The entire area in actuality has a general intrusion of weedy grasses and introduced forbs numbering fewer in numbers of species but very large in numbers of individuals.

IV. & V. Rare and Endangered Plants or Communities

No rare or endangered plant species were found.

VI. Special Plants

Lewis's Clarkia *Clarkia lewisii* was found along the entry road from the Cachagua Grade. It is a California Native Plant Society List 4 species. A plant appearing on List 4 is not an indication of rarity but rather a request for information concerning its abundance and distribution. Lewis's Clarkia is common on road banks in Monterey County especially in the Santa Lucia Mountains. Eventually the Native Plant Society will determine the scarcity-abundance of this species, but is currently only requesting information on its distribution. The California Department of Fish and Game's publication called Special Plants lists the species in its publication by that name. The publication is dated 2002.

VII. Impact Assessment

To be determined in the EIR process.

VIII Mitigations

To be determined in the EIR process.

IX. Plants of the Various Sites

Plants along Route: Cachagua Road Gate to Site R4 and Vicinity

Habitats: Quercus agrifolia forest; Coast Live Oak Series); Quercus agrifolia-mixed grassland, (Nodding Needlegrass Series); Adenostoma fasciculatum chaparral, (Chamese Series); Closed canopy Quercus agrifolia-mixed hardwood with Toxicodendron diversifolium understory

Acer macrophyllum Big Leaf Maple	Aceraceae	n
Achillea millefolium White Yarrow	Asteraceae	n
Adenostoma fasciculatum Chamise	Rosaceae	n
Adiantum jordanii California Maiden-hair Fern	Pteridaceae	n
Aesculus californica Buckeye	Hippocastanaceae	n
Agoseris grandiflora Large-flowered Agoseris	Asteraceae	n
Agoseris retrorsa Spear-leaved Agoseris	Asteraceae	n
Agrostis pallens (Agrostis diegoensis)	Poaceae	n
Aira caryophyllea Hair Grass	Poaceae	x
Anagallis arvensis Pimpernel, Poor Man's Weather-glass	Primulaceae	x
Arabis glabra var. furcatipilis Tower Mustard	Brassicaceae	n
Arbutus menziesii Madroño	Ericaceae	n
Artemisia californica California Sagebrush	Asteraceae	n
Artemisia douglasiana California Mugwort	Asteraceae	n
Aster radulinus Broad-leaf Aster	Asteraceae	n
Avena barbata Slinder Oat	Poaceae	x
Avena fatua Wild Oat	Poaceae	x
Baccharis pilularis Dwarf Chaparral Broom	Asteraceae	n
Baccharis salicifolia Mule Fat	Asteraceae	n
Bloomeria crocea Common Goldenstar	Liliaceae	n
Bowlesia incana Bowlesia	Apiaceae	n
Briza maxima Rattlesnake Grass	Poaceae	x
Briza minor Little Quaking Grass	Poaceae	x
Bromus carinatus var. carinatus California Brome	Poaceae	n
Bromus diandrus Great Brome	Poaceae	x
Bromus hordeaceus ssp. hordeaceus Soft Chess	Poaceae	x
Bromus pseudolaevipes	Poaceae	n
Bromus rubens Red Brome	Poaceae	x
Bromus vulgaris	Poaceae	n
Calandrinia ciliata Red Maids	Portulaceae	n
Calochortus albus White Globe Lily.	Liliaceae	n
Calystegia malacophylla ssp. pedicellata Wooly Morning-glory	Convolvulaceae	n
Calystegia purpurata var. purpurata Western Morning-glory	Convolvulaceae	n
Calystegia subacaulis Hill Morning-glory	Convolvulaceae	n
Carduus pycnocephalus Italian Thistle	Asteraceae	x
Carex globosa Round-fruited Sedge	Cyperaceae	n
Castilleja attenuata Narrow-leaved Orthocarpus	Scrophulariaceae	n

Ceanothus oliganthus var. sorediatus Jim Brush	Rhamnaceae	n
Centaurea melitensis Tocalote, Yellow Star Thistle	Asteraceae	x
Centaurium davyi Canchalagua	Gentianaceae	n
Cerastium glomeratum Mouse-eared Chickweed	Caryophyllaceae	x
Chamomilla suaveolens Pineapple Weed	Asteraceae	x
Chlorogalum pomeridianum var. pomeridianum Soaproot, Amole	Liliaceae	n
Chorizanthe douglasii Douglas' Spine Flower	Polygonaceae	n
Cirsium occidentalis var. venustum Venus Thistle	Asteraceae	n
Clarkia lewisii Lewis's Clarkia	Onagraceae	n
Clarkia purpurea ssp. quadrivulnera Four Spot	Onagraceae	n
Clarkia unguiculata Canyon Clarkia	Onagraceae	n
Claytonia perfoliata ssp. perfoliata Miner's Lettuce	Portulacaceae	n
Collinsia heterophylla Chinese Houses	Scrophulariaceae	n
Corethrogyne filaginifolia var. filaginifolia	Asteraceae	n
Chorizntheh douglasii Douglas' Spine Flower	Polygonaceae	n
Crassula tillaea Sand Pygmy	Crassulaceae	x
Cynosurus echinatus Dogtail Grass	Poaceae	x
Daucus pusillus Rattlesnake Weed	Apiaceae	n
Dichelostemma capitatum Blue Dicks	Liliaceae	n
Dodecatheon clevelandii ssp. insulare Padre's Shooting Star	Primulaceae	n
Dryopteris arguta California Wood Fern	Dryopteridaceae	n
Elymus glaucus var. glaucus Western Ryegrass	Poaceae	n
Epilobium brachycarpum Summer Cottonweed	Onagraceae	n
Epilobium canum ssp. canum Zauschneria	Onagraceae	n
Epipactis helleborine Hellebore	Orchidaceae	x
Erechtites glomerata Cut-leaved Fireweed	Asteraceae	x
Eremocarpus setigerus Turkey Mullein	Eulphoribaceae	n
Eriogonum nudum var. auriculatum	Polygonaceae	n
Erodium botrys Long-beaked Filaree	Geraniaceae	x
Erodium circutarium Red-stemmed Filaree	Geraniaceae	x
Festuca elmeri Elmer's Fescue	Poaceae	n
Filago gallica Narrow-leaved Filago	Asteraceae	x
Foeniculum vulgare Sweet Fennel	Apiaceae	x
Fragaria vesca California Strawberry	Rosaceae	n
Galium aparine Goose Grass	Rubiaceae	n
Galium californicum ssp. californicum California Bedstraw	Rubiaceae	n
Galium parisiense Wall Bedstraw	Rubiaceae	x
Galium porrigens var. tenue	Rubiaceae	n
Gastridium ventricosum Nitgrass	Poaceae	x
Geranium dissectum Cut-leaved Geranium	Geraniaceae	x
Geranium molle	Geraniaceae	x
Gnaphalium californicum California Everlasting	Asteraceae	n
Gnaphalium luteo-album Weedy Cudweed	Asteraceae	x
Gnaphalium purpureum Purple Cudweed	Asteraceae	n
Gnaphalium ramosissimum Pearly Everlasting	Asteraceae	n
Helianthemum scoparium Rush-rose	Cistaceae	n

Hemizonia corymbosa Tar Weed	Asteraceae	n
Hesperocnide tenella	Urticaceae	n
Heteromeles arbutifolia Toyon	Rosaceae	n
Holodiscus discolor Cream Bush	Rosaceae	n
Hordeum marinum ssp. gussoneanum Mediterranean Barley	Poaceae	x
Hordeum murinum ssp. leporinum Barnyard Foxtail	Poaceae	x
Hypochaeris glabra Smooth Cat's Ear	Asteraceae	x
Juncus bufonius var. bufonius Toad Rush	Juncaceae	n
Juncus patens	Juncaceae	n
Lactuca serriola Prickly Lettuce	Asteraceae	x
Lagophylla ramosissima ssp. ramosissima Common Hareleaf	Asteraceae	n
Lathyrus vestitus var. ochropetalus Bolander Pea	Fabaceae	n
Lathyrus vestitus var. vestitus Pacific Pea	Fabaceae	n
Lepidium nitidum var. nitidum Shining Peppergrass	Brassicaceae	n
Leymus condensatus Giant Wild Rye	Poaceae	n
Leymus triticoides	Poaceae	n
Lithophragma heterophyllum Hill Star	Saxifragaceae	n
Lolium multiflorum Italian Ryegrass	Poaceae	x
Lonicera hispidula var. vacillans Hairy Honeysuckle	Caprifoliaceae	n
Lotus micranthus Small-flowered Lotus	Fabaceae	n
Lotus purshianus Spanish Clover	Fabaceae	n
Lotus scoparius var. scoparius Deer Weed	Fabaceae	n
Lupinus albifrons var. albifrons Silver Lupine	Fabaceae	n
Lupinus bicolor Lindley's Annual Lupine	Fabaceae	n
Lupinus latifolius var. latifolius Broad-leaved Lupine	Fabaceae	n
Madia sativa Coast Tarweed	Asteraceae	n
Marah fabaceus Common Manroot	Cucurbitaceae	n
Medicago polymorpha Calif. Bur-clover	Fabaceae	x
Melica imperfecta Melic	Poaceae	n
Melica torreyana Torrey's Melic	Poaceae	n
Melilotus indica Indian Melilot	Fabaceae	x
Mimulus aurantiacus Sticky Monkey-flower	Scrophulariaceae	n
Mimulus guttatus Monkey Flower	Scrophulariaceae	n
Nassella cernua Nodding Needlegrass	Poaceae	n
Nassella lepida Foothill Needlegrass	Poaceae	n
Nassella pulchra Purple Needlegrass	Poaceae	n
Navarretia atractyloides Holly-leaved Navarretia	Polemoniaceae	n
Nemophila heterophylla Variable-leaved Nemophila	Hydrophyllaceae	n
Nemophila menziesii var. menziesii Baby Blue-eyes	Hydrophyllaceae	n
Oemleria cerasiformis Oso Berry	Rosaceae	n
Osmorhiza chilensis Wood Cicely	Apiaceae	n
Oxalis albicans ssp. pilosa Hairy Wood-sorrel	Oxalidaceae	n
Oxalis pes-caprae Bermuda Buttercup	Oxalidaceae	x
Pellaea andromedifolia Coffee Fern	Pteridaceae	x
Pentagramma triangularis Goldback Fern	Pteridaceae	n

Phacelia imbricata ssp. imbricata Imbricate Phacelia	Hydrophyllaceae	n
Phalaris aquatica Harding Grass	Poaceae	x
Pholistoma auritum Fiesta-flower	Hydrophyllaceae	n
Piperia transversa Transverse Rein-orchid	Orchidaceae	n
Plagiobothrys canescens Valley Popcorn Flower	Boraginaceae	n
Plagiobothrys nothofulvus Popcorn Flower	Boraginaceae	n
Plantago lanceolata Ribwort	Plantaginaceae	x
Plectritis ciliosa ssp. cilosa Long-spurred Plectritis	Valeriaaceae	n
Poa annua Annual Bluegrass	Poaceae	x
Poa secunda ssp. secunda Pine Bluegrass	Poaceae	n
Polygonum arenastrum Knotweed	Polygonaceae	x
Polypodium calirhiza	Polypodiaceae	n
Polypogon monspeliensis Rabbitfoot Grass	Poaceae	x
Populus balsamifera ssp.trichocarpa Black Cottonwood	Salicaceae	n
Potentilla glandulsoa ssp. glandulosa Sticky Cinqufoil	Rosaceae	n
Psilocarphus tenellus var. tenellus Slender Woolly-heads	Asteraceae	n
Pterostegia drymarioides Pterostegia	Polygonaceae	n
Quercus agrifolia var. agrifolia Coast Live Oak	Fagaceae	n
Quercus douglasii Blue Oak	Fagaceae	n
Rafinesquia californica California Chicory	Asteraceae	n
Ranunculus californicus California Buttercup	Ranunculaceae	n
Ranunculus hebecarpus Downy Buttercup	Ranunculaceae	n
Rhamnus californica ssp. californica Coffeeberry	Rhamnaceae	n
Rhamnus crocea Redberry	Rhamnaceae	n
Ribes californicum var. californicum Hillside Gooseberry	Grossulariaceae	n
Ribes divaricatum var. pubiflorum Straggly Gooseberry	Grossulariaceae	n
Ribes speciosum Fuchsia-flowered Gooseberry	Grossulariaceae	n
Rosa californica California Wild Rose	Rosaceae	n
Rubus parviflorus Thimble Berry	Rosaceae	n
Rubus ursinus California Blackberry	Rosaceae	n
Rumex acetosella Sheep Sorrel	Polygonaceae	x
Rumex crispus Curly Dock	Polygonaceae	x
Rumex pulcher Fiddle Dock	Polygonaceae	x
Rupertia.physodes California Tea	Fabaceae	n
Salix lasiolepis Arroyo Willow	Salicaceae	n
Sambucus mexicana Blue Elderberry	Caprifoliaceae	n
Sanicula bipinnatifida Purple Sanicle	Apiaceae	n
Sanicula crassicaulis Gambleweed	Apiaceae	n
Satureja douglasii Yerba Buena	Lamiaceae	n
Scrophularia californica ssp. floribunda Many-flowered Scroph.	Scrophulariaceae	n
Scrophularia californica ssp. californica California Figwort	Scrophulariaceae	n
Silene antirrhina Sticky Catchfly	Caryophyllaceae	n
Silene gallica Common Catchfly	Caryophyllaceae	x
Silene lemmonii Lemmon's Campion	Caryophyllaceae	n
Silybum marianum Milk Thistle	Asteraceae	x
Sisymbrium officinale Hedge Mustard	Brassicaceae	x

Sisyrinchium bellum Blue-eyed Grass	Iridaceae	n
Smilacina stellata Slim Solomon	Liliaceae	n
Soliva sessilis Common Soliva	Asteraceae	x
Sonchus asper Prickly Sow-thistle	Asteraceae	x
Sonchus oleraceus Common Sow-thistle	Asteraceae	x
Spergula arvensis ssp. arvensis Corn Spurrey	Caryophyllaceae	x
Spergularia rubra Purple Sand Spurrey	Caryophyllaceae	x
Stachys bullata Hedge Nettle	Lamiaceae	n
Stellaria media Common Chickweed	Caryophyllaceae	x
Stephanomeria virgata ssp. pleurocarpa	Asteraceae	n
Symphoricarpos albus var. laevigatus Common Snowberry	Caprifoliaceae	n
Symphoricarpos mollis Creeping Snowberry	Caprifoliaceae	n
Thalictrum fendleri var. polycarpumMeadow Rue	Ranunculaceae	n
Torilis nodosa Knotted Hedge-parsley	Apiaceae	x
Toxicodendron diversilobum Poison-Oak	Anacardiaceae	n
Trichostema lanceolatum Vinegar Weed	Lamiaceae	n
Trifolium barbigerum var. barbigerum Colony Clover	Fabaceae	n
Trifolium bifidum var. bifidum Pinole Clover	Fabaceae	n
Trifolium ciliolatum Tree Clover	Fabaceae	n
Trifolium gracilentum var. gracilentum Pin-point Clover	Fabaceae	n
Trifolium hirtum Rose Clover	Fabaceae	x
Trifolium microcephalum Maiden Clover	Fabaceae	n
Trifolium microdon Valparaiso clover	Fabaceae	n
Trifolium willdenovii Tomcat Clover	Fabaceae	n
Triphysaria pusilla Dwarf Orthocarpus	Scrophulariaceae	n
Triteleia ixioides ssp. ixioides Golden Stars, Golden Brodiaea	Liliaceae	n
Umbellularia californica California Bay	Lauraceae	n
Uropappus lindleyi Silver Puffs	Asteraceae	n
Verbena lasiostachys var. lasiostachys Western Vervain	Verbenaceae	n
Veronica persica Persian Speedwell	Scrophulasriaceae	x
Vicia sativa ssp. sativa Spring Vetch	Fabaceae	x
Viola pedunculata Johnny Jump-up	Violaceae	n
Vulpia bromoides Six-week Fescue	Poaceae	x
Vulpia myuros var. hirsuta Rat-tail Fescue	Poaceae	x
Vulpia myuros var. myuros Rat-tail Fescue	Poaceae	x
Wyethia helenioides Woolly Mule-ears	Asteraceae	n
Yabea microcarpa Western Hedge-parsley	Apiaceae	n
Zigadenus fremontii Star-lily	Liliaceae	n

Plants Deliniated Area Site R4

Habitats: Quercus agrifolia forest (Coast Live Oak Series); Quercus agrifolia-mixed grassland, (Nodding Needlegrass Series); Adenostoma fasciculatum chaparral, (Chamise Series); Closed canopy Quercus agrifolia-mixed hardwood with Toxicodendron diverfsilobum understory

Acer macrophyllum Big Leaf Maple	Aceraceae	n

Achillea millefolium White Yarrow	Asteraceae	n
Adenostoma fasciculatum Chamise	Rosaceae	n
Adiantum jordanii California Maiden-hair Fern	Pteridaceae	n
Aesculus californica Buckeye	Hippocastanaceae	n
Agoseris grandiflora Large-flowered Agoseris	Asteraceae	n
Agoseris retrorsa Spear-leaved Agoseris	Asteraceae	n
Agrostis pallens (Agrostis diegoensis)	Poaceae	n
Aira caryophyllea Hair Grass	Poaceae	x
Anagallis arvensis Pimpernel, Poor Man's Weather-glass	Primulaceae	x
Arabis glabra var. furcatipilis Tower Mustard	Brassicaceae	n
Arbutus menziesii Madroño	Ericaceae	n
Arctostaphylos glandulosa ssp. glandulosa	Ericaceae	n
Artemisia californica California Sagebrush	Asteraceae	n
Artemisia douglasiana California Mugwort	Asteraceae	n
Aster radulinus Broad-leaf Aster	Asteraceae	n
Avena barbata Slinder Oat	Poaceae	x
Aven fatua Wild Oat	Poaceae	x
Baccharis pilularis Dwarf Chaparral Broom	Asteraceae	n
Bowlesia incana Bowlesia	Apiaceae	n
Briza minor Little Quaking Grass	Poaceae	x
Bromus carinatus var. carinatus California Brome	Poaceae	n
Bromus diandrus Great Brome	Poaceae	x
Bromus hordeaceus ssp. hordeaceus Soft Chess	Poaceae	x
Bromus pseudolaevipes	Poaceae	n
Bromus rubens Red Brome	Poaceae	x
Bromus vulgaris	P:oaceae	n
Calochortus albus White Globe Lily.	Liliaceae	n
Carduus pycnocephalus Italian Thistle	Asteraceae	x
Carex globosa Round-fruited Sedge	Cyperaceae	n
Cerastium glomeratum Mouse-eared Chickweed	Caryophyllaceae	x
Chenopodium californicum Soap Plant	Chenopodiaceae	n
Cirsium occidentalis var. venustum Venus Thistle	Asteraceae	n
Clematis ligusticifolia Yerba de Chivato	Ranunculaceae	n
Clarkia lewisii (Clarkia bottae)	Onagraceae	n
Clarkia purpurea ssp. quadrivulnera Four Spot	Onagraceae	n
Claytonia perfoliata ssp. perfoliata Miner's Lettuce	Portulacaceae	n
Cryptantha microstachys	Boraginaceae	n
Cynosurus echinatus Dogtail Grass	Poaceae	x
Dichelostemma capitatum Blue Dicks	Liliaceae	n
Dryopteris arguta California Wood Fern	Dryopteridaceae	n
Elymus glaucus var. glaucus Western Ryegrass	Poaceae	n
Epipactis helleborine Hellebore	Orchidaceae	x
Erechtites minima Toothed Coast Fireweed	Asteraceae	x
Erodium botrys Long-beaked Filaree	Geraniaceae	x
Festuca elmeri Elmer’s Fescue	Poaceae	n
Galium aparine Goose Grass	Rubiaceae	n

Galium californicum ssp. californicum California Bedstraw	Rubiaceae	n
Galium parisiense Wall Bedstraw	Rubiaceae	x
Galium porrigens var. tenue	Rubiaceae	n
Gastridium ventricosum Nitgrass	Poaceae	x
Geranium dissectum Cut-leaved Geranium	Geraniaceae	x
Geranium molle	Geraniaceae	x
Gnaphalium californicum California Everlasting	Asteraceae	n
Gnaphalium luteo-album Weedy Cudweed	Asteraceae	x
Gnaphalium purpureum Purple Cudweed	Asteraceae	n
Gnaphalium ramosissimum Pearly Everlasting	Asteraceae	n
Heteromeles arbutifolia Toyon	Rosaceae	n
Holodiscus discolor Cream Bush	Rosaceae	n
Hordeum murinum ssp. leporinum Barnyard Foxtail	Poaceae	x
Hypochaeris glabra Smooth Cat's Ear	Asteraceae	x
Juncus patens	Juncaceae	n
Lactuca serriola Prickly Lettuce	Asteraceae	x
Lathyrus vestitus var. ochropetalus Bolander Pea	Fabaceae	n
Lathyrus vestitus var. vestitus	Fabaceae	n
Leymus condensatus Giant Wild Rye	Poaceae	n
Lithophragma heterophyllum Hill Star	Saxifragaceae	n
Lolium multiflorum Italian Ryegrass	Poaceae	x
Lonicera hispidula var. vacillans Hairy Honeysuckle	Caprifoliaceae	n
Lotus scoparius var. scoparius Deer Weed	Fabaceae	n
Madia sativa Coast Tarweed	Asteraceae	n
Marah fabaceus Common Manroot	Cucurbitaceae	n
Medicago polymorpha Calif. Bur-clover	Fabaceae	x
Melica californica California Melic	Poaceae	n
Melica imperfecta Melic	Poaceae	n
Melilotus indica Indian Melilot	Fabaceae	x
Mimulus aurantiacus Sticky Monkey-flower	Scrophulariaceae	n
Monardella villosa ssp. villosa Coyote Mint	Lamiaceae	n
Nassella lepida Hill Needlegrass	Poaceae	n
Oemleria cerasiformis Oso Berry	Rosaceae	n
Osmorhiza chilensis Wood Cicely	Apiaceae	n
Pentagramma triangularis Goldback Fern	Pteridaceae	n
Pholistoma auritum Fiesta-flower	Hydrophyllaceae	n
Poa annua Annual Bluegrass	Poaceae	x
Poa secunda ssp. secunda Pine Bluegrass	Poaceae	n
Polypodium calirhiza	Polypodiaceae	n
Potentilla glandulsoa ssp. glandulosa Sticky Cinqufoil	Rosaceae	n
Pterostegia drymarioides Pterostegia	Polygonaceae	n
Quercus agrifolia var. agrifolia Coast Live Oak	Fagaceae	n
Rafinesquia californica California Chicory	Asteraceae	n
Ranunculus hebecarpus Downy Buttercup	Ranunculaceae	n
Rhamnus californica ssp. californica Coffeeberry	Rhamnaceae	n
Ribes californicum var. californicum Hillside Gooseberry	Grossulariaceae	n

Ribes divaricatum var. pubiflorum Straggly Gooseberry	Grossulariaceae	n
Ribes speciosum Fuchsia-flowered Gooseberry	Grossulariaceae	n
Rosa californica California Wild Rose	Rosaceae	n
Rubus ursinus California Blackberry	Rosaceae	n
Salix lasiolepis Arroyo Willow	Salicaceae	n
Salvia mellifera Black Sage	Lamiaceae	n
Sambucus mexicana Blue Elderberry	Caprifoliaceae	n
Sanicula crassicaulis Gambleweed	Apiaceae	n
Satureja douglasii Yerba Buena	Lamiaceae	n
Scrophularia californica ssp. californica California Figwort	Scrophulariaceae	n
Scrophularia californica ssp. floribunda Many-flowered Scroph.	Scrophulariaceae	n
Silene gallica Common Catchfly	Caryophyllaceae	x
Silybum marianum Milk Thistle	Asteraceae	x
Sisymbrium officinale Hedge Mustard	Brassicaceae	x
Sisyrinchium bellum Blue-eyed Grass	Iridaceae	n
Smilacina stellata Slim Solomon	Liliaceae	n
Solidago californica California Goldenrod	Asteraceae	n
Sonchus asper Prickly Sow-thistle	Asteraceae	x
Sonchus oleraceus Common Sow-thistle	Asteraceae	x
Stachys bullata Hedge Nettle	Lamiaceae	n
Stellaria media Common Chickweed	Caryophyllaceae	x
Symphoricarpos albus var. laevigatus Common Snowberry	Caprifoliaceae	n
Symphoricarpos mollis Creeping Snowberry	Caprifoliaceae	n
Torilis nodosa Knotted Hedge-parsley	Apiaceae	x
Toxicodendron diversilobum Poison-Oak	Anacardiaceae	n
Trifolium ciliolatum Tree Clover	Fabaceae	n
Trifolium microcephalum Maiden Clover	Fabaceae	n
Trifolium willdenovii Tomcat Clover	Fabaceae	n
Triteleia ixioides ssp. ixioides Golden Stars, Golden Brodiaea	Liliaceae	n
Umbellularia californica California Bay	Lauraceae	n
Verbena lasiostachys var. lasiostachys Western Vervain	Verbenaceae	n
Veronica persica Persian Speedwell	Scrophulariaceae	x
Vulpia myuros var. hirsuta Rat-tail Fescue	Poaceae	x
Vulpia myuros var. myuros Rat-tail Fescue	Poaceae	x
Yabea microcarpa Western Hedge-parsley	Apiaceae	n
Zigadenus fremontii Star-lily	Liliaceae	n

Plants Along Proposed New Road to Reservoir

Habitats: Quercus agrifolia forest, (Coast Live Oak Series); Adenostoma fasciculatum chaparral, (Chamise Series); Closed canopy Quercus agrifolia-mixed hardwood with Toxicodendron diverfsilobum understory

Achillea millefolium White Yarrow	Asteraceae	n

Adenostoma fasciculatum Chamise	Rosaceae	n
Adiantum jordanii California Maiden-hair Fern	Pteridaceae	n
Aesculus californica Buckeye	Hippocastanaceae	n
Agoseris retrorsa Spear-leaved Agoseris	Asteraceae	n
Anagallis arvensis Pimpernel, Poor Man's Weather-glass	Primulaceae	x
Arabis glabra var. furcatipilis Tower Mustard	Brassicaceae	n
Arbutus menziesii Madroño	Ericaceae	n
Artemisia californica California Sagebrush	Asteraceae	n
Artemisia douglasiana California Mugwort	Asteraceae	n
Aster radulinus Broad-leaf Aster	Asteraceae	n
Avena barbata Slinder Oat	Poaceae	x
Avena fatua Wild Oat	Poaceae	x
Baccharis douglasii Douglas' Baccharis	Asteraceae	n
Baccharis pilularis Dwarf Chaparral Broom	Asteraceae	n
Bowlesia incana Bowlesia	Apiaceae	n
Bromus diandrus Great Brome	Poaceae	x
Bromus hordeaceus ssp. hordeaceus Soft Chess	Poaceae	x
Bromus rubens Red Brome	Poaceae	x
Calochortus albus White Globe Lily.	Liliaceae	n
Calystegia purpurata var. purpurata Western Morning-glory	Convolvulaceae	n
Carduus pycnocephalus Italian Thistle	Asteraceae	x
Carex globosa Round-fruited Sedge	Cyperaceae	n
Ceanothus cuneatus var. cuneatus Buck Brush	Rhamnaceae	n
Ceanothus oliganthus var. sorediatus Jim Brush	Rhamnaceae	n
Centaurea melitensis Tocalote, Yellow Star Thistle	Asteraceae	x
Cerastium glomeratum Mouse-eared Chickweed	Caryophyllaceae	x
Chlorogalum pomeridianum var. pomeridianum Soaproot, Amole	Liliaceae	n
Cirsium occidentalis var. venustum Venus Thistle	Asteraceae	n
Clarkia purpurea ssp. quadrivulnera Four Spot	Onagraceae	n
Clarkia unguiculata Canyon Clarkia	Onagraceae	n
Claytonia perfoliata ssp. perfoliata Miner's Lettuce	Portulacaceae	n
Cynoglossum grande Hound's Tngue	Boraginaceae	n
Cynosurus echinatus Dogtail Grass	Poaceae	x
Daucus pusillus Rattlesnake Weed	Apiaceae	n
Dichelostemma capitatum Blue Dicks	Liliaceae	n
Dryopteris arguta California Wood Fern	Dryopteridaceae	n
Dudleya lanceolata	Crassulaceae	n
Elymus glaucus var. glaucus Western Ryegrass	Poaceae	n
Epilobium canum ssp. canum Zauschneria	Onagraceae	n
Epipactis helleborine Hellebore	Orchidaceae	x
Equisetum hyemale ssp. affine scouring-rush	Equissetaceae	n
Eremocarpus setigerus Turkey Mullein	Eulphoribaceae	n
Erodium botrys Long-beaked Filaree	Geraniaceae	x
Euphorbia crenulata Chinese Caps	Euphorbiaceae	n
Foeniculum vulgare Sweet Fennel	Apiaceae	x
Galium aparine Goose Grass	Rubiaceae	n

Galium porrigens var. tenue	Rubiaceae	n
Genista monspessulina French Broom	Fabaceae	x
Geranium dissectum Cut-leaved Geranium	Geraniaceae	x
Geranium molle	Geraniaceae	x
Helenium puberulum Sneeze-weed	Asteraceae	n
Heteromeles arbutifolia Toyon	Rosaceae	n
Holodiscus discolor Cream Bush	Rosaceae	n
Hordeum murinum ssp. leporinum Barnyard Foxtail	Poaceae	x
Hypochaeris glabra Smooth Cat's Ear	Asteraceae	x
Juncus patens	Juncaceae	n
Juncus xiphioides	Juncaceae	n
Lathyrus vestitus var. vestitus	Fabaceae	n
Lemna minor Duckweed	Lemnaceae	n
Leymus condensatus Giant Wild Rye	Poaceae	n
Lolium multiflorum Italian Ryegrass	Poaceae	x
Lonicera hispidula var. vacillans Hairy Honeysuckle	Caprifoliaceae	n
Madia sativa Coast Tarweed	Asteraceae	n
Marah fabaceus Common Manroot	Cucurbitaceae	n
Medicago polymorpha Calif. Bur-clover	Fabaceae	x
Melica imperfecta Melic	Poaceae	n
Mimulus aurantiacus Sticky Monkey-flower	Scrophulariaceae	n
Mimulus guttatus Monkey Flower	Scrophulariaceae	n
Osmorhiza chilensis Wood Cicely	Apiaceae	n
Pellaea andromedifolia Coffee Fern	Pteridaceae	x
Pentagramma triangularis Goldback Fern	Pteridaceae	n
Phacelia imbricata ssp. imbricata Imbricate Phacelia	Hydrophyllaceae	n
Pholistoma auritum Fiesta-flower	Hydrophyllaceae	n
Plantago lanceolata Ribwort	Plantaginaceae	x
Poa annua Annual Bluegrass	Poaceae	x
Polygonum arenastrum Knotweed	Polygonaceae	x
Polypodium calirhiza	Polypodiaceae	n
Populus balsamifera ssp.trichocarpa Black Cottonwood	Salicaceae	n
Potentilla glandulsoa ssp. glandulosa Sticky Cinqufoil	Rosaceae	n
Pterostegia drymarioides Pterostegia	Polygonaceae	n
Quercus agrifolia var. agrifolia Coast Live Oak	Fagaceae	n
Rhamnus californica ssp. californica Coffeeberry	Rhamnaceae	n
Rhamnus ilicifolia Redberry	Rhamnaceae	n
Ribes speciosum Fuchsia-flowered Gooseberry	Grossulariaceae	n
Rosa californica California Wild Rose	Rosaceae	n
Rubus ursinus California Blackberry	Rosaceae	n
Rumex acetosella Sheep Sorrel	Polygonaceae	x
Rumex crispus Curly Dock	Polygonaceae	x
Rumex salicifolius var. salicifolium Willow Dock	Polygonaceae	n
Salix lasiolepis Arroyo Willow	Salicaceae	n
Sambucus mexicana Blue Elderberry	Caprifoliaceae	n
Sanicula crassicaulis Gambleweed	Apiaceae	n

Satureja douglasii Yerba Buena	Lamiaceae	n
Scirpus californica California Tule	Cyperaceae	n
Scirpus microcarpus Panicled Bullrush	Cyperaceae	n
Scrophularia californica ssp. californica California Figwort	Scrophulariaceae	n
Silybum marianum Milk Thistle	Asteraceae	x
Sisymbrium officinale Hedge Mustard	Brassicaceae	x
Sisyrinchium bellum Blue-eyed Grass	Iridaceae	n
Smilacina stellata Slim Solomon	Liliaceae	n
Solidago californica Common Golderod	Asteraceae	n
Sonchus asper Prickly Sow-thistle	Asteraceae	x
Stachys bullata Hedge Nettle	Lamiaceae	n
Symphoricarpos albus var. laevigatus Common Snowberry	Caprifoliaceae	n
Thalictrum fendleri var. polycarpumMeadow Rue	Ranunculaceae	n
Torilis nodosa Knotted Hedge-parsley	Apiaceae	x
Toxicodendron diversilobum Poison-Oak	Anacardiaceae	n
Trifolium bifidum var. bifidum Pinole Clover	Fabaceae	n
Trifolium ciliolatum Tree Clover	Fabaceae	n
Trifolium microcephalum Maiden Clover	Fabaceae	n
Trifolium microdon Valparaiso clover	Fabaceae	n
Triteleia ixioides ssp. ixioides Golden Stars, Golden Brodiaea	Liliaceae	n
Umbellularia californica California Bay	Lauraceae	n
Verbena lasiostachys var. lasiostachys Western Vervain	Verbenaceae	n
Vulpia myuros var. hirsuta Rat-tail Fescue	Poaceae	x
Vulpia myuros var. myuros Rat-tail Fescue	Poaceae	x
Yabea microcarpa Western Hedge-parsley	Apiaceae	n

Potential Sediment Transport Route above San Clemente Dam

Area previously partially cleared, Quercus agrifolia overstory in part, alluvial grassland with some native grasses and sedges. Distal portion solid Conium maculatum and Urtica dioica plus willows

Adenostoma fasciculatum Chamise	Rosaceae	n
Aesculus californica Buckeye	Hippocastanaceae	n
Alnus rubra Red Alder	Betulaceae	n
Anagallis arvensis Pimpernel, Poor Man's Weather-glass	Primulaceae	x
Arbutus menziesii Madroño	Ericaceae	n
Artemisia douglasiana California Mugwort	Asteraceae	n
Avena barbata Slinder Oat	Poaceae	x
Baccharis douglasii Douglas' Baccharis	Asteraceae	n
Baccharis pilularis Dwarf Chaparral Broom	Asteraceae	n
Barbarea orthoceras American Winter-cress	Brassicaceae	n
Bromus carinatus var. carinatus California Brome	Poaceae	n
Bromus diandrus Great Brome	Poaceae	x
Bromus hordeaceus ssp. hordeaceus* Soft Chess	Poaceae	x
Bromus rubens Red Brome	Poaceae	x

Carex barbarae Santa Barbara Sedge	Cyperaceae	n
Carex harfordii Monterey Sedge	Cyperaceae	n
Centaurea melitensis Tocalote, Yellow Star Thistle	Asteraceae	x
Cirsium occidentale var. venustum Venus Thistle	Asteraceae	n
Cirsium vulgare Bull Thistle	Asteraceae	x
Clarkia purpurea ssp. quadrivulnera Four Spot	Onagraceae	n
Clarkia unguiculata Canyon Clarkia	Onagraceae	n
Claytonia perfoliata ssp. perfoliata Miner's Lettuce	Portulacaceae	n
Conium maculatum Poison-hemlock	Apiaceae	x
Conyza bonariensis South American Conyza	Asteraceae	x
Cynosurus echinatus Dogtail Grass	Poaceae	x
Deschampsia danthonioides Annual Hair-grass	Poaceae	n
Digitalis purpurea Foxglove	Scrophulariaceae	x
Dryopteris arguta California Wood Fern	Dryopteridaceae	n
Elymus glaucus var. glaucus Western Ryegrass	Poaceae	n
Galium aparine Goose Grass	Rubiaceae	n
Galium parisiense Wall Bedstraw	Rubiaceae	x
Geranium dissectum Cut-leaved Geranium	Geraniaceae	x
Geranium molle Velvet Geranium	Geranicaceae	x
Helenium puberulum Sneeze-weed	Asteraceae	n
Heteromeles arbutifolia Toyon	Rosaceae	n
Hirschfeldia incana Summer Mustard	Brassicaceae	x
Holcus lanatus Velvet Grass	Poaceae	x
Hordeum distichon Cultivated Barley	Poaceae	x
Hypochaeris glabra Smooth Cat's Ear	Asteraceae	x
Juncus effusus var. brunneus Common Rush	Juncaceae	n
Juncus patens Spreading Rush	Juncaceae	n
Lactuca serriola Prickly Lettuce	Asteraceae	x
Lathyrus vestitus var. vestitus Paciofic Pea	Fabaceae	n
Lolium multiflorum Italian Ryegrass	Poaceae	x
Lonicera hispidula var. vacillans Hairy Honeysuckle	Caprifoliaceae	n
Lotus purshianus Spanish Clover	Fabaceae	n
Lotus scoparius var. scoparius Deer Weed	Fabaceae	n
Lupinus albifrons var. albifrons Silver Lupine	Fabaceae	n
Lupinus bicolor Lindley's Annual Lupine	Fabaceae	n
Lupinus nanus Sky Lupine	Fabaceae	n
Madia sativa Coast Tarweed	Asteraceae	n
Medicago polymorpha Calif. Bur-clover	Fabaceae	x
Melilotus indica Indian Melilot	Fabaceae	x
Mimulus aurantiacus Northern Sticky Monkey-flower	Scrophulariaceae	n
Osmorhiza chilensis Wood Cicely	Apiaceae	n
Polygonum persicaria Spotted Persicaria	Polygonaceae	x
Polypogon monspeliensis Rabbitfoot Grass	Poaceae	x
Quercus agrifolia var. agrifolia Coast Live Oak	Fagaceae	n
Rhamnus californica ssp. californica Coffeeberry	Rhamnaceae	n
Ribes divaricatum var. pubiflorum Straggly gooseberry	Grossulariaceae	n

Ribes speciosum Fuchsia-flowered Gooseberry	Grossulariaceae	n
Rorippa nasturtium-aquaticum Water-cress	Brassicaceae	n
Rubus ursinus California Blackberry	Rosaceae	n
Rumex acetosella Sheep Sorrel	Polygonaceae	x
Rumex crispus Curly Dock	Polygonaceae	x
Salix lasiolepis Arroyo Willow	Salicaceae	n
Sambucus mexicana Blue Elderberry	Caprifoliaceae	n
Satureja douglasii Yerba Buena	Onagraceae	n
Scirpus microcarpus Panicled Bulrush	Cyperaceae	n
Silybum marianum Milk Thistle	Asteraceae	x
Sonchus asper Prickly Sow-thistle	Asteraceae	n
Stachys bullata Hedge Nettle	Lamiaceae	n
Symphoricarpos mollis Creeping Snowberry	Caprifoliaceae	n
Torilis nodosa Knotted Hedge-parsley	Apiaceae	x
Toxicodendron diversilobum Poison-Oak	Anacardiaceae	n
Trifolium microcephalum Maiden Clover	Fabaceae	n
Umbellularia californica California Bay	Lauraceae	n
Urtica dioica ssp. holosericea Hoary Nettle	Urticaceae	n
Verbena lasiostachys var. lasiostachys	Verbeniaceae	n
Vulpia myuros var. myuros	Poaceae	x
Zigadenus fremontii Fremont's Star Lily	Liliaceae	n

Plants of San Clemente Diversion Dike

A combination of alluvium filled river bottom plus closed canopy Quercus Agrifolia and some open grassland

Achillea millefolium White Yarrow	Asteraceae	n
Adenostoma fasciculatum Chamise	Rosaceae	n
Adiantum jordanii California Maiden-hair Fern	Pteridaceae	n
Aesculus californica Buckeye	Hippocastranacee	n
Agoseris retrorsa Spear-leaved Agoseris	Asteraceae	n
Agrostis viridis Water Bent-grass	Poaceae	x
Aira caryophyllea Hair Grass	Poaceae	x
Alnus rubra Red Alder	Betulaceae	n
Anagallis arvensis Pimpernel, Poor Man's Weather-glass	Primulaceae	x
Arbutus menziesii Madroño	Ericaceae	n
Arctostaphylos glandulosa ssp. glandulosa	Ericaceae	n
Arctostaphylos t. ssp. tomentosa Shaggy-barked Manzanita	Ericaceae	n
Artemisia californica California Sagebrush	Asteraceae	n
Artemisia douglasiana California Mugwort	Asteraceae	n
Artemisia dracunculus Dragon Sagewort	Asteraceae	n
Aster chilensis Common California Aster	Asteraceae	n
Avena barbata Slinder Oat	Poaceae	x
Baccharis pilularis Dwarf Chaparral Broom	Asteraceae	n

Baccharis salicifolia Mule Fat	Asteraceae	n
Brickellia californica California Brickelbush	Asteraceae	n
Bromus carinatus var. carinatus California Brome	Poaceae	n
Bromus diandrus Great Brome	Poaceae	x
Bromus hordeaceus ssp. hordeaceus Soft Chess	Poaceae	x
Bromus madritensis ssp. madritensis Madrid Brome	Poaceae	x
Bromus rubens Red Brome	Poaceae	x
Bromus vulgaris Narrow-flowered Brome	Poaceae	n
Calochortus albus White Globe Lily	Liliaceae	n
Calystegia purpurata ssp. purpurata Western Morning Glory	Convolvulaceae	n
Camissonia micrantha Small Primrose	Onagraceae	n
Carduus pycnocephalus Italian Thistle	Asteraceae	x
Carex globosa Round-fruited Sedge	Cyperaceae	n
Ceanothus oliganthus var. sorediatus Jim Brush	Rhamnaceae	n
Centaurea melitensis Tocalote, Yellow Star Thistle	Asteraceae	x
Chlorogalum pomeridianum var. pomeridianum Soaproot, Amole	Liliaceae	n
Cirsium occidentale var. venustum Venus Thistle	Asteraceae	n
Clarkia lewisii Lewis' Clarkia	Onagraceae	n
Clarkia purpurea ssp. quadrivulnera Four Spot	Onagraceae	n
Clarkia unguiculata Canyon Clarkia	Onagraceae	n
Claytonia perfoliata ssp. perfoliata Miner's Lettuce	Potulacaceae	n
Corethrogyne filaginifolia var. filaginifolia Beach Aster	Asteraceae	n
Cuscuta spp. Dodder	Cuscutaceae	n
Cynosurus echinatus Dogtail Grass	Poaceae	x
Cyperus eragrostis Umbrella Sedge	Cyperaceae	n
Datisca glomerata Durango Root	Datiscaceae	n
Dichelostemma capitatum Blue Dicks	Liliaceae	n
Dudleya lanceolata Lance-leaved Dudleya	Crassulaceae	n
Eleocharis acicularis var. acicularis Needle Spikerush	Cyperaceae	n
Elymus glaucus var. glaucus Western Ryegrass	Poaceae	n
Epilobium brachycarpum Summer Cottonweed	Onagraceae	n
Epilobium ciliatum ssp. watsonii Coast Cottonweed	Onagraceae	n
Equisetum hyemale ssp. affine Scouring-rush	Equisetaceae	n
Eriogonum elegans ssp. elegans Elegant Buckwheat	Polygonaceae	n
Eriogonum nudum var. auriculatum Naked Buckwheat	Polygonaceae	n
Eschscholzia californica California Poppy	Papaveraceae	n
Filago gallica Narrow-leaved Filago	Asteraceae	x
Galium aparine Goose Grass	Rubiaceae	n
Galium californicum ssp. californicum California Bedstraw	Rubiaceae	n
Galium parisiense Wall Bedstraw	Rubiaceae	x
Galium porrigens .var. tenue Climbing Bedstraw	Rubiaceae	n
Gnaphalium canescens ssp. beneolens Fragrant Everlasting	Asteraceae	n
Gnaphalium palustre Lowland Cudweed	Asteraceae	n
Helenium puberulum Sneeze-weed	Asteraceae	n
Heteromeles arbutifolia Toyon	Rosaceae	n
Heterotheca grandiflora Telegraph Weed	Asteraceae	n

Hirschfeldia incana Summer Mustard	Brassicaceae	x
Hoita macrostachya Leather Root	Fabaceae	n
Holodiscus discolor Cream Bush	Rosaceae	n
Juncus effusus var. brunneus Common Rush	Juncaceae	n
Juncus patens Spreading Rush	Juncaceae	n
Lathyrus vestitus var. vestitus Pacific Pea	Fabaceae	n
Lonicera hispidula var. vacillans Hairy Honeysuckle	Caprifoliaceae	n
Lotus purshianus Spanish Clover	Fabaceae	n
Lotus scoparius var. scoparius Deer Weed	Fabaceae	n
Lupinus albifrons var. albifrons Silver Bush Lupine	Fabaceae	n
Lupinus bicolor Lindley's Annual Lupine	Fabaceae	n
Lupinus nanus Sky Lupine	Fabaceae	n
Madia sativa Coast Tarweed	Asteraceae	n
Medicago sativa Alfalfa	Fabaceae	x
Melilotus albus White Sweet-clover	Fabaceae	x
Melilotus indica Indian Melilot	Fabaceae	x
Mentha pulegium Pennyroyal	Lamiaceae	x
Mimulus aurantiacus Sticky Monkey-flower	Scrophulariaceae	n
Nassella lepida Foothill Needlegrass	Poaceae	n
Navarretia atractyloides Holly-leaved Navarretia	Polemoniaceae	n
Osmorhiza chilensis Wood Cicely	Apiaceae	n
Paspalum distichum Knotgrass	Poaceae	x
Pellaea andromediaefolia Coffee Fern	Pteridaceae	n
Pentagramma triangularis Goldback Fern	Pteridaceae	n
Plantago lanceolata Ribwort	Plantaginaceae	x
Platanus racemosa Western Sycamore	Platanaceae	n
Polygala californica California Milkwort	Polygalaceae	n
Polypodium calirhiza California Polypody	Polypodiaceae	n
Polypogon monspeliensis Rabbitfoot Grass	Poaceae	x
Polystichum munitum Sword Fern	Pteridaceae	n
Populus fremontii Fremont's Cottonwood	Salicaceae	n
Quercus agrifolia var. agrifolia Coast Live Oak	Fagaceae	n
Quercus lobata Valley Oak	Fagaceae	n
Rafinesquia californica California Chicory	Asteraceae	n
Rhamnus crocea Redberry	Rhamnaceae	n
Ribes speciosum Fuchsia-flowered Gooseberry	Grossulariaceae	n
Rumex acetosella Sheep Sorrel	Polygonaceae	x
Rumex crispus Curly Dock	Polygonaceae	x
Rumex salicifolius var. salicifolius Willow Dock	Polygonaceae	n
Rupertia.physodes California Tea	Fabaceae	n
Salix exigua Narrow-leaved Willow	Salicaceae	n
Salix lasiolepis Arroyo Willow	Salicaceae	n
Salix lucida.ssp.lasiandra Shining Willow	Salicaceae	n
Salvia mellifera Black Sage	Lamiaceae	n
Scirpus microcarpus Panicled Bulrush	Cyperaceae	n
Sonchus asper Prickly Sow-thistle	Asteraceae	x

Stachys bullata Hedge Nettle	Lamiaceae	n
Symphoricarpos albus var. laevigatus Common Snowberry	Caprifoliaceae	n
Toxicodendron diversilobum Poison-Oak	Anacardiaceae	n
Trifolium hirtum Rose Clover	Fabaceae	x
Trifolium willdenovii Tomcat Clover	Fabaceae	n
Typha domingensis Narrow-leaved Cat-tail	Typhaceae	n
Umbellularia californica California Bay	Lauraceae	n
Verbascum thapsus Woolly Mullein	Scrophulariaceae	x
Veronica anagallis-aquatica Water Speedwell	Scrophulariaceae	x
Vulpia myuros var. hirsuta	Poaceae	x
Yabea microcarpa Western Hedge-parsley	Apiaceae	n

Entrix Plants of San Clemente Diversion Canal

Habitat is entirely (Chamise Series), Adenostoma Chaparral with a mixture of other shrubs because the east facing portion is quite steep and has had some slides. The west portion is vertical

Achillea millefolium White Yarrow	Asteraceae	n
Adenostoma fasciculatum Chamise	Rosaceae	n
Adiantum jordanii California Maiden-hair Fern	Pteridaceae	n
Agrostis pallens Leafy Bent-grass	Poaceae	n
Aira caryophyllea Hair Grass	Poaceae	x
Alnus rubra Red Alder	Betulaceae	n
Anagallis arvensis Pimpernel, Poor Man's Weather-glass	Primulaceae	x
Anthemus cotula Mayweed	Asteraceae	x
Arctostaphylos glandulosa ssp. glandulosa	Ericaceae	n
Artemisia californica California Sagebrush	Asteraceae	n
Artemisia douglasiana California Mugwort	Asteraceae	n
Aster chilensis Common California Aster	Asteraceae	n
Avena barbata Slinder Oat	Poaceae	x
Baccharis pilularis Dwarf Chaparral Broom	Asteraceae	n
Bromus carinatus var. carinatus California Brome	Poaceae	n
Bromus diandrus Great Brome	Poaceae	x
Bromus hordeaceus ssp. hordeaceus Soft Chess	Poaceae	x
Bromus rubens Red Brome	Poaceae	x
Bromus vulgaris Narrow-flowered Brome	Poaceae	n
Carex globosa Round-fruited Sedge	Cyperaceae	n
Ceanothus oliganthus var. sorediatus Jim Brush	Rhamnaceae	n
Cercocarplus betuloides Mopuntain mahogany	Rosaceae	n
Chenpopodium album White Goosefoot	Chenopodiaceae	x
Cirsium occidentale var. venustum Venus Thistle	Asteraceae	n
Clematis ligusticifolia Yerba de Chivato	Ranunculaceae	n
Conyza bonariensis South American Conyza	Asteraceae	x
Cryptantha micromeres Minute-flowered Cryptantha	Boraginaceae	n
Cynosurus echinatus Dogtail Grass	Poaceae	x
Datisca glomerata Durango Root	Datiscaceae	n

Delphinium parryi Parry's Larkspur	Ranunculaceae	n
Dudleya lanceolata Lance-leaved Dudleya	Crassulaceae	n
Elymus glaucus var. Western Reygrass	Poaceae	n
Epilobium brachycarpum Summer Cottonweed	Onagraceae	n
Eriiophyllum confertiflorum var. confertiflorum Golden Yarrow	Asteraceae	n
Eriogonum fasciculatum var. foliolosum California Buckwheat	Polygonaceae	n
Eriogonum nudum var. auriculatum Naked Buckwheat	Polygonaceae	n
Festuca californica California Fescue	Poaceae	n
Galium parisiense Wall Bedstraw	Rubiaceae	x
Galilum porrigens var. tenue Climbing Bedstraw	Rubiaceae	n
Gnaphalium bicolor Bioletti's Cudweed	Asteraceae	n
Heteromeles arbutifolia Toyon	Rosaceae	n
Hirschfeldia incana Summer Mustard	Brassicaceae	n
Hordeum murinum ssp. leporinum Barnyard Foxtail	Poaceae	n
Hordeum murinum ssp. leporinum Barnyard Foxtail	Poaceae	x
Leymus condensatus Giant Ryegrass	Poaceae	n
Linanthus liniflorus Flax-flowered Linanthus	Polemoniaceae	n
Lolium multiflorum Italian Ryegrass	Poaceae	x
Marah fabaceus Manroot, Wild Cucumber	Cucurbitaceae	n
Melica californica California Melic	Poaceae	n
Melica imperfecta California Melica	Poaceae	n
Melilotus indica Indian Melilot	Fabaceae	n
Mimulus aurantiacus Sticky Monkey-flower	Scrophulariaceae	n
Nassella lepida Foothill Needlegrass	Poaceae	n
Pellaea andromediaefolia Coffee Fern	Pteridaceae	n
Pellaea mucronata Birds-foot Fern	Pteridaceae	x
Pentagramma triangularis Goldback Fern	Pteridaceae	n
Phacelia imbricata Imbricate Phacelia	Hydrophyllaceae	n
Platanus racemosa Western Sycamore	Platanaceae	n
Polypodium calirhiza California Polypody	Polypodiaceae	n
Polypogon monspeliensis Rabbitfoot Grass	Poaceae	x
Populus balsamifera ssp. tricocarpa Black Cottonwood	Salicaceae	n
Prunus ilicifolia Holly-leaf Cherry	Rosaceae	n
Pterostegia drymarioides Pterostegia	Polygonaceae	n
Quercus agrifolia var. agrifolia Coast Live Oak	Fagaceae	n
Rafinesquia californica California Chicory	Asteraceae	n
Rhamnus crocea Redberry	Rhamnaceae	n
Rumex salicifolius var. salicifolius Willow Dock	Polygonaceae	n
Salix lasiolepis Arroyo Willow	Salicaceae	n
Salvia mellifera Black Sage	Lamiaceae	n
Sambucus mexicana Blue Elderberry	Calprifoliaceae	n
Satureja douglasii Yerba Buena	Lamiaceae	n
Scirpus californica California Tule	Cypraceae	n
Selaginella bigelovii Bushy Selaginella	Selaginellaceae	n
Sonchus asper Prickly Sow-thistle	Asteraceae	x
Stachys bullata Hedge Nettle	Lamiaceae	n

Stephanomeria virgata ssp. pleurocarpa Stephanomeria	Asteraceae	n
Toxicodendron diversilobum Poison-Oak	Anacardiaceae	n
Triteleia ixioides ssp. ixioides Golden Brodiaea	Liliaceae	n
Urtica dioica ssp. holosericea Hoary Nettle	Urticaceae	n
Veronica anagallis-aquatica Water Speedwell	Scrophulariaceae	x
Vulpia myuros var. hirsuta	Poaceae	x
Zigadenus fremontii Fremont's Star Lily	Liliaceae	n

Appendix U

BOTANICAL RESOURCES MANAGEMENT PLAN

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APPENDIX U

BOTANICAL RESOURCES MANAGEMENT PLAN

EROSION CONTROL, REVEGETATION, OAK WOODLAND, ANDWETLAND RESTORATION PLAN

1.1 INTRODUCTION

Implementation of activities related to the San Clemente Dam Seismic Retrofit Project (Project) has the potential to affect botanical resources, wetlands, and Other Waters of the U.S (OWUS) within and near the Project Area. A Draft Environmental Impact Report/ Environmental Impact Statement (DEIR/EIS) identified potential issues related to vegetation communities and wetlands, and described mitigation measures to minimize and mitigate potential impacts (CITATION). This Botanical Resources Management Plan (Plan) has been prepared to address these issues. It identifies measures to be taken by the California-American Water Company (CAW) and its contractors (Contractor) for erosion control and to minimize and mitigate for Project-related effects to native oaks and riparian vegetation and wetlands/Other WOUS.

This plan contains the following components.

- Avoidance and minimization measures
- Erosion control measures and best management practices (BMPs)
- Revegetation plan for upland, riparian and wetland communities
- Post-construction monitoring for revegetation
- Wetland/OWUS restoration, mitigation, and monitoring

The Plan identifies best management practices (BMPs) to minimize project-related effects, such as loss of native vegetation and erosion/sedimentation during construction activities. It outlines a revegetation plan to mitigate for loss of native vegetation. It outlines a post-construction monitoring plan for revegetation. It outlines wetland restoration, mitigation, and monitoring. The Plan identifies measures to be taken by CAW and its contractors (Contractor) to ensure that measures contained in this Plan are carried out in accordance with federal, state, and local regulations.

This document shall be finalized with review and comments from agencies and organizations vested in management of oak woodland and riparian resources, the detection and control of invasive species, and wetland management. These agencies include the U.S. Army Corps of Engineers (Corps), U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), State Water Resources Control Board (State Water Board), and Monterey County.

ISSUES ADDRESSED IN THIS PLAN

Issues identified in the San Clemente Dam Seismic Retrofit Project Draft Environmental Impact Report/Environmental Impact Statement that are addressed in this Plan are summarized as follows.

Impacts to Vegetation Resources

This Plan addresses the following Vegetation issues identified in the DEIR/EIS.

Issue VE-2: Loss of Protected Oak Woodland

Construction activities could result in loss of oak woodlands protected by the Monterey County Oak Protection Ordinance (Monterey County Code 2005). Improvements to access routes may also result in oak losses. For the Proponent's Proposed Project, Alternative 1, and Alternative 2, most of the loss of oak woodland would occur at the sediment disposal site and the conveyor route to the site. For Alternative 3, most of the loss would occur at the access route to the construction site. No impact would occur under Alternative 4 (No Project). The estimated acreage of loss of oak woodlands for each of the project alternatives is summarized as follows.

- Proponent's Proposed Project: 1 acre. Construction of Tularcitos access route also would require removal of coast oak trees.
- Alternative 1 (Dam Notching): 19.4 acres
- Alternative 2 (Dam Removal): 26.3 acres in the area mapped in 2005.
- Alternative 3 (Carmel River Reroute and Dam Removal): 9.6 acres

Issue VE-3: Loss of Other Native Vegetation

Project activities are expected to result in loss of native vegetation, including several types of sensitive riparian habitat and oak woodland habitat. No impact would occur under Alternative 4 (No Project). The estimated total acreage of loss native vegetation, including several types of sensitive riparian habitat and oak woodland habitat is as follows:

- Proponent's Proposed Project: 3.4 acres. An unquantified amount of riparian vegetation could also be lost due to de-watering and diversion.
- Alternative 1 (Dam Notching): 48.2 acres.
- Alternative 2 (Dam Removal): 70.3 acres in the area mapped in 2005.
- Alternative 3 (Carmel River Reroute and Dam Removal): 53.3 acres.

Issue VE-4: Indirect Effects on Native Vegetation (effects caused by increased erosion and sedimentation)

Under the Proponent's Proposed Project and Alternatives 1 through 3, Project activities may result in indirect adverse impacts to vegetation, including increased erosion and sedimentation, damage to roots of oaks and other tree species adjacent to areas where heavy equipment would be operated, dust impacts to roadside vegetation, and colonization of exposed substrate by exotic plant species. Under Alternative 4 (No Project), indirect impacts to downstream vegetation may occur. Possible changes to this vegetation would vary by reach and may include increases in bank failure, sediment deposit, and habitat complexity.

Mitigation Requirements

Mitigation for vegetation issues includes measures to avoid or minimize loss of oak woodland and native vegetation, develop and implement best management practices (BMPs) prior to and during construction activities, implement revegetation, and construction and post-construction monitoring.

One component of mitigation for Issue VE-2: loss of protected oak woodland includes a revegetation plan to be completed and implemented immediately following construction with the following elements from the Monterey County Oak Protection Ordinance (Monterey County Code 2005):

- Replace up to half the oak trees removed by access road and right abutment wall construction at a 3:1 ratio by planting seedlings or potted trees in appropriate habitat under the supervision of a qualified botanist;
- Derive all plant material from Carmel Valley area populations;
- Monitor plantings for at least five years after planting;
- Replant seedlings as necessary to replace seedlings that do not survive;
- Take other remedial action as necessary, including irrigation or protection from browsing animals such as deer, to ensure long-term survival of the plantings per the requirements of Title 16, Chapter 16.60, Monterey County Code;
- Provide or acquire a conservation easement sufficient to mitigate at least half the loss of oak trees, per Monterey County Code. The conservation easement shall consist of lands elsewhere in the Carmel River watershed that support undeveloped blue oak stands.

One component of mitigation for Issue VE-3: loss of other native vegetation is to include the following element in the revegetation plan.

- Revegetate riparian forest at a 3:1 ratio for trees removed, including the cottonwood-sycamore riparian forest below San Clemente Dam at the plunge pool staging area

and access road, and any riparian species disturbed at the site of the right abutment wall.

Mitigation for Issue VE-4: indirect effects on native vegetation are addressed by the implementation of various minimization/avoidance measures and (BMPs).

Impacts to Wetlands and Other Waters of the U.S.

This Plan addresses the following Wetland issues identified in the DEIR/EIS. Wetlands Issues WET-1 and WET-3 do not apply to Alternative 4 (No Project).

WET-1: Permanent Loss of Wetlands and Other Waters of the U.S. (permanent loss of jurisdictional waters of the U.S.)

- Proponent's Proposed Project: 0.02 acres of jurisdictional OWUS at the plunge pool.
- Alternative 1 (Dam Notching): 0.12 acre of OWUS at the sediment disposal site.
- Alternative 2 (Dam Removal): 0.12 acre of OWUS at the sediment disposal site.
- Alternative 3 (Carmel River Reroute and Dam Removal): Similar to Proponent's Proposed Project, plus the permanent loss of about 10.0 acres of OWUS at the diversion dam site.

WET-2: Temporary Disturbance of Wetlands and Other Waters of the U.S. (temporary filling of fringe wetlands)

The estimated acreage affected by temporary filling of wetlands for each alternative is as follows.

- Proponent's Proposed Project: 0.13 acre of fringe palustrine emergent wetlands and 7.1 acres of OWUS.
- Alternative 1 (Dam Notching): 0.74 acre of fringe wetlands and up to 8.3 acres of OWUS.
- Alternative 2 (Dam Removal): Similar to Alternative 1, but includes impacts to OWUS in the unnamed tributary at the sediment disposal site and impacts to wetlands and OWUS upstream of the disturbance limits of Alternative 1.
- Alternative 3 (Carmel River Reroute and Dam Removal): 0.3 acre of fringe wetlands and 0.5 acre of OWUS.
- Alternative 4 (No Project): loss of a small area of fringe wetlands and OWUS similar to or less than the area described for the Proponent' Proposed Project.

WET-3: Indirect Impacts to Wetlands and Other Waters of the U.S. (indirect adverse impacts to vegetation, including increased erosion and sedimentation)

- Proponent's Proposed Project: Indirect impacts on wetlands and OWUS.
- Alternative 1 (Dam Notching): Indirect impacts on wetlands and OWUS.
- Alternative 2 (Dam Removal): Similar to Proposed Project but includes impacts to OWUS in the unnamed tributary at the sediment disposal site.
- Alternative 3 (Carmel River Reroute and Dam Removal): Similar to Proponent's Proposed Project

Mitigation Requirements

Mitigation for wetland issues WET-1 and WET-2 includes development and implementation of a restoration, mitigation, and monitoring plan for wetlands and OWUS affected by the project. Implementation of mitigation measures for Impact Issue VE-4 would address Issue WET-3.

Wetland restoration, mitigation and monitoring would be implemented for the Proponent's Proposed Project, Alternatives 1, 2, 3 and 4, and restoration or conservation acreages would be adjusted to suit the affected acreage. Additional measures, such as measures related to installation of cofferdams, would be implemented for some alternatives. Erosion control and sediment management measures would be implemented for construction activities under the Proponent's Proposed Project and all four alternatives.

1.2 PURPOSE

The purpose of this Plan is to

- Avoid or minimize construction impacts, disturbance to protected oak woodlands and native vegetation, such as erosion and sedimentation, and impacts to wetlands and OWUS.
- Mitigate for Project-related loss of oak woodlands and other native vegetation by revegetation with native plant material on Project construction sites and on mitigation sites.
- Mitigate for impacts to wetlands and OWUS.

Specific goals to minimize or avoid direct and indirect construction impacts include the following.

- Minimize disturbance to and loss of native vegetation;
- Minimize damage to roots of oaks and other tree species adjacent to areas where heavy equipment would be operated

- Minimize erosion and sedimentation from construction activities;
- Minimize bank erosion from altered flows;
- Minimize dust impacts to roadside vegetation;
- Minimize alterations of the hydrologic regime that support the riparian forest habitat on the adjacent floodplain;
- Provide irrigation to alders around the reservoir fringe when the reservoir is dewatered and to riparian vegetation above the bypass outflow.

Specific goals to meet the revegetation component of this Plan include the following.

- Replace up to half the oak trees removed by access road and right abutment wall construction at a 3:1 ratio with plant material derived from Carmel Valley area populations;
- Revegetate riparian forest at a 3:1 ratio for trees removed, including the cottonwood-sycamore riparian forest below San Clemente Dam at the plunge pool staging area and access road, and any riparian species disturbed at the site of the right abutment wall;
- Ensure long-term survival of the plantings per the requirements of Title 16, Chapter 16.60, Monterey County Code; and
- Provide or acquire a conservation easement sufficient to mitigate at least half the loss of oak trees, per Monterey County Code.
- Identify and implement baseline mitigation measures for minimizing the extent and duration of project-related disturbance on wetlands and waterbodies.

1.3 RESPONSIBILITIES AND COORDINATION

This Plan shall be implemented by CAW and the Contractor on the project. CAW and the Contractor have the responsibility for providing all necessary guidance on the project site to their respective employees, and for operating under the requirements of this Plan. Prior to construction, CAW shall contact the appropriate authorities to establish communications, obtain permits (as applicable), and/or fulfill other obligations as directed by regulatory agencies.

This Plan shall be consistent with any local or regional plans, policies, regulations protecting any riparian habitat or other sensitive natural community identified by the U.S. Fish and Wildlife Service (USFWS), Corps, State Water Board, or CDFG. It shall be consistent with any local policies or ordinances protecting biological resources, such as Monterey County's tree preservation policy (Monterey County Code 2005). It shall be modified, if needed, to be consistent with a future, adopted Habitat Conservation Plan,

Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Once the Project is permitted, further changes to this Plan may be implemented if an alternative measure:

- Provides equal or better environmental protection;
- is necessary because a portion of this Plan is infeasible or unworkable based on project-specific conditions; or
- is specifically required in writing by a Federal, state, or Monterey County land management agency for the portion of the project on its land or under its jurisdiction.

Components of this Plan related to riparian vegetation are subject to terms and conditions of Project permits issued by the Corps (Clean Water Act [CWA] section 404), CDFG (Lake or Streambed Alteration Agreement), and State Water Board (CWA section 401), and therefore require approval by these agencies. Protected oak revegetation components of this plan are subject to a Use Permit by the Monterey County Planning Commission, and therefore are subject to approval by the Monterey County Planning Commission. The CDFG is the regulatory authority responsible for oversight for the riparian revegetation component of this Plan.

IMPLEMENTATION OF PLAN COMPONENTS

Measures identified in this Plan apply to work within the project area defined as the construction area, access roads, all work and storage areas, and other areas used during construction of the project. Revegetation (upland, riparian and wetland) measures also apply to any mitigation sites that may be identified for revegetation.

Pre-construction and construction BMPs shall be implemented, as applicable, for all alternatives. Monitoring shall be conducted annually during the construction period by a qualified biologist of all revegetated areas and all areas identified as potential problem areas for erosion and sedimentation from access road construction.

The revegetation component of this Plan shall be implemented for the Proponent's Proposed Project and Alternatives 1 through 3. They shall not be implemented for Alternative 4 (No Action).

The revegetation component of the plan shall be implemented immediately following completion of Phase 1 Construction. A monitoring program shall be implemented immediately following planting. Monitoring shall be conducted during years 1, 2, 3, and 5 following planting. For areas in which trees, saplings, poles, wands, or acorns are planted, monitoring shall also be conducted in the year 10 following planting.

SUPERVISION AND INSPECTION

Environmental inspectors (EIS) shall be designated to implement supervision and inspection activities during construction and post-construction activities.

The number and experience of Environmental Inspectors assigned to each construction spread should be appropriate for the size of the construction area and the number/significance of resources affected. At least one Environmental Inspector having knowledge of the wetland and waterbody conditions in the project area is required.

The Environmental Inspector(s) shall be responsible for ensuring compliance with the requirements of this Plan, the environmental conditions of the applicable permits, the mitigation measures required by environmental permits, other environmental permits and approvals, and environmental requirements in landowner easement agreements.

This plan and a copy of the Notice of Intent shall be kept at all of the construction sites (if practical) or at the nearest contractor office or trailer. This plan shall be available to a responsible agency representative upon request.

All personnel involved in the project shall attend an environmental training program that shall include a discussion on general erosion and sediment control requirements, proper clearing and grading methods, and the importance of protecting sensitive vegetation resources on the project. Crews specializing in vegetation management tasks shall be given additional training on proper installation and maintenance of erosion and sediment control measures, and revegetation measures.

Additional Environmental Inspector's responsibilities are outlined in the Stormwater Pollution Prevention Plan (SWPPP).

Environmental Inspection and Modifications

The Environmental Inspector shall verify that the limits of authorized construction work areas and locations of access roads are properly marked before clearing; and verify the location of signs and highly visible flagging marking the boundaries of sensitive resource areas, waterbodies, wetlands, or areas with special requirements along the construction work area.

Throughout construction, the Contractor and the Environmental Inspector shall inspect temporary erosion control structures and temporary/permanent revegetated areas as follows:

- daily in areas of active construction or equipment operation;
- on a weekly basis in areas with no construction or equipment operation; and
- in all areas of the Project site within 24 hours of each 0.5-inch or greater rainfall event, soil and weather conditions permitting.

The Environmental Inspector shall document all inspections in an Environmental Daily Inspection Report. In the event of forecasted impending heavy precipitation, all temporary erosion control devices found needing repair or new installation shall be repaired immediately. During this period, the Contractor shall provide additional personnel, vehicles, and materials to repair erosion control structure damage where noted during the inspection.

Should structures clog, deteriorate, fail, be damaged, or require maintenance, the Contractor shall conduct repairs or replacements within 24 hours after problems have been identified, weather and soil conditions permitting. Additionally, changes to the Plan shall be made reflecting any corrective measures determined necessary during the inspection.

At sites that have been finally stabilized or where runoff is unlikely, inspections shall be conducted at least once every month until the project site is successfully revegetated. Inspections shall take place until construction is completed.

Based upon the results of the inspection, this Plan shall be revised as needed within seven calendar days to address issues identified and measures recommended. Any changes to this Plan shall be implemented before the next anticipated storm event or as soon as practicable following the inspection. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of this Plan and actions taken resulting from observation made during the inspection shall be made and retained as part of the plan for at least 3 years following the date of the inspection.

1.4 PRECONSTRUCTION AND CONSTRUCTION MEASURES AND BMPS

To meet the Plan goals related to avoidance and minimization of construction impacts to native vegetation, wetland and OWUS, the following measures shall be implemented.

PRECONSTRUCTION PLANNING

CAW and Contractor(s) shall do the following before construction,

Construction Work Areas

- Identify all construction work areas (e.g., construction right-of-way, extra work space areas, storage and contractor yards, borrow and disposal areas, access roads, etc.) that would be needed for safe construction.

- CAW shall ensure that appropriate biological surveys have been conducted for botanical resources. Any required biological surveys shall be expanded, as needed in anticipation of the need for activities outside of certificated work areas.

Measures specific to wetlands and OWUS include the following.

- CAW shall file its wetland delineation report with the Corps before construction. This report shall identify:
  - the wetland type of each wetland (to correlate with the National Wetlands inventory [NWI] classification); and
  - the acreages of each wetland type.
- The area of permanent and temporary disturbance that shall occur in each wetland type shall be provided in the permit application.
- Construction areas shall be situated to avoid wetland areas to the maximum extent possible. If a wetland cannot be avoided, construction areas shall be situated in a manner that minimizes disturbance to wetlands.

Agency Coordination

CAW shall coordinate with the appropriate local, state, and federal agencies as outlined in this Plan.

- Obtain written recommendations from the local soil conservation authorities or land management agencies regarding permanent erosion control and revegetation specifications.
- Consult with County-level Natural Resources Conservation Service authorities regarding seed and seedling stock source recommendations and erosion control methods.
- Consult with state and federal land offices for revegetation and erosion control recommendations for land that is owned or managed by those agencies, if any such lands are included in the project or mitigation areas.
- Coordinate with the Corps and CDFG to minimize and mitigate for permanent and temporary impacts to wetlands and OWUS.
- The erosion control measures in this plan are subject to approval by Monterey County Planning and Building Inspection Department.

CONSTRUCTION MEASURES

Avoidance and Minimization Measures

The following measures shall be implemented under the Proponent's Proposed Project and Alternatives 1 through 3.

- Impacts to a stand of blue oak series shall be avoided by confining the "high road" access improvement activity in the vicinity of this stand to the north side of the

existing road. Fencing shall be used to prevent construction activity from encroaching into the blue oak stand on the south side of the road.

- The proposed access road improvements, the batch plant and laydown areas, plunge pool access, and the abutment staging areas shall be designed to minimize loss of native vegetation. Unnecessary clearing of, or disturbance to, native vegetation outside the road right-of-way shall be avoided.

- Populations of CNPS List 4 species, such as virgate eriastrum, shall be avoided to the extent possible.

- Disturbed areas or areas of annual grassland habitat between the left abutment and the existing residence shall be used to the maximum extent available for the left abutment staging area.

- Fencing shall be used to prevent any encroachment of vehicles or project activity into undisturbed native habitat or within the dripline of native trees outside the designated batch plant and laydown site, the plunge pool area and the left and right abutment areas.

- Project outflows shall be designed to diffuse water rather than allow it to flow out in a concentrated stream. Outflows shall be placed so as to minimize bank erosion from altered flows. The temporary outflow below the plunge pool shall be designed to minimize alterations of the hydrologic regime that support the riparian forest habitat on the adjacent floodplain.

- Supplemental irrigation shall be provided to alders around the reservoir fringe when the reservoir is dewatered and to riparian vegetation above the bypass outflow.

The following measures shall be implemented for construction in wetlands and OWUS.

- Wetland boundaries and buffers shall be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete.

- Aboveground facilities shall not be located in any wetland, except where the location of such facilities in wetlands is necessary for completion of the project.

Construction Measures and Best Management Practices

The following measures shall be implemented during construction under the Proponent's Proposed Project and Alternatives 1 through 3.

- Standard erosion and sedimentation control measures (BMPs) shall be implemented for all grading, filling, clearing of vegetation, or excavating that occurs in site preparation. Road widening shall be designed to avoid placing fill above canyon walls.

- With the assistance of a qualified hydrologist, all road widening and improvements shall be designed to avoid or minimize alterations of existing drainage patterns that could lead to increased erosion and sedimentation. Appropriate erosion control technology (BMPs) shall be employed during all phases of access road construction. To the extent consistent with other regulatory conditions, construction work shall be scheduled to occur during the dry season.

- To minimize dust, unpaved access roads shall frequently be watered with raw water using a sprayer truck during periods when trucks and other construction vehicles are using the roads, except during periods when precipitation has dampened the soil enough to inhibit dust.

- Where blasting is conducted near the Carmel River or other sensitive habitats, a blasting mat shall be placed over the rock walls in order to capture and direct flying rock debris to fall onto the existing roadway. In addition, temporary wall structures made of wood and/or steel shall be erected adjacent to the existing access road to contain blasted rock on the road.

- Excavation and operation of construction vehicles off of the road right-of-way shall be prohibited within the dripline of oak and other tree species identified for avoidance.

- Cut slopes, fill areas, denuded areas, and any other areas where existing vegetation cover shall be removed outside the roadway shall be revegetated with an appropriate seed mix or seedlings. The seed mix shall be selected with the assistance of a qualified revegetation specialist with demonstrated experience and expertise in revegetation.

- Monitoring shall be conducted by a qualified hydrologist and revegetation specialist of all revegetated areas and all areas identified as potential problem areas for erosion and sedimentation from access road construction. Remedial action shall be implemented if revegetation is not successful or if significant erosion and sedimentation problems are observed during monitoring.

When the construction activities encounter wetlands, CAW shall protect and minimize potential adverse impacts to wetlands by:

- Expediting construction in and around wetlands, and limiting the amount of equipment and mainline construction activities within wetlands to reduce disturbances of wetland soils;

- Restoring wetlands to their original configurations and contours, except where modification of the area is part of the project objectives;

- Permanently stabilizing upland areas near wetlands as soon as possible after completion of ground disturbing work; and

- Inspecting the project area periodically during and after construction and repairing any erosion control or restoration features until vegetation is successfully established on the upland portions of the project area.

Additional methods and procedures to control erosion and minimize impacts to vegetation are presented in the Storm Water Pollution Prevention Plan (CAW 2007).

Erosion and Sediment Control

GENERAL MEASURES

Temporary erosion and sediment control measures are designed to effectively reduce erosion and the transport of sediment, and to protect sensitive resources during construction. Temporary erosion control measures shall be installed where needed immediately following significant soil disturbance and shall be maintained throughout the course of construction. In general, temporary erosion control measures shall be removed during cleanup activities after permanent erosion control measures have been installed. Permanent erosion control measures are designed to minimize erosion and sedimentation after construction until revegetation efforts have effectively stabilized the construction area.

Standard erosion control methods and BMPs shall be implemented on both the upslope and downslope sides of all construction zones to minimize potential soil erosion. No fill shall be placed on steep canyon slopes directly above the river. Retaining walls shall be used where road widening occurs immediately upslope of the river on steep banks.

Erosion controls shall be adequately sized and appropriately located. BMPs shall be customized to address site-specific conditions encountered on the steep slopes that adjoin the river. Drainage facilities and slope protection methods shall function throughout the construction and revegetation period. Erosion controls that prevent soil or sediment from entering the river shall be monitored for effectiveness, and maintained throughout the construction operations.

Erosion control methods and procedures shall include, as a minimum, the following:

- Use of filter fabrics, berms, hay bales, and other means to control surface runoff and prevent erosion;

- Monitoring erosion control methods for effectiveness and maintenance of these methods throughout the duration of construction operations;

- Constructing fills and spoil areas by selective placement to eliminate surface silts or clays which may erode;

- Controlling surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation by holding the areas of bare soil

exposed at one time to a minimum, and providing temporary control measures such as berms, dikes, and drains; and

- Inspecting cut slopes periodically to detect evidence of possible future slope failures, possible rock raveling which could be hazardous to personnel working in the excavation area below.

Temporary sediment control methods specific to wetlands and OWUS include:

- Installing sediment barriers immediately after initial disturbance of the wetland or adjacent upland,

- Properly maintaining sediment barriers throughout construction and reinstalling them as necessary, and

- Maintaining sediment barriers until they are replaced by permanent erosion controls or until the restoration of adjacent upland areas is complete.

- Installing sediment barriers across the entire construction area immediately upslope of the wetland boundary at all wetland crossings where necessary to prevent sediment flow into the wetland.

- Where wetlands are adjacent to the construction area and the construction area slopes toward the wetland, installing sediment barriers along the edge of the construction area as necessary to prevent sediment flow into the wetland.

- Installing sediment barriers along the edge of the construction area as necessary to contain spoil and sediment within the construction area through wetlands. These sediment barriers shall be removed during post-construction cleanup.

The following general environmental protection measures shall be implemented to minimize environmental impacts during construction and operation of the project:

- All personnel, vehicles, and equipment shall stay in the designated construction areas. Access roads outside of the construction area shall be designated by CAW. All staking, flagging, and exclusion fencing shall be respected.

- Construction, cleanup, and reclamation shall be managed to minimize the time between grading, excavation, backfilling, and final restoration/reclamation.

- Temporary erosion/sediment control devices shall be installed immediately after initial soil disturbance and shall be maintained throughout construction and restoration, as necessary, until replaced by permanent erosion control measures.

- Fabric barrier shall be placed on the ground surface of the active construction area to catch fine sediments, cement dust or other materials that are used or spilled during construction activities. All sand-size and finer construction fill and any angular

crushed rock would be removed from the construction area and disposed of at an appropriate off-site location. [

- Permanent erosion control measures and final cleanup shall be completed within 10 days of completion of the dam seismic retrofit. If this schedule cannot be met, these activities shall be completed as soon as possible. In no case shall final cleanup be delayed beyond the end of the next recommended seeding season.

- A stockpile of erosion control materials, including straw bales, silt fence, and geotextile fabric, shall be stored at the contractor yard during the entire period that construction disturbance occurs. Materials shall be stored for planned use during construction, and sufficient additional quantities shall be stored for maintenance and emergency use.

- Environmental Inspector(s) shall verify compliance with the environmental requirements throughout construction.

The following temporary erosion and sediment control measures shall be installed, where necessary during construction of the project.

SEDIMENT BARRIERS

Temporary sediment barriers (e.g., straw bales, silt fence) are designed to reduce the velocity of water flow and intercept suspended sediment conveyed by sheet flow, while allowing runoff to continue down gradient. These installations are used to limit sediment transport out of the construction area. Temporary sediment barriers shall be installed at the following locations immediately after initial ground disturbance:

- adjacent to paved roadways, drainages, wetlands (dry or wet), springs (dry or wet), impoundments (dry or wet), and other sensitive resources where the topography shall direct sediment into these resource areas;

- around soil or spoil piles, where necessary (e.g., adjacent to flowing drainages); and

- where requested by the Environmental Inspector to prevent significant sediment transport into adjacent resource areas.

General Requirements

Straw bale or silt fence sediment barriers shall be placed at the bottom of slopes and shall be located at least 6 feet from the toe of the slope, where possible, in order to increase ponding volume. The ends of the sediment barrier shall be turned upslope to capture sediment.

Sediment barriers shall be placed so as not to hinder construction activities and above the ordinary high water mark of active stream channels. If silt fences or straw bale sediment barriers are placed across the construction area, provisions shall be made for traffic flow. A gap approximately 15-feet-wide, shall be provided along the silt fence or

straw bale row, with the ends of the sediment barrier turned slightly upslope. Across the gap, a drivable earth berm shall be installed and maintained immediately upslope of the sediment barrier (upturned ends of the sediment barrier shall tie into the drivable earth berm).

If sediment builds up to greater than 40 percent of barrier capacity, the sediment shall be removed or spread on the sediment disposal site. Damaged or undermined sediment control barriers shall be repaired or replaced as described in this plan.

Straw Bales

Straw bale sediment barriers consist of a row of tightly abutted straw bales placed perpendicular to the runoff direction with the ends turned upslope. The barriers are typically one bale high, placed on the fiber-cut edge (ties not in contact with the ground) in a 4-inch-deep trench, and anchored securely with two wooden stakes driven through each bale. Soil shall be placed and compacted along the toe of the uphill side of the straw bale barrier. If a dugout area cannot be excavated due to the presence of rocky material, the Contractor shall install the straw bale so that the bale shall not be undermined.

The Contractor shall acquire weed-free straw and provide CAW with the appropriate documentation.

Silt Fences

Silt fence composed of commercial filter fabrics with sufficient strength to prevent failure shall be provided and installed by the Contractor. The height of the silt fence shall not exceed 36 inches above the ground. The fabric shall be cut from a continuous roll of fabric with splices only at the support posts. When splicing sections, at least a 6-inch overlap of fabric shall be secured and wrapped to the post(s). Support posts shall be a maximum of 10 feet apart.

The bottom edge of the silt fence shall be installed in a trench excavated approximately 4 inches wide by 6 inches deep and refilled with compacted soil, unless on-site constraints dictate otherwise (e.g., rock). If a trench cannot be excavated, the Contractor shall secure the bottom edge of the silt fence so that it shall not be undermined. Silt fences shall be attached to supporting posts by staples or wire. A typical construction drawing has been included in Attachment B. As determined by the Environmental Inspector, a wire fence may be used instead of wooden support posts to provide additional strength on hillsides.

Sandbags

Sandbags may be used as dikes or sediment barriers to control sediment in drainage swales. Sandbags can be strategically placed to control runoff, dissipate runoff energy, and catch sediment (i.e. as a “J” hook at the end of a waterbar).

Waterbars

Waterbars are utilized in various forms (e.g., rolling dips on access roads, drivable berms across travel ways, waterbars on slopes, etc.) during project construction and after final grade restoration. Waterbars are intended to intercept water traveling down a disturbed slope and divert water off disturbed soil into stable, well-vegetated, or adjacent rocky areas.

Waterbars shall be installed near the base of slopes adjacent to wetlands and drainages, except at those specific sites (e.g., terrain slopes away from a canal) where, in the judgment of the Environmental Inspector, waterbars are not necessary to prevent discharge of sediment into sensitive resources. The general spacing for temporary and permanent waterbars is as follows:

- 300 feet for slopes of 5 to 15 percent
- 200 feet for slopes of 15 to 30 percent
- 100 feet for slopes greater than 30 percent

The Environmental Inspector can modify the final spacing of waterbars in the field. Waterbar spacing is based on a site-specific evaluation of the project site and standard construction protective measures. This spacing takes into account the soils, timing of construction, and area of disturbance anticipated for construction of the project. Except for site-specific situations as determined by the Environmental Inspector (e.g., extremely long slopes with highly erodable soils), waterbars shall not be constructed on slopes with less than a 5 percent gradient.

Earthen waterbars shall be constructed of existing suitable material and compacted to increase durability. Alternatives to waterbars may include a series of tightly abutted straw bales (constructed as per Section *Straw Bales*), excelsior logs, or abutted burlap bags filled with native sand/soil. The installation angle shall be 2 to 8 percent down slope (as measured by a hand-held clinometer or level) and shall extend to, or slightly beyond, the edge of the disturbed construction area, but within the boundaries of the project area.

Where possible, waterbars shall discharge into stable, non-erosive (vegetated or rocky) receiving areas. In isolated instances where waterbars discharge into unstable or highly erosive areas without rock or vegetation, flow energy dissipaters or “J-hook” shaped sediment barriers may be positioned at the waterbar outlet. Additionally, in highly erodable soils, the spacing between waterbars may be decreased to further slow the velocity of water. Whenever feasible, waterbars shall be sited so that they do not outlet directly into sensitive resource areas (e.g., cultural sites, rare plant sites, drainages, waterbodies, wetlands, etc.).

The Contractor shall regularly inspect and repair waterbars during construction to maintain their effectiveness. Waterbars worn down by heavy construction traffic or filled with sediments shall be repaired, as needed, and the sediment shall be spread on the disturbed area uphill of the waterbar.

Check Dams

Where determined necessary by the Environmental Inspector, the Contractor shall install check dams in bar ditches or other intermittent drainages to minimize the transport of sediment from the construction zone. Check dams shall be constructed of staked straw bales or stacked sand bags just inside the drainage area edge. The center of the structure shall be lower than the ends to channel water and create a sediment dump immediately upstream of the structure. The structure, and any deposited sediment, shall be removed following final restoration of the site.

Surface Roughening

Surface roughening involves tracking of the ground surface with heavy machinery creating a series of willow depressions running parallel to the ground surface contours. Surface roughening assists in controlling erosion by reducing the speed of storm water runoff, increasing infiltration, and trapping sediment.

Topsoil Segregation

- In deep soils (more than 12 inches of topsoil), segregate at least 12 inches of topsoil shall be segregated. In soils with less than 12 inches of topsoil every effort shall be made to segregate the entire topsoil layer.

- Where topsoil segregation is required, separation of salvaged topsoil and subsoil shall be maintained throughout all construction activities.

Mulch

Mulch, consisting of weed-free straw, wood fiber, or an approved equivalent, may be applied to disturbed soils to minimize the effects of wind or rain on exposed soils. During rainy conditions, mulch reduces the impact of rainfall in initiating erosion and slows the down slope velocity of surface flow.

An acceptable application of straw mulch shall include the following:

- Straw mulch shall be required in the following areas:

  – within 100 feet of flowing streams;

  – slopes of 30 to 40 percent with less than 70 percent surface cover; and

  – slopes of 0 to 30 percent with highly wind erodable soils and less than 70 percent surface cover, as directed by the Environmental Inspector or other qualified personnel.

- Straw mulch shall be applied at a rate of 2,000 to 4,000 pounds (3,000 average) per acre, as directed by the Environmental Inspector. Mulch rates may be reduced or eliminated by the Environmental Inspector, where necessary.

- Straw fiber length shall be at least 8 inches long to facilitate crimping in place after application.

- Equipment specifically designed to crimp straw shall be used to crimp straw fibers to a depth of 2 to 3 inches. Steep slopes inaccessible with a crimper shall be crimped by tracking with tracked equipment running perpendicular to the slope. Farm discs shall not be allowed for crimping. Acceptable straw mulch crimpers include:

  – mechanical crimper;

  – backhoe with crimper forks;

  – tracked equipment tracking up and down slopes (restricted to areas where other methods shall not work); or

  – equivalent, as approved by the Environmental Inspector.

- If a straw mulch blower is used, strands of the mulching material shall be at least 8 inches long to allow anchoring. Alternatively, organic liquid mulch binders may be used in accordance with the manufacturer's recommendations and with CAW's approval.

If reclamation and seeding is deferred more than 10 days after final grade restoration, all disturbed slopes above waterbodies and wetlands shall be temporarily stabilized by applying 3 tons of dry straw mulch per acre for a minimum distance of 100 feet above the edge of the waterbody or wetland.

After final restoration and seeding, mulch shall be applied to all dry sandy sites, slopes greater than 8 percent, and all slopes within 100 feet of waterbodies to control erosion. Mulch shall be spread over the area to a visible coverage of at least 75 percent of the ground surface and at a rate of 2 tons of dry straw (or functional equivalent) per acre.

Matting/Netting

Where determined necessary by the Environmental Inspector and/or Construction Inspector, erosion control matting shall be installed along the stream banks of flowing streams and steep slopes (greater than 33 percent) after final grade restoration to reduce rain impacts on soils, to control erosion, and to stabilize steep slopes and waterbody banks.

The Contractor shall use matting supplied in continuous rolls of 30 feet or greater with a minimum width of 4 feet. Staples shall be made of wire, 0.09 inch in diameter or greater, and have a "U" shape with legs 8 inches in length and a 2-inch crown. Wire staples shall

be driven into the ground for the full length of the staple legs. Alternatively, wood pegs (0.5-inch-diameter) may be used to secure the erosion control fabric. In areas of active livestock grazing, protection measures other than fabric must be used.

Matting shall be anchored, as it is unrolled to prevent stretching of the material and incomplete ground contact. For stream bank installations, mats shall be laid parallel (upper mat overlapping lower mat in a shingle pattern) to the waterbody to a point above the top of the bank. Native materials (e.g., rocks, logs, etc.) may be used in conjunction with the matting to aid in bank stabilization.

During regular erosion control monitoring, erosion control matting shall be inspected for washouts, adequate staking, and loss of matting. Damaged or undermined matting shall be repaired or replaced, as necessary.

Dewatering Wetlands and Other Waters of the U.S.

Dewatering shall be conducted in a manner that does not cause erosion and does not result in heavily silt-laden water flowing into any wetland. Dewatering structures shall be removed as soon as possible after the completion of dewatering activities.

Cofferdams shall be constructed of clean river-run gravel. Cofferdams shall be installed no earlier than May and removed in October. If existing flows are less than the 50 cfs bypass capacity, the cofferdams could be installed as early as April 15th or removed as late as November 30th.

Under the Proponent's Proposed Project and Alternatives 1, 2, and 3, temporary fill shall be placed in the plunge pool and at the upper end of the plunge pool access road. The following measures shall be implemented for this activity.

- The plunge pool staging area shall be filled with spawning-sized gravel and topped with a visqueen liner and a layer of crushed rock and/or sand to create a working surface.

- When construction is complete, the surface layer and liner shall be removed off-site and the gravels used to augment spawning habitat in the plunge pool tailwater and downstream.

- The plunge pool access road shall be upgraded to a one lane, two-way road with pullouts to minimize road widening and loss of wetlands and riparian vegetation.

Wetlands

When the construction activities encounter wetlands, CAW shall protect and minimize potential adverse impacts to wetlands by:

- Expediting construction in and around wetlands, and limiting the amount of equipment and mainline construction activities within wetlands to reduce disturbances of wetland soils;

- Restoring wetlands to their original configurations and contours;

- Permanently stabilizing upland areas near wetlands as soon as possible after completion of ground disturbing work; and

- Inspecting the project area periodically during and after construction and repairing any erosion control or restoration features until vegetation is successfully established on the upland portions of the project area.

Waterbodies

CAW shall protect and minimize potential adverse impacts to perennial waterbodies by the following protective measures:

- Expediting construction and limiting the amount of equipment and activities in waterbodies;

- Reducing clearing, leaving in place as many trees as possible on stream banks;

- Removing all temporary construction material and temporary structures from the waterbody after construction;

- Restoring stream channels and bottoms to their original configurations and contour except where modification is part of the project;

- Permanently stabilizing stream banks and adjacent upland areas after construction; and

- Inspecting the project area periodically during and after construction and repairing any erosion controls and/or performing restoration, as needed, in a timely manner.

Restoration

Cleanup

After final construction on the dam, all disturbed portions of the construction area, including the access roads, and staging areas, shall be returned to preconstruction grades and contours. Construction debris shall be removed from the project sites and these sites shall be graded where appropriate and decompacted so that the soil is left in the proper condition for planting. Any necessary permanent water bars (constructed in the same manner as temporary waterbars) shall be constructed after final grading and prior to seeding.

Temporary sediment barriers shall be removed when replaced by permanent erosion control measures or when revegetation is successful. Every effort shall be made to complete final cleanup and installation of permanent erosion control measures within 10 days after final activities at each site are complete. If this schedule cannot be met, final cleanup shall be completed as soon as possible. In no case shall final cleanup be delayed beyond the end of the next recommended seeding season. Sediment barriers left in place after construction shall be limited to earthen berms, waterbars, and diversion swales, although silt fence may be left in place in specific locations at the direction of the Environmental Inspector.

CAW shall file with appropriate permitting agencies for the review and written approval, a winterization plan if construction shall continue into the winter season when conditions could delay successful decompaction, topsoil replacement, or seeding until the following spring.

Reclamation, including alleviating soil compaction, final seedbed preparation, and revegetation, shall occur immediately after final cleanup. Seeding may be postponed until conditions allow (e.g., time of year, soil moisture, or weather conditions). In no case shall seeding be postponed past the next seeding season.

Reclamation and revegetation of the project site incorporates permanent erosion and sediment control measures. However, if final restoration cannot occur in a timely manner due to weather or soil conditions, temporary erosion and sediment control measures shall be employed until the weather is suitable for final cleanup and revegetation. In no case shall final cleanup be delayed beyond the end of the next recommended seeding season. If final reclamation or reseeding is delayed more than 30 days before the perennial vegetation seeding season, areas adjacent to waterbodies shall be mulched with 3 tons/acre of straw, or its equivalent, for a minimum of 100 feet on either side of the waterbody.

Revegetation of Disturbed Areas

Disturbed areas shall be immediately revegetated upon completion of road improvements using permanent revegetation to replace trees, shrubs, and grasses. Cut slopes, fill areas, denuded areas, and any other areas where existing vegetation cover shall be removed outside the roadway shall be revegetated with an appropriate seed mix or seedlings. Additional detail regarding permanent revegetation is provided in *Section 5 Revegetation* of this Plan.

If there is insufficient time prior to the runoff season to permanently revegetate impacted areas, temporary erosion control and revegetation actions shall be implemented for any winter season prior to completion of the project. Temporary over-winter erosion control and revegetation actions may include such methods as the use of geofabrics and hydroseeding to provide an annual ground cover until the spring growing season when more permanent revegetation methods shall be implemented. Installation of any

geotextile or mechanical over-wintering protection shall be properly installed to prevent undermining or washout during winter rains.

The project site shall be seeded within 6 working days of final grading in accordance with recommended seeding dates, weather and soil conditions permitting. Slopes steeper than 3:1 shall be seeded immediately after final grading in accordance with recommended seeding dates, weather permitting.

For temporary or permanent seeding following construction, the following measures shall be implemented.

Seeding Requirements

Seed mixes shall be selected with the assistance of a qualified revegetation specialist with demonstrated experience and expertise in revegetation, and shall contain native species that are indigenous to the project area. If more than one type of seed mix is needed, the seed mixes shall be assigned to project construction and mitigation areas with the assistance of the qualified revegetation specialist. If enough native seed is not available and non-natives must be included in the seed mix, these would be species known not to be invasive or persistent. The seed mix shall contain native species known to compete well against invasive non-native species.

The project site shall be seeded within 6 working days of final grading in accordance with recommended seeding dates, weather and soil conditions permitting. Slopes steeper than 3:1 shall be seeded immediately after final grading in accordance with recommended seeding dates, weather permitting.

Seeding of permanent vegetation shall be performed within the recommended seeding dates. If seeding cannot be done within those dates, use appropriate temporary erosion control measures discussed above and perform seeding of permanent vegetation at the beginning of the next recommended seeding season.

Prior to application of the seed, the seedbed shall be prepared to depth of 3 to 4 inches using appropriate equipment to provide a firm, smooth seedbed that is free of debris. For broadcast and hydro-seeding, the seedbed shall be scarified to ensure sites for seeds to lodge and germinate. The seed shall be applied and covered uniformly per local soil conservation authorities' recommendations for the seed mixture being applied. A range drill shall be used on many of the disturbed sites; however, broadcast or hydro-seeding may also be used at double the recommended seeding rates. Where broadcast seeding is used, the area shall be lightly raked or dragged with appropriate equipment after seeding to lightly cover the seeds.

Seed shall be purchased in accordance with the Pure Live Seed specifications for seed mixes and used within 12 months of testing. Legume seed shall be treated with a species-specific inoculate per manufacturer's specifications.

Reporting

CAW shall maintain records that identify:

- method of application, application rate, and type of fertilizer, pH modifying agent, seed, and mulch used;
- acreage treated;
- dates of backfilling and seeding; and
- any problem areas and how they were addressed.

CAW shall file with the Corps, USFWS, State Water Board, and CDFG quarterly activity reports documenting problems and corrective actions taken for at least 2 years following Phase 1 Construction. Activity reports documenting post-construction problems shall be filed only during quarters where problems have been identified. This shall alleviate the time, expense, effort, and paperwork associated with reporting non-events.

1.5 RESTORATION AND MITIGATION FOR WETLANDS AND OTHER WATERS OF THE U.S.

Mitigation for permanent loss of wetlands and OWUS includes restoration, mitigation and monitoring for wetlands and Other Waters affected by the project. Riparian and fringe palustrine emergent wetlands similar in function (streamside habitat) to the lost acreage would be created or restored at a 3:1 ratio. Revegetation and monitoring programs are outlined in Section 6 Revegetation Plan.

For impacts to Other Waters, mitigation may consist of stream channel improvements either along the Carmel River upstream from the Project Area or along other streams in the watershed. The Project Proponent may either conduct the work or provide funding to other property managers for projects that restore natural channel conditions. Restoration sites may be located in lands along the Carmel River owned by the Project Proponent or on streams elsewhere in the watershed. Restoration sites shall be conserved in perpetuity.

The following measures shall be implemented for Project-affected wetlands or OWUS under the Proponent's Proposed Project and Alternatives 1 through 4.

RESTORATION IN WETLANDS OR OTHER WATERS OF THE U.S.

- Construction areas shall be reconstructed as necessary to maintain the original wetland hydrology.
- A conceptual restoration plan that includes should include measures for re-establishing herbaceous and/or woody species, controlling the invasion and spread of undesirable exotic species, and monitoring the success of the revegetation and

weed control efforts is provided in Section 6. Permitting agencies shall be consulted prior to finalizing the details of this plan.

- Restoration of all disturbed areas in wetland habitat shall meet performance criteria for revegetation with wetland herbaceous and/or woody plant species, as specified in the final plan.

- Temporary sediment barriers located at the boundary between wetland and adjacent upland areas shall be removed after upland revegetation and stabilization of adjacent upland areas are judged to be successful.

POST-CONSTRUCTION MAINTENANCE

- Vegetation maintenance shall not be conducted over access roads in wetlands. However, to facilitate dam inspection and maintenance surveys, a corridor up to 10 feet wide may be maintained in a herbaceous state.

- Herbicides or pesticides shall not be used in or within 100 feet of a wetland, except as allowed by the appropriate land management agency or state agency.

- The success of wetland revegetation shall be monitored and recorded annually for the first 3 years after construction or until wetland revegetation is successful. At the end of 3 years after construction, a report shall be filed with the Corps identifying the status of the wetland revegetation efforts. The report shall include the percent cover achieved and problem areas (weed invasion issues, poor revegetation, etc.). If the performance criteria are not met at the end of the first 3 years after construction, a report shall be filed annually until wetland performance criteria are met.

- Wetland revegetation shall be considered successful if the cover of herbaceous and/or woody species is at least 50 percent of the type, density, and distribution of the vegetation in adjacent wetland areas that were not disturbed by construction. If revegetation is not successful at the end of 3 years, a remedial revegetation plan to actively revegetate the wetland shall be developed and implemented (in consultation with a professional wetland ecologist). Revegetation efforts shall be continued until wetland revegetation performance criteria are met.

1.6 REVEGETATION PLAN

To meet the goals of the revegetation component of this Plan the following measures shall be implemented immediately following completion of construction. All work shall be conducted under the supervision of a qualified botanist.

OAK TREES

A conservation easement shall be provided or acquired that is sufficient to mitigate at least half the loss of oak trees, per Monterey County Code (2005). The conservation easement shall consist of lands elsewhere in the Carmel River watershed that support undeveloped blue oak stands.

If insufficient space is available in areas where protected oaks are lost, additional mitigation sites for shall be identified within the Carmel River watershed, as feasible.

Up to half of the oak trees removed by access road and right abutment wall construction shall be replaced at a 3:1 ratio by planting seedlings or potted trees in appropriate habitat. All plant material shall be derived from Carmel Valley area populations.

Fertilizers may promote the growth of exotic weeds, to the detriment of native species. Fertilizers and soil pH modifiers shall be used only in accordance with written recommendations obtained from a qualified revegetation specialist. Any recommended soil pH modifier and fertilizer shall be incorporated into the top 2 inches of soil as soon as possible after application.

RIPARIAN VEGETATION

Lost riparian vegetation shall be revegetated at a 3:1 ratio for trees removed, including the cottonwood-sycamore riparian forest below San Clemente Dam at the plunge pool staging area and access road, and any riparian species disturbed at the site of the right abutment wall.

Riparian and fringe palustrine emergent wetlands similar in function (streamside habitat) to the lost acreage shall be created or restored at a 3:1 ratio, grading as necessary and placing cuttings or seedlings in appropriate habitat under the supervision of a qualified botanist. Seedlings shall be from Carmel Valley area populations.

If insufficient space is available in areas where riparian vegetation is lost, additional mitigation sites for riparian revegetation shall be identified, as outlined in Section 5 of this Plan.

MONITORING AND MAINTENANCE

A monitoring and maintenance program shall be implemented following revegetation in riparian and upland areas.

Upland Vegetation

Plantings shall be monitored during years one, two, three, five and ten after planting. Annual follow-up inspections of all revegetated areas shall be conducted after the growing season to determine the success of revegetation. Monitoring during year ten shall be conducted to assess long-term survival of plantings, particularly trees.

The functions and values of the revegetated areas are expected to match or exceed the functions and values of surrounding areas during and beyond the monitoring period. A variety of environmental parameters shall be monitored in the revegetated areas. These parameters shall be used to assess the success of the revegetation relative to established performance criteria. Performance criteria are based on existing conditions currently present in oak woodland and riparian habitats in or near the Project Area.

Monitoring data shall include 1) a list of plant species; 2) the frequency of occurrence by plant species; 3) relative percent cover by species; and 4) survival of replanted trees. Revegetation efforts shall continue for at least five years and/or until revegetation is successful.

Revegetation shall be considered successful if 1) within ten years of planting, the survival rate of the planted oaks and riparian tree species is 75 percent and 2) planted seedlings survive for a period of at least 10 years.

If the revegetation does not meet the performance criteria, remediation shall be implemented. Remedial actions shall be taken, as necessary, including but not limited to irrigation or protection from browsing animals such as deer, to ensure long-term survival of the plantings per the requirements of Title 16, Chapter 16.60, Monterey County Code. Drainage and irrigation systems shall be monitored and problems corrected until restoration is successful.

Additional seedlings shall be planted to replace seedlings that do not survive. If at any time during the monitoring program the survival rate of the planted trees falls below the target 75 percent survival rate, additional trees shall be planted.

Other remedial mitigation measures may be implemented within the 10-year monitoring period to ensure success criteria are met. For example, additional tree planting may be implemented to compensate for excess mortality of the initial tree planting. If exotic vegetation is causing failure of the native vegetation cover to meet targets, control methods shall be increased to counter this effect.

Riparian Vegetation

Replacement plantings shall be monitored annually for at least five years. Seedlings shall be replanted as necessary to ensure long-term survival.

Restoration sites shall be monitored for five years. Performance criteria shall be agreed upon with the Corps and CDFG, but shall include cover criteria for native vegetation (ranging from 50 to 75 percent) and survival criteria for woody vegetation that is planted. All disturbed areas shall meet performance criteria for revegetation with wetland herbaceous and/or woody plant species.

Wetland Vegetation

The success of wetland revegetation shall be monitored and recorded annually for the first 3 years after construction or until wetland revegetation is successful. At the end of 3 years after construction, a report shall be filed with the Corps identifying the status of the wetland revegetation efforts. Included in the report shall the percent cover achieved and problem areas (weed invasion issues, poor revegetation, etc.). A report shall continue to be filed annually until wetland performance criteria are met.

Wetland revegetation shall be considered successful if the cover of herbaceous and/or woody species is at least 50 percent of the type, density, and distribution of the vegetation in adjacent wetland areas that were not disturbed by construction. If revegetation is not successful at the end of 3 years, a remedial vegetation plan shall be developed and implemented (in consultation with a professional wetland ecologist) to actively revegetate the wetland. Revegetation efforts shall continue until wetland revegetation is successful.

Reporting

CAW shall file annual reports with appropriate county, state and federal permitting agencies, including the Corps, USFWS, CDFG, and Monterey County following within six months of the conclusion of each annual monitoring period. A summary report shall be issued after year ten, the final year of monitoring.

1.7 REFERENCES

Monterey County Code. 2005. Title 16 Environment, Chapter 16.60 Preservation of oak and other protected trees.

California American Water Company (CAW). 2007. Storm Water Pollution Prevention Plan.

Appendix V

PROTECTION MEASURES FOR SPECIAL STATUS SPECIES

San Clemente Dam Seismic Retrofit Project

Protection Measures for Special Status Species

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PROTECTION MEASURES FOR SPECIAL STATUS SPECIES DURING CONSTRUCTION

1. INTRODUCTION

Implementation of activities related to the San Clemente Dam Seismic Retrofit Project (Project) has the potential to affect special-status species within and near the Project area. The Protection Measures for Special Status Species Plan (Plan) identifies measures to be taken by the California-American Water Company (CAW), (otherwise referred to as "applicant" on future actions relating to this project) and its contractors (Contractor) to ensure that avoidance and minimization measures are implemented during Project construction activities to protect special-status species in accordance with federal, state, and local regulations. Measures identified in this Plan apply to work within the Project Area defined as the construction area, access roads, all work and storage areas, and other areas used during construction of the project. This Plan also identifies mitigation measures.

This document identifies which measures will be implemented for the Proponent's Proposed Project or an alternative action. The project alternatives include the following.

- Proponent's Proposed Project – Dam Thickening
- Alternative 1 – Dam Notching
- Alternative 2 – Dam Removal
- Alternative 3 – Carmel River Reroute and Dam removal
- Alternative 4 – No Project (No Action)

This Preliminary Draft Plan shall be finalized with review and comments from agencies and organizations with regulatory authority in the management of special-status wildlife and aquatic species. These agencies include the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS) and California Department of Fish and Game (CDFG). Review and comments also will be sought from the U.S. Army Corps of Engineers (Corps), lead agency for consultation on the Project.

This Plan will be consistent with any local or regional plans, policies, and regulations protecting any special status species and their habitat identified by the USFWS, NMFS, or CDFG. These measures will be implemented by CAW as "applicant" and its contractors unless superseded by specific written requirements or recommendations from the USFWS or NMFS as a result of Section 7 consultation under the Endangered Species Act. It will be modified, if needed, to be consistent with a future, adopted Habitat Conservation Plan, or other approved local, regional, or state habitat conservation plan.

1.1. SPECIAL-STATUS SPECIES WITHIN THE PROJECT VICINITY

Special-status species include plant and wildlife species listed by the U.S. Fish and Wildlife Service (USFWS) and by the National Marine Fisheries Service (NMFS) as Threatened or

Endangered under provisions of the Federal Endangered Species Act (ESA) of 1973 (16 USC 1531 et. seq., as amended), as well as Proposed and Candidate species for listing. Special-status species also include species listed as threatened or endangered by the California Department of Fish and Game (CDFG) under provisions of the 1984 California Endangered Species Act (CESA) (CDFG 1994, 1997), and plant species listed as Rare, Threatened, or endangered by CDFG under provisions of CESA and the 1977 Native Plant Protection Act (NPPA) (CDFG 1996). Wildlife species listed by CDFG as Species of Special Concern (CDFG 1994) also are special-status species.

Special-status species include plant species included on List 1A (Plants Presumed Extinct in California), List 1B (plants rare, threatened, or endangered in California and elsewhere), or List 2 (plants rare, threatened, or endangered in California, but more common elsewhere) of the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants of California (CNPS 2001). These species are subject to State regulatory authority under the California Environmental Quality Act (CEQA). Plant species included on Lists 3 and 4 of the CNPS Inventory could be also considered special-status species. These species are considered to be of lower sensitivity. They generally do not fall under specific State or Federal regulatory authority, and specific mitigation considerations are generally not required for these species.

The potential for special-status plant species to occur in the Project vicinity was determined based on a review of literature and special-status species databases, as well as botanical surveys conducted in 1997 and 2005 (Yadon 2005). Only two special-status plant species, virgate eriastrum (*Eriastrum virgatum*) and Lewis's clarkia (*Clarkia lewisii*) were found in the project vicinity. One small population of virgate eriastrum (an annual species), consisting of 20 to 30 plants in 1997, was found at the eastern edge of the floodplain of the Carmel River in the northern portion of the project vicinity (Ecosystems West 1997). Virgate eriastrum is on List 4 of the California Native Plant Society (CNPS) Inventory, and does not fall under specific State or Federal regulatory authority. Lewis's clarkia was found along the jeep trail that is a proposed access route for Alternatives 1, 2, and 3, as well as the proposed sediment disposal site for Alternatives 1 and 2, and the diversion dike area for Alternative 3. This species is also a CNPS List 4 taxon.

Several special-status terrestrial wildlife species are known to occur or may occur in the Project vicinity (MPWMD 1984). A list of special-status wildlife species with potential to occur in the Project area was developed based on a review of literature and data sources that span over 90 years, including general wildlife references (Ingles 1965, Call 1978, Stebbins 2003, Small 1994); CDFG reports on special-status wildlife (Remsen 1978, Williams 1986, Jennings and Hayes 1994); California Wildlife Habitat Relationships (CWHR) species-habitat models (Zeiner et. al. 1988, 1990a, 1990b), records from the California Natural Diversity Database (CNDDB 2005), the catalogue records of the major northern California vertebrate museum collections (California Academy of Sciences 2005, Museum of Vertebrate Zoology 2005). Records of known occurrences of special-status wildlife species and habitats in the region, previous wildlife studies conducted in the area, and consultant staff biologist's experience with the target species from the 2000 RDEIR were also used.

Biotic resources surveys of the project study vicinity were conducted by Ecosystems West in from April to August, 1997, with follow-up surveys during July 1998. Dr. Richard Arnold conducted a survey for Smith's blue butterfly in June 1997. ENTRIX, Inc. conducted additional field surveys from April to August 2005, including vegetation and special-status plant surveys. Special-status plant species surveys were conducted in May and July 2005. Surveys were conducted throughout the project area, including along the Tularcitos access road and existing access roads requiring improvements, at the concrete batch plant site, at the dam itself (including the fish ladder), at the sediment disposal site, along the conveyor route to the sediment disposal site, and in those areas where sediment will be excavated.

Special-status wildlife species documented as occurring in the study area include: California red-legged frog (*Rana aurora draytonii*), foothill yellow yellow-legged frog (*Rana boylii*), western pond turtle (*Actinemys* [=*Clemmys*] *marmorata*), two striped garter snake (*Thamnophis hammondii*), Monterey dusky-footed wood rat (*Neotoma fuscipes luciana*), Cooper's hawk (*Accipiter cooperi*), osprey (*Pandion haliaetus*), and yellow warbler (*Dendroica petechia brewster*). A single, nonbreeding willow flycatcher (*Empidonax traillii*) was reported in May 1997 in riparian habitat considered suboptimal for the species. No other Federal or State listed threatened or endangered bird species was found in the Project Area. Numerous California red-legged frogs have been documented upstream and downstream of San Clemente Dam. The available habitat for foothill yellow-legged frog is marginal, but one specimen was observed in 2005 in San Clement Creek, within one mile of the dam. Western pond turtles have been observed downstream from San Clemente Dam and potential habitat occurs on the site.

Potentially suitable habitat for other special-status wildlife species also exists in or near the Project Area, including: California tiger salamander (*Ambystoma californiense*), Coast Range newt (*Taricha torosa torosa*), coast horned lizard (*Phrynosoma coronatum*), Townsend's big-eared bat (*Plecotus townsendii townsendii*), California mastiff bat (*Eumops perotis californicus*), pallid bat (*Antrozous pallidus*), double-crested cormorant (*Phalacrocorax auritus*), sharp-shinned hawk (*Accipiter striatus*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), and yellow-breasted chat (*Icteria virens*). No Smith's blue butterflies (*Euphilotes enoptes smithi*), suitable habitat or preferred host plants were detected during the surveys.

Federally-listed Steelhead is the most important management species of the fish species present in the Carmel River watershed. It is a Fish Species of Special Concern in California (CDFG 1995).

Special status species with the potential to occur within the Project Area are summarized in Table 1.

Table 1: Special Status Species with Potential to Occur in Vicinity of the Project Area			
Species	**Scientific Name**	**Federal Status**	**State Status**
Plant species			
Virgate eriastrum	*Eriastrum virgatum*	None	List 4 of the CNPS[1]
Lewis's clarkia	*Clarkia lewisii*	None	List 4 of the CNPS[1]
Fish species			
Steelhead	*Oncorhynchus mykiss*	ESA - Threatened	California Species of Special Concern
Wildlife species - documented in Project Area			
California red-legged frog	*Rana aurora draytonii*	ESA - Threatened	California Species of Special Concern
Foothill yellow-legged frog	*Rana boylii*	None	California Species of Special Concern
Western pond turtle	*Actinemys* [=*Clemmys*] *marmorata*	None	California Species of Special Concern
Two striped garter snake	*Thamnophis hammondii*	None	California Species of Special Concern
Monterey dusky-footed wood rat	*Neotoma fuscipes luciana*	None	California Species of Special Concern
Cooper's hawk	*Accipiter cooperi*	None	California Species of Special Concern
Osprey	*Pandion haliaetus*	None	California Species of Special Concern
Yellow warbler	*Dendroica petechia brewster*	None	California Species of Special Concern
Willow flycatcher	*Empidonax traillii*	None	CESA Endangered, 1991 (includes all subspecies)
Wildlife species – suitable habitat occurs, individuals not documented			
California tiger salamander	*Ambystoma californiense*	ESA - Threatened	California Species of Special Concern
Coast Range newt	*Taricha torosa torosa*	None	California Species of Concern
Coast horned lizard	*Phrynosoma coronatum*	None	California Species of Special Concern
Townsend's big-eared bat	*Plecotus townsendii townsendii*	None	California Species of Special Concern
California mastiff bat	*Eumops perotis californium*	None	California Species of Special Concern
Pallid bat	*Anatropous pallid us*	None	California Species of Special Concern
Double-crested	*Phalacrocorax auritus*	None	California Species of

Table 1: Special Status Species with Potential to Occur in Vicinity of the Project Area			
Species	**Scientific Name**	**Federal Status**	**State Status**
Plant species			
cormorant			Special Concern
Sharp-shinned hawk	*Accipiter striatus*	None	California Species of Special Concern
Bald eagle	*Haliaeetus leucocephalus*	ESA – Threatened, delisted June 2007[2]	California Endangered Species
Golden eagle	*Aquila chrysaetos*	None	California Species of Special Concern
Yellow-breasted chat	*Icteria virens*	None	California Species of Special Concern

[1] California Native Plant Society (CNPS) Inventory, List 4 species generally do not fall under specific State or Federal regulatory authority, and specific mitigation considerations are generally not required for these species.

[2] USFWS Ruling on delisting June 29, 2007.

2. PURPOSE

The purpose of this plan is to establish standards and measures to avoid or minimize potential adverse effects to federal and state listed wildlife and plants that inhabit areas that may be affected by Project construction activities, and to benefit California Species of Special Concern.

3. RESPONSIBILITIES AND COORDINATION

This Plan will be implemented by CAW and the Contractor on the project site. CAW and the Contractor have the responsibility for providing all necessary guidance on the project site to their respective employees, and operating under the requirements of this Plan. Prior to construction, the "applicant" will contact the appropriate authorities to establish communications, obtain permits (as applicable), and/or fulfill other obligations as directed by regulatory agencies.

3.1. SUPERVISION, INSPECTION AND MONITORING

Environmental Inspectors will be designated to implement supervision and inspection activities during construction and post-construction activities. The Environmental Inspector will be responsible for ensuring compliance with the requirements of this Plan, the environmental conditions of the applicable permits, the mitigation measures required by environmental permits, other environmental permits and approvals, and environmental requirements in landowner easement agreements.

The Environmental Inspector will verify that the limits of authorized construction work areas and locations of access roads are properly marked before construction begins; and verify the location of signs and highly visible flagging marking the boundaries of sensitive resource areas, or areas with special requirements along the construction work area.

The "applicant" will designate a field contact representative (FCR) who will be responsible for overseeing compliance with protective stipulations for listed species. The FCR must be on site during all Project activities. The FCR shall have authority to halt all activities that are in violation of the stipulations. The FCR shall have a copy of all stipulations when work is being conducted on the site. The FCR may be a project manager, CAW representative, or a contract biologist.

The FCR will have the authority to halt all non-emergency Project activity should danger to a listed species arise. Work shall proceed only after hazards to the listed species are removed, the species is no longer at risk, or the individual has been moved from harm's way by the authorized biologist.

All listed species surveys and monitoring work within areas where pre-construction surveys have demonstrated the potential to affect one or more listed species will be accomplished by a qualified biologist. The biologist will be responsible for assisting crews in compliance with protection measures, performing surveys prior to implementation of construction activities, as needed, to locate and avoid sensitive species, and monitoring compliance.

CAW as "applicant" will ensure that activities are confined to the authorized work areas by means of project assessments. The assessments may be conducted by the authorized biologist. Should the assessment find that maintenance activities extended beyond the approved work areas, the Corps, USFWS, and CDFG shall ensure that the "applicant" and its contractors use appropriate measures to restore the disturbed areas.

This Plan and a copy of the Notice of Intent will be kept at all of the construction sites (if practical) or at the nearest contractor office or trailer. This Plan will be available to a responsible agency representative upon request.

3.2. EDUCATION PROGRAM

All "applicant" employees and Contractors involved with construction activities will be required to attend a special-status species education program. Aspects of the program addressing special-status species subject to regulatory authority of the USFWS, NMFS and CDFG will be approved by those agencies. All construction and monitoring employees will participate in the education program prior to initiation of activities. New employees will receive formal, approved training prior to working on-site. At a minimum, the program will cover the distribution of listed species, general behavior and ecology of these species, sensitivity to human activities, legal protection, penalties for violation of state and federal laws, reporting requirements, and Project avoidance, minimization and mitigation measures.

3.3. REPORTING

Encounters with a listed species shall be reported to an authorized or qualified biologist. These biologists will maintain records of all listed species encountered during Project construction activities. This information will include for each individual: the location (narrative, vegetation type, and maps) and date of observation; general conditions and health; any apparent injuries and

state of healing, and; if moved, the location from which it was captured and the location in which it was released.

Within 60 days of completion of construction activities, the FCR and authorized biologist shall prepare a report for the Corps, USFWS, NMFS, and CDFG documenting the effectiveness and practicality of the measures in this Plan. The report also will make recommendations for modifying the measures in this Plan to enhance species protection or improve the utility of the permit. The report will provide information on the actual acreage disturbed by various aspects of the operation.

4. PROTECTION MEASURES - GENERAL MEASURES

4.1. PRECONSTRUCTION SURVEYS

Pre-construction surveys for listed plant and wildlife species will be conducted according to USFWS and CDFG protocols. Alternatively, surveys for potential habitat of special-status species will be conducted in the area of construction locations. Surveys and habitat assessments previously conducted for San Clemente draw-down operations will be used to help focus surveys in areas where species occurrence and/or presence of suitable habitat for special-status species have been documented.

A pre-construction survey of the Project Area will be conducted by a qualified biologist(s) no more than 14 days prior to the onset of activities. Burrows or nests of special-status species outside of, but near, the construction area will be prominently flagged at that time so that they may be avoided during work activities. Construction actions will avoid disturbing such sites to the extent possible. In the event an occupied habitat is found within the proposed construction site, a qualified biologist will be on-site during construction.

4.2. CONSTRUCTION MEASURES

All surface-disturbing activities within the range of any listed species will be conducted in a manner that reduces, as much as possible, the potential for take of individuals of a listed species. Impacts to habitat will also be minimized to the maximum possible extent.

The area of disturbance will be confined to the smallest area practicable, considering topography, placement of facilities, location of potential special-status species habitat, nesting sites or dens, public health and safety, and other limiting factors. As needed, work area boundaries will be delineated with flagging or other marking to minimize surface disturbance associated with vehicle straying. Special habitat features identified by the qualified biologist, will be avoided to the extent possible. To the extent possible, previously disturbed areas within the Project sites will be used for the stockpiling of excavated materials, storage of equipment, locations of trailers, parking of vehicles, and any other surface-disturbing activity. The qualified biologist, in consultation with the “applicant”, will ensure compliance with these measures.

- All activities will be restricted to pre-determined areas. If unforeseen circumstances require expansion of these areas, the potential expanded work areas shall be surveyed for listed

species prior to use of the area. All appropriate mitigation measures will be implemented within the expanded work areas based on the judgment of the regulatory agencies and CAW's biological consultant. Work outside of the original work area will proceed only after receiving written approval from the Corps, USFWS, NMFS and/or CDFG, depending on regulatory authority, describing the exact location of the expansion.

- Established routes of travel to and from the construction and inspection sites will be used. Cross-country use of vehicles and equipment will be strictly prohibited. During project activities, vehicle parking and material stockpiles will be located in existing disturbed areas to the extent practicable.
- Employees will exercise caution when commuting to the Project area and while traveling the Project Area during construction activities. To minimize the likelihood for vehicle strikes of listed species, speed limits when commuting to project areas on project roads will not exceed 20 miles per hour.
- All construction pipes, culverts, or similar structures that are stored at a construction site for one or more nights will be inspected before the pipe is used or moved. If wildlife species are present, they will be allowed to exit on their own or an authorized biologist will move them out of harm's way.
- Trash and food items will be contained in closed containers and removed daily to reduce attractiveness to opportunistic predators such as common ravens (*Corvus corax*), coyotes (*Canis latrans*), and feral dogs.
- Employees will not bring pets to the Project site.
- Firearms will be prohibited from the activity sites.
- Upon completion of each activity on a Project site, all unused material and equipment will be removed from the site.

Spill control measures will be implemented to minimize the risk of contamination of the Carmel River downstream of the project area. CAW will implement a Spill Prevention, Containment, and Countermeasure (SPCC) Plan during construction of improvements to the San Clemente Dam Seismic Retrofit Project (CAW 2007a). This SPCC Plan outlines specific preventive measures and practices to reduce the likelihood of an accidental release of a hazardous or regulated liquid and to expedite cleanup of any release that may occur during construction activities. For emergency situations involving a leak or spill or any other immediate safety hazard, the "applicant" will notify the appropriate regulatory field office, as outlined in the SPCC. As a part of this emergency response, the USFWS, NMFS, and CDFG may require specific measures to protect listed species. During cleanup and repair, the agencies also may require measures to recover damaged habitats.

Sediment erosion control measures will be implemented, as described in the Stormwater Pollution Prevention Plan (CAW 2007a) and the Botanical Resources Management Plan (CAW 2007b). Disturbed areas will be revegetated, as described in the Botanical Resources Management Plan.

Upon locating an individual of a dead or injured special-status species, the "applicant" will make initial notification to USFWS, NMFS and/or CDFG, consistent with regulatory authority, within 3 working days of its finding. The notification for special status wild-life species must be made

by telephone and writing to the Ventura Fish and Wildlife Office (2493 Portola Road, Suite B, Ventura, California 93003, (805) 644-1766). Notification for steelhead must be made to NMFS and CDFG. The report shall include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death (if known), and other pertinent information. Animals injured through "applicant" activities shall be transported to a qualified veterinarian for treatment at the expense of the "applicant". If an injured animal recovers, the CDFG will be contacted for final disposition of the animal.

The "applicant" will endeavor to place the remains of intact special-status species with educational or research institutions holding the appropriate state and federal permits per their instructions. If such institutions are not available or the animal's remains are in poor condition, the information noted above shall be obtained and the carcass left in place. Arrangements regarding proper disposition of potential museum specimens shall be made with the institution by the Corps, USFWS, NMFS, and/or CDFG through a biologist prior to implementation of the action. Animals injured by project activities should be transported to a qualified veterinarian. Should any treated animals survive, the appropriate agency field offices should be contacted regarding the final disposition of the animals.

Where necessary, CAW will restore disturbed areas in a manner that will assist in the re-establishment of biological values within the disturbed area. Methods of such restoration will include the reduction of erosion, re-spreading of topsoil, and planting with appropriate native shrubs, depending upon the appropriateness or effectiveness in a given area. Restoration activities will be consistent with measures provided in the Botanical Resources Management Plan (CAW 2007b).

4.3. CONSTRUCTION MEASURES FOR SPECIFIC ACTIVITIES (AND ASSOCIATED WILDLIFE AND FISH IMPACTS)

Channel Dewatering

Under the Proponent's Proposed Project, Alternative 1, 2 or 3, the plunge pool and up to about 400 feet of Carmel River channel downstream the San Clemente Dam will be dewatered during construction. Under the Proponent's Proposed Project, the Carmel River will not be dewatered to upgrade the piers and bridge deck at the Old Carmel River Dam (OCRD). Under the Proponent's Proposed Project, approximately 100 feet of Tularcitos Creek channel will be dewatered for access road construction activities.

Two downstream cofferdams will be installed to isolate the plunge pool from the Carmel River. A pump will lower the water level in the pool and the pool will be filled with crushed rock to support the base of a tower crane. The fill material will be removed once construction activities are complete and the pool will be restored to pre-disturbance condition.

Streamflow from reaches that will be dewatered will be directed into flex pipes that are appropriately sized for each location and the river or stream will be diverted around the construction site. Preconstruction surveys will be conducted for wildlife. Species-specific rescue and relocation programs will be implemented for aquatic species, including amphibians, reptiles,

and fish. Additional details for these programs are described in *Section 5 Species-Specific Measures.*

Tularcitos Access Road Improvements (Proponent's Proposed Project) (WI-6)

Under the Proponent's Proposed Project, construction of the new Tularcitos access route could affect Monterey dusky-footed wood rat, coast horned lizard, pallid bat, California red-legged frog, western pond turtle, two-striped garter snake, yellow warbler and other special-status wildlife species. This activity will not occur under Alternatives 1, 2, 3, and 4.

For the Proponent's Proposed Project, the following measures will be implemented. preconstruction surveys, rescue and relocation operations, predator control, and the development of other measures through consultation based on the results of surveys. Erosion controls, including erosion control fencing, will be implemented to minimize loss of construction material along existing roads that are cut into the slope of the Carmel River canyon, as well as along the plunge pool access road as specified, to reduce impacts from falling debris. These barriers also will keep California horned lizards and western pond turtles out of the construction and traffic corridor. Such barriers will be buried at least 3 to 6 inches in the ground.

Cachagua Access Road Improvements (Alternatives 1, 2, or 3) (WI-9)

Cachagua access road improvements may affect special-status wildlife under Alternatives 1, 2, or 3 (not the Proponent's Proposed Project or Alternative 4). Widening and improving existing access roads could potentially result in minor indirect impacts to Monterey dusky-footed wood rat, pallid bat, and other special-status wildlife species or their habitat. Preconstruction surveys will be implemented and avoidance measures implemented, where practicable. To minimize the potential impact, the left abutment staging area, which already has been disturbed, will be used. To avoid or minimize impacts from falling debris to aquatic species such as California red-legged frogs, foothill yellow-legged frogs, western pond turtles, two-striped garter snakes and fish along the Carmel River, erosion control Best Management Practices (BMP's) will be implemented to protect the Carmel River channels (CAW 2007a,b).

Diversion of Carmel River and San Clemente Creek around San Clemente Reservoir Proponent's Proposed Project, Alternative 1, 2 or 3) (FI-4)

The Carmel River and San Clemente Creek will be diverted around San Clemente Reservoir and the San Clemente Dam site. A sheet pile cutoff wall will collect and divert water from the river and creek into pipes designed to carry up to 50 cfs for the Carmel River and up to 10 cfs for San Clement Creek. The water will be diverted through pipes along both creeks to a location approximately 500 feet downstream of San Clemente Dam, where flow will be returned to the Carmel River.

Upstream of the reservoir, approximately 1,200 feet of the Carmel River and 800 feet of San Clemente Creek will be affected under the Proponent's Proposed Action. Under Alternative 1 or 2, approximately 6,000 feet of the Carmel River and approximately 1,350 feet in San Clemente Creek will be affected. Under Alternative 3, approximately 4,752 feet of the river upstream of the dam and about 1,350 feet in San Clemente Creek will be affected. Under the Proponent's Proposed Action, this activity is scheduled for the construction season of year 2, under

Alternative 1 during years 2 and 3, under Alternative 2 for three construction years, and under Alternative 3 for two years. Therefore protection measures will be implemented during those years.

The intakes of both pipes will be screened consistent with CDFG and NMFS criteria to prevent the entrainment of fish, frogs, and other aquatic organisms. Preconstruction surveys will be conducted for wildlife. Species-specific rescue and relocation programs will be implemented for listed aquatic species, including amphibians, reptiles, and fish. Additional details for these programs are described in *Section 5 Species-Specific Measures.*

Reservoir Sediment Removal (Alternatives 1, 2, or 3) (WI-11)

Under Alternatives 1, 2 or 3 (not the Proponent's Proposed Project or Alternative 4), the reservoir will be drawn down and sediment will be removed from San Clemente Reservoir.

California red-legged frogs and tadpoles, Coast Range newt larvae, and western pond turtle juveniles and hatchlings will be removed from the sediment bed before commencing vegetation removal or sediment excavation, or if individuals are missed in the rescue operation. Prior to any sediment excavation and before California red-legged frogs have been cleared completely from the reservoir bed, vegetation on the sediment bed will be removed with chainsaws and other handheld cutting devices (except "weedwhackers"). After hand clearing of vegetation is completed, the monitoring biologist will resurvey the reservoir bed to determine if any California red-legged frogs or tadpoles remain within the reservoir sediment bed. After ten days pass in which no further California red-legged frogs or tadpoles, Coast Range newt larvae, or western pond turtle juveniles or hatchlings are found in aquatic habitat in the reservoir bed, machine operations including mechanical vegetation removal and sediment excavation will be allowed to commence in the reservoir bed. Additional measures are described in *Section 5 Species-Specific Measures.*

Sediment Transport and Disposal (Alternatives 1 or 2) (WI-12)

Under Alternatives 1 or 2 (not the Proponent's Proposed Project or Alternatives 3 and 4), the proposed sediment disposal site (4R) and conveyor route from the Carmel River canyon to Site 4R may contain habitat for some of the special-status wildlife species. Species most likely to be affected include coast horned lizard, Monterey dusky footed wood rat, and perhaps California tiger salamander or Coast Range newt. Pre-construction surveys of Site 4R and the conveyor route will be conducted by qualified wildlife biologists for these species or their habitat, to assess the likely presence or habitat use by any special-status wildlife species. If listed species habitat or individuals could be harmed, Best Management Plans will be developed to avoid or mitigate damage to special-status wildlife species habitat or individuals.

Bypass Channel Excavation (Alternative 3) (WI-13)

Under Alternative 3, a bypass channel will be constructed. Brushland and riparian habitat clearing and channel excavation will remove some habitat for aquatic species including the California red-legged frog, Coast Range newt and the western pond turtle. These activities may also affect other special-status terrestrial wildlife species, particularly the Monterey dusky-footed

wood rat. Impacts on terrestrial species will be assessed by preconstruction surveys. Special-status species habitat will be flagged.

A California red-legged frog adult and tadpole and western pond turtle juvenile and hatchling relocation program will be conducted to clear the sediment bed of these species prior to vegetation removal, sediment redistribution, channel excavation, and roadway construction. Additional measures are outlined in *Section 2 Species-specific Measures* of this Plan.

5. SPECIES-SPECIFIC MEASURES

Only personnel authorized by the USFWS or NMFS shall handle federally listed species.

5.1. PLANTS

Under the Proponent's Proposed Project and Alternatives 1, 2, and 3, (not Alternative 4), populations of virgate eriastrum and/or Lewis's clarkia potentially may be affected. Both virgate eriastrum and Lewis's clarkia are on List 4 of the CNPS Inventory, and do not fall under specific state or federal regulatory authority. However, to the extent possible, populations of CNPS List 4 species will be avoided during construction activities.

Populations of one special-status species are found near the Tularcitos access route (Proponent's Proposed Project and Alternative 2). Some direct loss of the virgate eriastrum population could occur near the edge of the batch plant footprint. Populations of Lewis's clarkia were found along the existing access road from Cachagua Road and at the sediment disposal site (Alternatives 1 and 2). Alternative 3 may affect populations of Lewis's clarkia along the existing access road from Cachagua Road and at the sediment disposal site. Improvements made to this road for construction access could result in additional impacts to this species.

5.2. CALIFORNIA RED-LEGGED FROG

5.2.1. Survey and Relocation Program

Prior to initiating construction activities, surveys will be conducted for California red-legged frogs in Project-affected areas known to have, or with the potential to have, California red-legged frog. Other special-status aquatic amphibian and reptile species will be surveyed concurrently. Preconstruction and construction surveys will be consistent with the most recent USFWS survey guidance (USFWS 2005).

When California red-legged frogs are observed in the area, the USFWS will be notified, and California red-legged frogs will be captured and relocated by a USFWS-approved biologist to nearby suitable habitat. Suitable river habitats will be identified as potential release sites prior to start of project activities. The survey and relocation program will be modified, if necessary, to be consistent with a mitigation plan to be developed in cooperation with the USFWS and consistent with any terms and conditions required in the Biological Opinion (BO) to be developed as part of during the ESA Section 7 consultation. Any additional terms and conditions that may be part of the USFWS BO for California red-legged frog will be implemented to minimize "incidental take" to the fullest extent practicable.

If bullfrogs are observed, attempts will be made to capture and kill them. This will be done only by a biologist who has extensive experience in differentiating all life stages of bullfrogs from all life stages of native frogs and toads, and who is approved by the USFWS for this purpose.

USFWS-authorized biologists will be present during construction to assist in the implementation of on-site mitigation measures for California red-legged frog and to monitor compliance.

5.2.2. Measures for Specific Activities

Cofferdam Construction and Plunge Pool Dewatering (Proponent's Proposed Project or Alternatives 1, 2, or 3) (WI-3)

The construction of a cofferdam and subsequent draining of the plunge pool could affect any California red-legged frogs that may be present. Under the Proponent's Proposed Project and Alternatives 1, 2, and 3 (not Alternative 4) the following measures will be implemented.

Prior to the construction of the cofferdam and subsequent draining of the plunge pool, a preconstruction survey will be conducted at the plunge pool and downstream to the point at which the bypass pipeline will discharge water into the river. California red-legged frogs observed in the area will be captured and relocated, as described above. Construction fencing will be installed to prevent relocated frogs from returning to the area during the construction period.

A biological monitor will monitor the construction site for the duration of the cofferdam construction and the draining of the plunge pool. The biological monitor for amphibians and reptiles will coordinate with the fisheries biologist so that both are present during fish rescue operations to facilitate the safe removal and relocation of any remaining California red-legged frogs. To reduce the risk for predation on juvenile California red-legged frogs as the plunge pool water levels recede, garter snakes will be captured by a biologist who has a MOU from CDFG to handle special-status reptiles (two-striped garter snake) and released up to one-quarter mile downstream in the Carmel River.

If bullfrogs are observed, attempts will be made to capture and kill them.

Notching Old Carmel River Dam (Proponent's Proposed Project or Alternative 1, 2, 3 or 4) (WI-4)

Under the Proponent's Proposed Project or any of the alternatives, the Old Carmel River Dam will be notched. Prior to dam notching operations, the protocol survey and relocation program described above will be implemented for California red-legged frogs along the Carmel River up to one-half mile downstream of Old Carmel River Dam. Other special-status aquatic amphibian and reptile species will be surveyed concurrently. California red-legged frog populations are known to occur in this reach. If work on the dam is interrupted for more than two weeks, surveys and relocation activities will be repeated if the initial surveys indicated the presence of special-status species habitat or populations.

If other listed species are found, the USFWS will be consulted to institute a take avoidance program.

Concrete Batch Plant Construction and Operation (Proponent's Proposed Project) (WI-5)

Under the Proponent's Proposed Project, a concrete batch plant will be constructed and operated. A preconstruction survey and relocation program for California red-legged frog, as described above, will be implemented in the Carmel River immediately adjacent to the site for the concrete batch plant. The presence of other special-status species will be noted. Erosion control fencing or a similar barrier will minimize movement of frogs back into work areas. A biological monitor will accompany the crew during excavation and installation of the fence to prevent harm to frogs that may be active along the fence route.

Reservoir Drawdown or Elimination without Sediment Removal (Proponent's Proposed Project or Alternative 4) (WI-7) Not Alt 1, Alt 2, Alt 3

Under the Proponent's Proposed Project and Alternative 4 (No Project), the permanent lowering of the San Clemente Reservoir maximum pool will result in a permanent reservoir footprint matching the pool present during existing operations when the flashboard gates are down.

Under these two alternatives, during fish rescue operations, a USFWS-approved biologist will be present to relocate any California red-legged frogs, including subadults and tadpoles. Frogs captured will be removed and either released or relocated according to a predetermined relocation plan. All other native frogs and toads will be released. Any bullfrogs, including tadpoles, encountered during the fish rescue operations will be killed.

A California red-legged frog population monitoring and bullfrog eradication program will be developed and implemented as part of the mitigation plan, in consultation with the USFWS and CDFG as part of the Project permitting process. A program will be undertaken to assess and monitor the relative abundance of bullfrogs and California red-legged frogs in the reservoir and its upper reaches. The program will include a bullfrog eradication program that removes adults, subadults, and egg masses from the reservoir and its upper reaches. This program will be implemented to give the native frog species a "head start" within Project-affected reaches and upstream enhancement/mitigation sites. The bullfrog eradication program will be implemented during the construction and/or drawdown period between July and August. All methods and techniques will be lawful and in accordance with the California Fish and Game Code. Only USFWS-approved biologists will be delegated to identify and destroy egg masses and larval forms of bullfrogs. The program also will include an assessment of bullfrog diet in order to determine the future need for any bullfrog control in the project area and nearby. Concurrent control and monitoring of other non-native predators (e.g., crayfish [*Pacifasticus leniusculus*] and centrarchid fishes) may be included in the program in order to minimize adverse impacts of the Project on California red-legged frogs and other aquatic species. The monitoring and bullfrog eradication program will be implemented for two to three years during Project construction, beginning after USFWS approval of the program and following issuance of a USFWS BO.

Monitoring of California red-legged frog and bullfrog populations will be continued for two years following completion of the Project. If monitoring conducted during and after construction activities indicate that bullfrog populations in enhancement and mitigation sites are increasing and California red-legged frog populations are decreasing, the bullfrog eradication program may

be continued for an additional two years. Annual reports will be submitted to the appropriate regulatory agencies, including but not limited to, USFWS, the Corps, and CDFG.

During several years of past drawdown operations, monitoring of, and adjustments to, enhancement sites has been implemented. As part of the mitigation program, additional California red-legged frog habitat mitigation sites will be restored and monitored. Potential sites will be identified within the Carmel River and potentially in off-stream sites suitable for breeding. Qualified personnel will conduct periodic inspections of California red-legged frog enhancement and mitigation sites to assure that habitat objectives for each site are sufficiently met, i.e., that physical conditions (e.g., basin sediment deposit and overhead vegetation) and bullfrog populations are conducive to California red-legged frog reproduction. Mitigation monitoring will be conducted during two to three years that Project activities are implemented and for an additional two years after, for a total period of at least five years. Implementation and reporting will be concurrent with population monitoring and bullfrog eradication program described above.

As part of the existing Settlement Agreement with USFWS, CAW may be a major party in the preparation of a Habitat Conservation Plan (HCP). This HCP may include population monitoring and bullfrog study and potential control programs. Any future frog population monitoring and bullfrog control programs developed as part of this HCP may supercede the aforementioned frog monitoring and bullfrog eradication program.

Reservoir Drawdown or Elimination and Sediment Removal (Alternatives 1, 2, or 3) (WI-10, WI-11)

Under Alternatives 1, 2 or 3 (not the Proponent's Proposed Project or Alternative 4), reservoir drawdown activities will be implemented and sediment from San Clemente Reservoir will be removed. The following protection measures will be implemented.

A biologist permitted and approved by the USFWS to relocate California red-legged frogs will monitor and oversee all terrestrial wildlife-related activities associated with the drawdown and subsequent activities in the reservoir bed. As the drawdown commences and the reservoir water level declines, the USFWS-approved biologist and crew will rescue California red-legged frogs and tadpoles from the inlet streams and pools in the sediment bed, and relocate them to appropriate aquatic habitat at previously selected secure sites within one mile of San Clemente reservoir. The relocation program will use techniques and procedures specified in the USFWS BO for this project.

This program will commence after April 15, to allow all California red-legged frog eggs to hatch and the tadpoles to grow large enough to be easily identified and differentiated from bullfrog tadpoles. Bullfrogs and bullfrog tadpoles taken during this operation will be killed, and adult bullfrog stomach contents examined to determine if a need exists for bullfrog control at San Clemente Reservoir. Other native wildlife taken incidentally during these operations will be transported to secure habitat (that may be the same sites selected for relocation of California red-legged frogs and tadpoles). This operation will continue throughout the reservoir drawdown, vegetation clearing, and sediment excavation operations; hand vegetation clearing will commence immediately after the drawdown begins.

Prior to any sediment excavation and before California red-legged frogs have been cleared completely from the reservoir bed, vegetation on the sediment bed will be removed with chainsaws and other handheld cutting devices (except "weedwhackers"). Vegetation removed with hand tools will be limited to no lower than 12 inches above grade, to protect California red-legged frogs. Cleared vegetation will be removed from the reservoir bed immediately and taken to an off-site location. After hand clearing is completed, the monitoring biologist will resurvey the reservoir bed to determine if any California red-legged frogs or tadpoles remain within the reservoir sediment bed. After ten days pass in which no further California red-legged frogs or tadpoles, Coast Range newt larvae, or western pond turtle juveniles or hatchlings are found in aquatic habitat in the reservoir bed, machine operations, including mechanical vegetation removal and sediment excavation, will be allowed to commence in the reservoir bed. Grubbing and mechanical stump removal will be performed only after hand clearance is completed and after the monitoring biologist has confirmed that the reservoir sediment bed is free of California red-legged frogs and tadpoles.

After all vegetation is removed, the monitoring biologist will re-survey the reservoir sediment bed a final time to ascertain that California red-legged frog, Coast Range newt larvae, and western pond turtle juveniles and hatchlings are absent from the site. Sediment excavation to the desired level, including all removal, grading and reshaping of the sediment bed, will then commence. If sediment excavation is not accomplished within one season, these procedures will be repeated at the initiation of each construction season to relocate sensitive species that may have re-colonized the reservoir bed.

Bypass Channel Excavation (Alternative 3) (WI-13)

Under Alternative 3, a bypass channel will be constructed. A California red-legged frog adult and tadpole and western pond turtle juvenile and hatchling relocation program will be conducted to clear the sediment bed of these species prior to vegetation removal, sediment redistribution, channel excavation, and roadway construction.

5.3. AQUATIC REPTILES

Cofferdam Construction and Plunge Pool Dewatering (Proponent's Proposed Project, Alternatives 1, 2, or 3) (WI-3)

Under the Proponent's Proposed Project or Alternatives 1, 2, or 3, a cofferdam will be constructed the plunge pool drained. This has the potential to affect any western pond turtles and other special-status species that may be present. Prior to the construction of the cofferdam and subsequent draining of the plunge pool, a preconstruction survey will be conducted for western pond turtle, concurrently with amphibian surveys, at the plunge pool and downstream to the point at which the bypass pipeline will discharge water into the river. If western pond turtles are observed in the area, attempts will be made by a qualified biologist to capture them (trap/net) and relocated them, as directed by CDFG under the MOU for the mitigation plan. Western pond turtles will be relocated to a nearby downstream pond or a pool reach of a stream. Construction fencing will be installed to prevent relocated turtles from returning to the area during the construction period.

A biological monitor will be placed at the construction site for the duration of the cofferdam construction and the draining of the plunge pool. The biological monitor for amphibians and reptiles will coordinate with the fisheries biologist so that both are present during fish rescue operations to facilitate the safe removal and relocation of any remaining turtles.

Two-striped garter snakes and common garter snakes (*Thamnophis sirtalis*) may congregate around the plunge pool as it recedes. These snakes will will be captured by a biologist who has a MOU from CDFG to handle special-status reptiles (two-striped garter snake) and released up to one-quarter mile downstream in the Carmel River.

Reservoir Drawdown or Elimination with Sediment Removal (Alternatives 1, 2, or 3) (WI-10)

Under Alternatives 1, 2 or 3 (not the Proponent's Proposed Project or Alternative 4), reservoir drawdown activities will be implemented. The drawdown has the potential to isolate western pond turtles and impact juveniles.

As the drawdown commences and the reservoir water level declines, qualified biologists will rescue western pond turtle juveniles and hatchlings from the inlet streams and pools in the sediment bed, and relocate them to appropriate aquatic habitat at previously selected secure sites within one mile of San Clemente reservoir. Other native wildlife taken incidentally during these operations will be transported to secure habitat (that may be the same sites selected for relocation of California red-legged frogs and tadpoles and western pond turtle juveniles and hatchlings). This operation will continue throughout the reservoir drawdown, vegetation clearing, and sediment excavation operations; hand vegetation clearing will commence immediately after the drawdown begins.

Bypass Channel Excavation (Alternative 3) (WI-13)

Under Alternative 3, a bypass channel will be constructed. A western pond turtle juvenile and hatchling relocation program will be conducted to clear the sediment bed of these species prior to vegetation removal, sediment redistribution, channel excavation, and roadway construction.

5.4. CALIFORNIA HORNED LIZARD

Concrete Batch Plant Construction and Operation (Proponent's Proposed Project) (WI-5)

Under the Proponent's Proposed Project (not other alternatives), construction of the batch plant and associated facilities may temporarily impact available habitat for California horned lizard. Although lizards were not observed during field surveys, suitable open habitat for these lizards may occur along the Carmel River, and MPWMD staff have reported seeing lizards on existing roads in the vicinity of the proposed batch plant.

A preconstruction survey will be conducted for California horned lizards and results will be reported to CDFG. If horned lizards are found, protection measures will be implemented, including relocating horned lizards to a safe area outside of the area and installing erosion control fencing or a similar barrier to minimize movement of horned lizards back into work areas. The barrier will be buried at least 3 to 6 inches in the ground. Mesh size will not exceed one-half inch and material will be heavy gauge polybutylene or equivalent. A qualified

biological monitor will accompany the crew during excavation and installation of the fence to prevent harm to horned lizards that may be active along the fence route.

Tularcitos Access Road Improvements (Proponent's Proposed Project) (WI-6)

Under the Proponent's Proposed Project, Tularcitos access road improvements will be implemented. Damage to coast horned lizards could occur from grading operations. Protection measures for coast horned lizards or other special-status wildlife found in the area will include preconstruction surveys, rescue and relocation operations, predator control, and the development of other measures through consultation, based on the results of preconstruction surveys. Erosion control fencing will be installed, which will keep California horned lizards out of the construction and traffic corridor.

5.5. BATS

In locations within the Project area where potential nesting or roosting habitat for special-status bat species (pallid bat, California mastiff bat, and/or Townsend's big-eared bat) occurs, a preconstruction survey will be conducted. Surveys will be conducted by a biologist with expertise in bat biology. Visual survey techniques and acoustic monitoring equipment will be used to determine whether bats are likely to use any of these structures. If evidence of bat use is discovered, roost sites will be mapped by GPS and flagged in the field. Construction will be routed to avoid roost sites.

If special-status bat species are observed, CDFG will be notified and mitigation measures previously agreed upon with the agency may be implemented. Additional measures will be implemented at any roost site that cannot be avoided. Such measures may include establishment of buffer zones or installation of exclusion barriers under the supervision of a qualified bat biologist.

Dam Strengthening (Proponent's Proposed Project) (WI-1)

Under the Proponent's Proposed Project, dam strengthening activities have the potential to disrupt bat nesting habitat. Potential nesting or roosting habitat for bats occurs in rock crevices on the slope where the new right abutment wall will be constructed. A preconstruction survey will be conducted for bat roosts in rock crevices in the right embankment area. If bats are observed nesting or roosting in the area, CDFG will be notified and mitigation measures will be implemented, such as establishment of buffer zones or installation of exclusion barriers.

Tularcitos Access Road Improvements (Proponent's Proposed Project) (WI-6)

Under the Proponent's Proposed Project, Tularcitos access road improvement activities have the potential to affect pallid bats. Damage to potential pallid bat roosting habitat may result from the destruction of rock outcrops and other formations. Pre-construction surveys of rock outcrops and other formations along the Tularcitos route will implemented to see if pallid bat roosts are present. If evidence of pallid bat use is discovered, roost sites will be mapped by GPS and flagged in the field. Construction will be routed to avoid roost sites. Additional measures will be implemented at any roost site that cannot be avoided, such as establishment of buffer zones or installation of exclusion barriers.

Removal of Ancillary Facilities (Alternatives 1, 2, or 3) (WI-2) Not PP, Alt 4

Under Alternatives 1, 2 or 3 (not Proponent's Proposed Project or Alternative 4), removing the valve house from atop San Clemente Dam and removing other anthropogenic structures from near the dam may displace special-status bat species from traditional roosts. Unidentified species of bats use the valve house and other nearby buildings as day roosts. Removing those structures could displace roosting bats and may increase mortality if the structures are removed when newborn or very young bats are present in the roosting colonies.

Surveys will be conducted to determine whether bats are likely to use any of these structures. If evidence of bat use is discovered, roost sites will be mapped by GPS and flagged. Construction will be routed to avoid roost sites. Additional measures will be implemented at any roost site that cannot be avoided, such as establishment of buffer zones or installation of exclusion barriers. If possible, structure removal will be scheduled after juvenile bats are weaned and capable of flight, as determined by a biologist with expertise in bat biology.

Cachagua Access Road Improvements (Alternatives 1, 2, or 3) (WI-9)

Cachagua access road improvements may affect special-status wildlife under Alternatives 1, 2, and 3, but not under the Proponent's Proposed Project or Alternative 4. Widening and improving existing access roads could potentially result in minor indirect impacts to pallid bat and other special-status wildlife species. So long as the low pipeline access road will not be used, rock crevices and cavities that may provide day and/or night roost sites for pallid bats will not be affected. Pre-construction surveys of rock outcrops and other formations along the access route will be conducted. If evidence of pallid bat use is discovered, roost sites will be mapped by GPS and flagged in the field. Construction will be routed to avoid roost sites.

5.6. BIRDS

Under the Proponent's Proposed Project, or Alternatives 1, 2, or 3 (not Alternative 4), vegetation removal and other construction-related disturbance have the potential to affect nesting birds. Under the Proponent's Proposed Project, Tularcitos access road improvement activities also have the potential to affect nesting birds.

Potential impacts to special-status birds from vegetation removal and other construction activities include potential disturbance to breeding individuals during the nesting season, particularly if nests occur in or adjacent to the construction sites. Possible impacts to breeding birds will depend on a number of variables, including species affected, nest location, topographical shielding, breeding phenology, and type of construction activity.

Tree removal will be restricted to the minimum number of trees necessary to allow access by construction vehicles. To the extent possible with other construction constraints, vegetation removal will be accomplished between August 1 and March 1. If any vegetation removal must be conducted between March 1 and August 1, pre-construction surveys for breeding birds (either special-status or others protected by the Migratory Bird Treaty Act and the California Migratory Bird Act) will be conducted in these areas. If any active nests are found, they will be isolated by a species-specific buffer area (from 50 to 500 feet) and avoided until the eggs are hatched and the nestlings fledged.

Concrete Batch Plant Construction and Operation (Proponent's Proposed Project) (WI-5)

Under the Proponent's Proposed Project, a concrete batch plant will be operated and constructed. The proposed batch plant is more than 2,000 feet from a known, active, Cooper's hawk nest and yellow warbler nesting area. However, increased construction vehicle traffic from the batch plant to the dam site could cause increased noise and dust.

A preconstruction survey will be conducted to determine if the documented Cooper's hawk nest is active at the onset of construction. If the nest is active, this will be reported to CDFG and a noise abatement program will be implemented for passing vehicles. The program will include standard mitigation measures, such as prohibiting the use of air horns or jake (engine) brakes. Construction vehicles will be prohibited from parking near the CVFP and traffic will be directed as far away from the nest as practical. Gravel or crushed rock will be placed to buffer noise and minimize dust generation in vicinity of nest (see Botanical Resources Management Plan for dust abatement measures). Existing native vegetation will be maintained between the nest and the existing road corridor, including the large valley oak tree west of Settling Pond Number 1.

5.7. MONTEREY DUSKY-FOOTED WOOD RAT

Tularcitos Access Road Improvements (WI-6, WI-9)

Under the Proponent's Proposed Project, construction of the new Tularcitos access route has the potential to damage or destroy a known Monterey dusky-footed wood rat nest located near Tularcitos Creek.

Cachagua access road improvements may affect special-status wildlife under Alternatives 1, 2, and 3 (not under the Proponent's Proposed Project or Alternative 4). Widening and improving existing access roads could potentially result in minor indirect impacts to Monterey dusky-footed wood rat. Use of the Center Court Drive access road will reduce impacts affecting known Monterey dusky-footed wood rat nest located near Tularcitos Creek, but may indirectly impact a nest observed above the road in July 1998. Widening of the existing access roads may disturb trees that provide nesting structures for Monterey dusky-footed wood rats.

GPS data will be used to indicate the location of the existing Monterey dusky-footed wood rat nest(s) relative to the proposed route on project construction maps. A preconstruction survey will be conducted for Monterey dusky-footed wood rats and their nests in areas of any proposed route or proposed access road widening or improvement. If wood rat nests are found, they will be reported to CDFG and flagged for avoidance, and construction routes and activities will be planned to avoid the nests. Stakes, flags or plastic tape will be used to enforce avoidance. If any wood rat nests are found that cannot be avoided, trapping and relocation of the wood rat(s) upstream or to a suitable adjacent stream nearby will be implemented according to CDFG requirements.

Tree removal will be restricted to the minimum number of trees necessary to allow access by construction vehicles (also see Botanical Resources Management Plan).

5.8. STEELHEAD

Water Quality Protection Measures (Proponent's Proposed Project, Alternatives 1, 2, 3, or 4) (F-6)

Construction activities on stream crossings, bridges, and adjacent roads have the potential to result in sedimentation and turbidity in streams. Reservoir drawdown and river diversion activities have the potential to affect turbidity, temperature and dissolved oxygen levels in the Carmel River downstream of San Clemente Dam.

Activities in Streams and on Roads

Erosion control measures will be implemented to protect water quality in any Project-affected waterways during construction as described in the SWPPP (CAW 2007a) and Botanical Resources Plan (CAW 2007b). An erosion control and road drainage plan (Section 4.1 of EIR) will be implemented. Stream margins will be revegetated when construction work is completed (see Botanical Resources Management Plan (CAW 2007b).

Activities in the Reservoir

During reservoir drawdown, all inflow will be allowed to flow through the reservoir and turbidity control will be managed by moderating the rate of drawdown. The rate of drawdown will be limited to 0.05 foot per day, consistent with the NMFS BO for drawdown activities. During construction drawdown, all or most of the inflow to the reservoir from the Carmel River and San Clemente Creek will be piped around the reservoir. This will provide an option to regulate water releases from the reservoir into the river, if needed. If the last few acre-feet of water become highly turbid, the reservoir may be lowered by the use of well points. This will avoid releasing turbid, warm, surface water directly into the river.

Sediment dewatering will occur after the reservoir has been emptied. Water from well points in the reservoir will be treated to reduce turbidity and temperature, and increase dissolved oxygen levels prior to release downstream. The water will be aerated and cooled prior to release into the river.

Reservoir drawdown will be timed to occur when water temperature loading is not critical. Reservoir drawdown and pumping of water from the plunge pool at the base of San Clemente Dam will be occur early in the year, prior to the warmest summer period when high temperatures occur in the area. As the water level is lowered and surface water temperatures rise during the day, drawdown will switch from a surface release to release through well points. Surface releases will be restricted to night or early morning periods.

Diversion pipes around the reservoir will be sited in locations that favor shade, or pipes will be buried beneath a shallow layer of sand. Where the pipe is exposed to full sun and it is not possible to bury it, the pipe will be painted white to reflect light.

Water quality will be monitored in the reservoir during drawdown, as required in the NMFS BO for drawdown activities. The dissolved oxygen criteria will be consistent with the BO, at 5.0 mg/L. Water will be aerated either as it leaves the diversion pipes or with a mechanical aerator

prior to release in the river. Low dissolved oxygen in reservoir water is quickly moderated when water falls over the dam.

Dewatering the Plunge Pool
Turbidity due to dewatering the plunge pool at the base of San Clemente Dam will be regulated by the rate at which the plunge pool is pumped down. If needed, the water will be treated prior to release into the river, similar to treatment of water from the reservoir.

Dewatering the plunge pool will occur after reservoir dewatering.

5.8.1. Fish Rescue and Relocation Program

Portions of the Carmel River and its tributaries will be dewatered for construction activities. A fish rescue and relocation program will be implemented for fish in affected reaches, including Steelhead.

A fish rescue will be implemented prior to the complete diversion of water from any stream channel. NMFS-approved biologists will conduct rescue and relocation efforts for steelhead. The stream channel to be dewatered will be isolated with nets. Any fish in the area will be captured, removed, and relocated to other suitable areas of the Carmel River. Fish will be rescued using block nets, seines, dip nets, and backpack electrofishing. Electrofishing will follow guidelines established by NMFS (2000).

5.8.2. Measures for Specific Activities

Channel Dewatering (Proponent's Proposed Project, Alternative 1, 2 or 3) (FI-1, FI-2)

The plunge pool and up to about 400 feet of Carmel River channel downstream the San Clemente Dam will be dewatered. Under the Proponent's Proposed Project, the Carmel River will not be dewatered to upgrade the piers and bridge deck at the OCRD.

A fish rescue and relocation program will be will be implemented prior to the complete diversion of water from these stream channels and the plunge pool, as described above.

Access Route Improvements (Proponent's Proposed Project, Alternative 1, 2 or 3) (FI-1)

Road improvements along the Carmel River between the Sleepy Hollow Ford and OCRD have the potential to result in sedimentation and increased turbidity along about a mile of the Carmel River from OCRD downstream to the Sleepy Hollow Ford during the construction season. Erosion control measures will be implemented to protect water quality in Project-affected waterways during construction as described in the SWPPP (CAW 2007a) and Botanical Resources Plan (CAW 2007b). An erosion control and road drainage plan (Section 4.1 of EIR) will be implemented. Stream margins will be revegetated when construction work is completed (see Botanical Resources Management Plan (CAW 2007b).

During construction of the road from OCRD to San Clemente Dam, tree removal will be minimized to the extent practical. Tree removal will be limited to only those limbs or trees that

require cutting to provide clear access along the Carmel River between Sleepy Hollow Ford and the OCRD.

Road fill will be needed to raise the access road above frequent flood elevations. The fill will be placed on a fabric or rubber liner on the floodplain. Riprap or boulders that are too large for the river to move during floods will be used to face the road fill. The boulder covering, road-fill and fabric of the rubber liner will be removed after access to the base of the dam is no longer needed.

Diversion of Carmel River and San Clemente Creek around San Clemente Reservoir (FI-4) and Reservoir Drawdown (Proponent's Proposed Project, Alternative 1 2 or 3) (FI-5)

The Carmel River and San Clemente Creek will be diverted around San Clemente Reservoir and the San Clemente Dam site. Water will be diverted through pipes along both creeks to a location approximately 500 feet downstream of San Clemente Dam. The intakes of both pipes will be screened according to CDFG and NMFS criteria to prevent the entrainment of fish, frogs, and other aquatic organisms.

Fish traps will be installed upstream of diversion points to capture downstream migrating fish prior to reservoir drawdown. Fish will be transported around the diversion reach and released into the Carmel River.

A fish rescue and relocation program will be implemented in the diverted channels between the diversion points in the Carmel River and San Clemente Creek and the reservoir. Some diversion of water will occur to reduce the flow in the channels to be rescued. Block nets will be installed to prevent fish from moving from the reservoir into the stream. Drawdown of the reservoir will begin after all fish are rescued from the channels.

A fish rescue will be implemented in the reservoir during drawdown. Rescued fish will be relocated to other suitable habitat downstream of San Clemente Dam in the Carmel River.

Under the Proponent's Proposed Project, the reservoir water level will be lowered to 510 feet above mean sea level (MSL). Sheet piles will be installed in the reservoir around an inoperable mid-level intake gate located 31 feet below the spillway. The area between the dam and sheet piles will be excavated and the intake gate will be repaired. The intake will be moved to a location in the proximity of the sluice gate. The water level will be lowered to the bottom of the reservoir after the intake gate is repaired. During reservoir drawdown, a temporary fish screen, meeting NMFS and CDFG criteria, will be installed around the repaired intake gate.

Under Alternative 1, the reservoir water level will be lowered to 504 feet, which will completely dewater the reservoir. If lower storage in the reservoir during the spring months affects Steelhead upstream passage, a trap and truck operation will be implemented. Fish rescues will be implemented for two consecutive years. Fish traps operated at the inflowing channels to the reservoir will mitigate downstream passage.

Stream Sediment Removal, Storage, and Associated Restoration (Alternative 1) (FI-14)

Under Alternative 1, approximately 4,752 feet of channel in the Carmel River and about 1,350 feet in San Clemente Creek will be eliminated during the two years it will take to remove

sediment from the reservoir and notch the dam. The channels will be flooded during the winter between construction seasons of years 2 and 3.

During the construction season of year 3, geomorphically appropriate channels will be reconstructed and revegetated. The Carmel River and San Clemente Creek channels will be reconstructed through the excavated sediments. The channels will be rebuilt with gravel, cobble and boulder materials salvaged during sediment removal. Channels will be geomorphically appropriate to the new valley gradient and substrate sizes. The channels will be revegetated with native trees and shrubs. Approximately 6,500 feet of channel will be constructed in the Carmel River and about 1,350 feet in San Clemente Creek.

Stream Sediment Removal, Storage and Associated Restoration (Alternative 2)

Under Alternative 2, the dam and most of the sediment behind it will be removed. The reservoir will be excavated down to 480 to 500 feet in elevation in the construction season of year 3 and in year 4 to the original bed of the river, around elevation 460 feet. At the end of the construction season of year 3, the reservoir will fill with approximately 1,000 acre-feet (AF) of water before it will spill.

Fish rescues will be implemented during the three consecutive years of construction. To mitigation for operation of a 500 AF and 1,000 AF reservoir in construction years 3 and 4, respectively, upstream passage will be maintained through the fish ladder or via the trap and truck operation. Fish traps operated at the inflowing channels to the reservoir will mitigate downstream passage.

The Carmel River and San Clemente Creek will be completely rebuilt with gravel, cobble, and boulder materials salvaged during sediment removal. Channels will be restored based upon an understanding of their historic conditions. Restoration of the channels will be based upon the uncovered topography and a geomorphic understanding of appropriate channel dimensions, considering substrate size, gradient, and valley width. The restored channel length will be similar to the channel lengths that existed prior to the construction of San Clemente Dam. The restoration will restore about 5,000 feet of Carmel River channel and about 2,2000 feet of San Clemente Creek channel. Riparian zones along the restored channels will be revegetated with native trees and shrubs (CAW 2007b).

Stream Sediment Removal, Storage and Associated Restoration (Alternative 3)

Sediments will be dewatered to near the original elevation of the bed of the river to allow for complete sediment removal in the San Clemente Creek arm of the reservoir and the Carmel River immediately upstream of the dam. The trap and truck operation will be implemented to maintain upstream fish passage.

Rock material from the diversion channel cut through the ridge separating the Carmel River from San Clemente Creek will be used to construct a cutoff wall across the Carmel River arm upstream of the diversion channel. Sediment will be excavated from about 800 feet of the existing San Clemente Creek channel.

Approximately 2,200 feet of the San Clemente Creek will be reconstructed to carry Carmel River flows, including about 850 feet of channel currently under the reservoir in the San Clemente arm. A new channel for the Carmel River will be constructed through the diversion bypass channel between the Carmel River and San Clemente Creek, and down the San Clemente Creek arm. The new configuration will include about 300 feet of constructed channel through the bypass and about 2,200 feet of newly constructed channel in the existing San Clemente Creek arm.

Channel restoration activities will include excavation and placement of gravel, cobble, and boulder materials salvaged during sediment removal. The new Carmel River channel will be geomorphically designed based upon flow capacity requirements, gradient, and valley width of the Carmel River. Habitat in restored channels will be revegetated with native trees and shrubs (CAW 2007b).

Sluicing, Dredging or Sediment Transport (Alternative 2 or 3)

Alternative 1 or 2 will remove the dam and most of the sediment behind it. Sedimentation may occur after dam removal in the winter following construction year 4. Erosion control and revegetation actions will be implemented in the reservoir zone during construction year 4 as the dam is being demolished. The channels through the former reservoir site will be restored to a geomorphically correct form.

Reservoir Drawdown (Alternative 4)

Reservoir drawdown will continue as an interim method to provide dam safety until the reservoir is filled with sediment. Drawdown will occur after June 15 and the reservoir will be drawn down to about 515 feet in elevation.

During drawdown, water quality will be protected as described in *Section 5.8.1. Water Quality Protection Measures* for activities in the reservoir.

A fish rescue and relocation program will be implemented in the reservoir during drawdown. Fish trapping and rescues will be implemented upstream of the reservoir for downstream migrating fish. Rescued fish will be relocated to suitable habitat in the Carmel River.

Trap and Truck at Old Carmel River Dam (Proponent's Proposed Project, Alternative 1, 2 or 3) (FI-3, FI-7)

A trap and truck facility will be operated to mitigate for the closure of San Clemente Dam to upstream fish passage during the construction phase of the Proponent's Proposed Project, or Alternatives 1, 2, or 3. The trap and truck facility will be located at the OCRD and will be operated whenever upstream migration is impaired at San Clemente Dam.

The fish ladder will be closed for a period of days to weeks, toward the end of the migration season during the construction season. The trap and truck facility will be constructed one year prior to reservoir drawdown and be operated to provide upstream migration during the drawdown.

The design of the facility will employ the most recent developments in fish passage design and the safe handling of fish to reduce the potential for injury and disease, and to minimize stress. The facility will be located at the OCRD and be operated whenever Steelhead upstream migration will be impaired at San Clemente Dam. Fish will be attracted into a ladder leading to a holding facility by redirecting flows from the river upstream of the OCRD into the ladder. Steelhead entering the ladder will move upstream to a holding facility. Both the ladder and holding facility will be supplied by water from the river upstream. Fish entering the facility will be trapped and held up to 24 hours. Trapped fish will be transported by truck to an upstream release sit in the Carmel River or San Clemente Creek. It is estimated that the transfer trip could take up to one hour.

Operators will closely track stream, holding facility, transport, and release water temperatures Injuries to fish and possible causes will be documented. Problems with trap and truck facilities will be quickly identified and addressed. If mortality rates exceed upper levels mandated by NMFS and CDFG, operations will be suspended until problems are identified solutions are established. A decision process will be developed during the permitting process to determine if and when the facility should be closed and fish left in the river to spawn below the Project area.

Fish Ladder Repair and Sluicing Operations (Proponent's Proposed Project) (FI-8, FI-9)

Under the Proposed Project, the existing fish ladder will be demolished and replace by a new, vertical slot ladder. All flows less than about 55 cfs will be conveyed through the ladder and not over the spillway. During times that the dam spills, the ladder will carry about 77 cfs.

A sluice gate will be installed near the ladder entrance to maintain passage conditions upstream of the ladder and to keep the ladder free of sediment. Details of the size, location and orientation of the sluice gate are provided in MEI (2006a). Sluicing operations and maintenance are defined in the Sluicing Operations and Maintenance Plan (CAW 2007c).

Sluicing will occur as needed to maintain the upstream river channel for adult fish passage and will only occur when certain flow conditions are met. A gate will be installed on the upstream end of the ladder to prevent fish from moving out of the ladder before and during sluice gate operation. The fish ladder exit will be closed about 2 to 4 hours before sluicing begins. Sluicing will occur consistent with the operations and management plan, then the sluice gate will be closed and the ladder reopened. Adequate fish passage conditions are defined as a minimum of one foot of water depth in the channel upstream of San Clemente Dam. Sluicing operations will begin with short-duration sluices and impacts will be thoroughly evaluated to determine effects on downstream channels, habitat and fishes.

Excavation or Dredging of Sediment for Fish Passage (Proponent's Proposed Project) (FI-10)

When sluicing sediment is not possible because of potential downstream impacts, mechanical sediment removal will be performed to maintain fish passage upstream of the fish ladder. Sediment will be removed with an excavator or a suction dredge. Sediment will be physically excavated during low flow conditions from upstream of the ladder. This activity will not occur during periods of peak Steelhead migration.

During dredging or excavation, flow through the fish ladder will be minimized and the upstream end of the ladder will be closed to prevent fish that are leaving the ladder from entering the excavation area. Flow into the ladder will be reduced to minimize suspended sediment from entering ladder flow. Recently deposited fine grained substrates impeding fish passage will be removed from the area upstream of the ladder and hauled and stored in the aggregate storage site.

Fish Ladder Replacement (Alternative 1 or 3)

The existing ladder will be replaced by a new, shorter vertical slot ladder.

Ongoing, as-needed, inspection of the river channel upstream of the fish ladder will be implemented to determine if adequate channel depths exist. As data accumulate, the frequency of inspection may be adjusted to the interval necessary to assure that sediment accumulation does not become problematic for fish passage.

A Sluicing Operation and Maintenance Plan will be implemented to maintain the upstream river channel for fish passage. The fish ladder exit will be closed during sluicing and/or dredging activities to protect fish.

Downstream Fish Passage at San Clemente Dam (Proponent's Proposed Project) (F-13)

The spillway will be modified by raising the elevation of the two lateral spillway bays by 0.5 feet relative to the center. Spillways will be extended to directly spill into the plunge pool and not strike the thickened dam face.

During low flows, all surface flow will be carried through the fish ladder (up to 55 cfs.). At flows higher than 55 cfs, surface flow will begin to spill through the center spillway bay. For flows in the range of approximately 55 to 115 cfs, most of the flow (55 to 62 cfs) will pass through the ladder and the remaining flow will spill over the lower, center spillway (elevation 525.0). Above streamflows of approximately 115 cfs, spill will also occur at the two higher spillway segments (elevation 525.5 feet). The ladder will continue to operate during higher flows and will be designed to carry up to about 77 cfs when river flow volume is about 700 to 800 cfs or higher.

This configuration provides an increased depth of flow during lower flows, compared to the existing spillway and ladder configuration. The new spillway bays will be equivalent to, or better than, the existing spillway bays for fish passage. The fish ladder will pass all flows up to about 55 cfs, reducing the amount of time the reservoir spills and will provide safer passage down the ladder.

Downstream Fish Passage at San Clemente Dam (Alternative 1)

Under Alternative 1, the dam will be lowered by 21 feet and the height of the fall for fish will be reduced from about 65 feet to 44 feet. This will benefit downstream fish passage. A notch will be cut in the dam at an elevation at the dam thickening point. The low flow channel will be created within the notched dam spillway to provide increase depth of flow depth. A new, shorter ladder will pass all flows downstream at flows up to 60 cfs.

Downstream Fish Passage at San Clemente Dam (Alternative 3)

The dam will be lowered by 21 feet and the height of the fall will be reduced from about 65 feet to 44 feet. A low flow channel will be created within the notched dam spillway to provide increased depth. The new, shorter ladder will pass all flows downstream at flows up to 60 cfs.

Fish Screen Installation at San Clemente Dam Intake (Proponent's Proposed Project, Alternative 1, 2 or 3) (FI-ll)

A new fish screen meeting NMFS and CDFG criteria will be installed at the intake for the new CAW water diversion point, at the head of the San Clemente Reservoir, to eliminate entrainment into the diversion and minimize impingement.

Notching Old Carmel River Dam (Proponent's Proposed Project, Alternative 1, 2, 3 or 4) (FI-15)

The OCRD will be notched during the construction season of year 2 under the Proponent's Proposed Project, in year 3 under Alternative 1, or year 4 under Alternative 2. A large center section of the dam will be removed, leaving only the north and south abutments. The OCRD will no longer be a passage barrier.

Construction activities will occur for several weeks, up to a month, during the Steelhead rearing season in construction year 2. The plunge pool downstream of the OCRD will be dewatered and the river diverted around the site prior to construction activities. A portion of the channel upstream will be dewatered.

A fish rescue and relocation operation will be implemented in the plunge pool and dewatered stream channel, as described above. Rescued fish will be relocated to suitable habitat in the Carmel River.

When dam notching activities are complete, the channel upstream will be recontoured based on the expected geomorphic condition for the notched dam. Access roads will be removed and the new channel banks revegetated.

Sleepy Hollow Steelhead Rearing Facility (Proponent's Proposed Project, Alternative 1, 2, 3 or 4) (FI-16)

During construction periods, road construction, dewatering the plunge pool at the San Clemente Dam, diverting water around the reservoir, and reservoir drawdown have the potential to affect water quality at the Sleepy Hollow Steelhead Rearing Facility (SHSRF). Sediment delivered to the river below San Clemente Dam from sluicing or from sediment transported over the dam also may affect the SHSRF.

An alternative water supply will be made available to the SHSRF. Water may be pumped up from the Russell Wells and be made available to the SHSRF during construction years or during periods of excessive turbidity or sediment levels in the Carmel River.

Relocate CAW Water Diversion Upstream (Alternatives 1, 2, or 3) (FI-11)

Under the alternatives, the water supply diversion intake will be relocated from the current dam site to 6,000 feet upstream on Carmel River. An Operations Plan will be developed in conjunction with NMFS, CDFG, SWRCB, and the MPWMD that will provide flows for Steelhead habitat in this reach.

REFERENCES

California American Water Company (CAW). 2007a. Storm Water Pollution Prevention Plan. Prepared by ENTRIX, Inc. Prepared for California American Water Company.

CAW. 2007b. Botanical Resources Management Plan. Prepared by ENTRIX, Inc. Prepared for California American Water Company.

CAW. 2007c. Sluicing Operations and Maintenance Plan. Prepared by ENTRIX, Inc. Prepared for California American Water Company.

Yadon, V. A botanical report for six areas designated for possible alteration or disturbance in selecting a receiver site for sediment from behind the San Clemente Dam. Prepared for ENTRIX, Inc. Seattle, Washington.

Appendix W

WETLAND DELINEATION

FINAL

SAN CLEMENTE DAM SEISMIC SAFETY EIR/EIS
PROJECT WETLAND DELINEATION

Prepared for:
CALIFORNIA-AMERICA WATER COMPANY
Monterey, CA

For Submittal to:

UNITED STATES ARMY CORPS OF ENGINEERS
San Francisco, CA

Prepared by:

ENTRIX, INC.
Walnut Creek, CA

Project No. 3018605

January, 2008

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1.1 PROJECT BACKGROUND

The California American Water Company (CAW) proposes to implement the San Clemente Dam Seismic Safety Project to increase dam safety to meet current standards for withstanding a Maximum Credible Earthquake and passing the Probable Maximum Flood at the dam. The purposes and objectives for the project are to: 1) meet current standards for withstanding a MCE and PMF at the San Clemente Dam, 2) provide fish passage at the dam, maintain a point of diversion to support existing water supply facilities, water rights and services, and minimize financial impacts to California-American Water rate payers.

The Project area and various alternatives encompass the San Clemente Reservoir and portions of the Carmel River, San Clemente Creek, Tularcitos Creek, and an unnamed drainage. These areas include both potential jurisdictional wetlands and other waters of the U.S. Therefore, the San Clemente Dam Seismic Safety Project will require a permit from the Army Corps of Engineers (Corps) prior to starting the work.

1.2 PROJECT LOCATION

The Project area is located along the Carmel River and several tributaries within Monterey County, California (Figure 1-1), including San Clemente Creek and Tularcitos Creek. The site is bounded by on the north by Carmel Valley Road and the Sleepy Hollow residential community on San Clemente Drive. Most of the land in the Project area and its vicinity is owned by CAW.

A set of figures depicting areas in which project-related activities intersect with potential jurisdictional waters of the U.S. is provided in Appendix A.

1.3 PROJECT DESCRIPTION

Construction is proposed at the project site in order to strengthen the existing dam to meet current safety standards. Prior to construction, access roads will be constructed or improved and staging areas will be cleared in the within the Project area. The proposed Project and one alternative would require the construction of a new crossing of Tularcitos Creek to reach the Project area directly from Carmel Valley Road without passing through the Sleepy Hollow community.

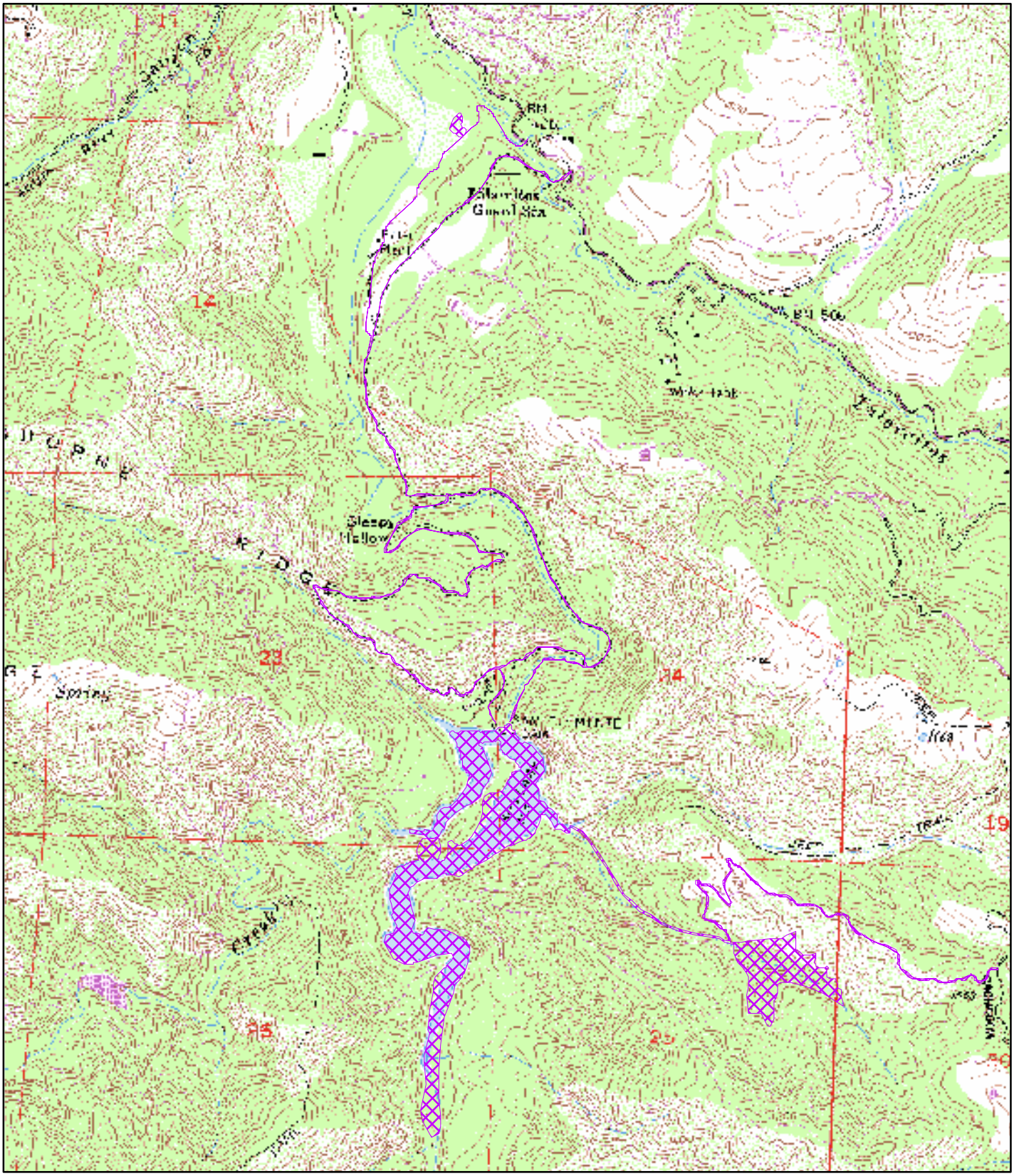


Figure 1-1
Project Area and Alternatives
San Clemente Dam
Seismic Retrofit EIR/EIS Project

ENTRIX

1.4 PURPOSE OF REPORT

The Corps has permit authorization over activities taking places in wetlands. Under the permit process, applicants are required to provide a wetland delineation of the project site as part of their permit application to the Corps. The purpose of this report is to present the results of an assessment of 1) the potential occurrence of jurisdictional wetlands at the project site and 2) the extent of other waters of the U.S. at the project site that may be under the jurisdiction of the Corps, pursuant to its authority under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

The Project area includes relatively level floodplain areas and steep hillsides. The confluence of San Clemente Creek with the Carmel River is just upstream of the dam. The project site is primarily on wildlands, but some alternatives include access through a residential community at the Carmel Valley Road.

2.1 CLIMATE

Climatological information presented in the Soil Survey of Monterey County, California (USDA 1978) indicates that the area is characterized by a generally mild climate. Temperatures near the coast are uniform, but inland locations have summers that range from warm to hot. Winter temperatures inland may be below freezing. The average annual minimum temperature is 44.1 F, and the average annual maximum temperature is 70.7°F (WRCC 2005). The growing season in cultivated areas of Monterey County ranges from 200 to 350 days (USDA 1978). The average annual precipitation in the vicinity of the project is 17.4 inches in the valley (WRCC 2005). Most precipitation falls in winter.

2.2 VEGETATION

Based on literature review and field surveys, fifteen plant communities (habitat types) dominated primarily by native species were identified in the project vicinity. Six of these communities are riparian, four communities are upland forest or woodland types, and three communities are upland shrub-dominated types. The remaining two native plant communities are herbaceous. A number of sites within the Project area were mapped as intermediate between two recognized community types. Generally, these communities correspond to Sawyer and Keeler-Wolf's vegetation series (Sawyer & Keeler-Wolf 1995). Mixed stands may be described by Holland's vegetation classifications (Holland 1986), and these classifications have also been provided where they correlate with the series categories.

In addition to the native plant communities, sites that are classified as developed or disturbed/ruderal occur in the Project area. On these sites, human activity controls the vegetation present. The species of vegetation at these sites vary greatly, depending on micro-habitat conditions and disturbance and planting history. These sites are typically dominated by an assortment of weedy, mostly non-native annual and perennial grasses and herbs, unless they are occupied by developed facilities or landscaping.

The upland vegetation types present in the Project area and their dominant species are presented below. Brief descriptions of the riparian and wetland vegetation types occurring within the Project area follow.

UPLAND VEGETATION

Upland vegetation types in the Project area include Coast Live Oak Series (Coast Live Oak Forest) dominated by coast live oak, California Bay Series (California Bay Forest) dominated by California bay, Blue Oak Series (Blue Oak Woodland) dominated by blue oak (*Quercus douglasii*), a very small stand of Redwood Series (Upland Redwood Forest) dominated by coast redwood (*Sequoia sempervirens*), California Sagebrush Series, dominated by California sagebrush (*Artemisia californica*), Black Sage Series dominated by black sage (*Salvia mellifera*), California Sagebrush-Black Sage Series dominated by California sagebrush and black sage, Chamise Series dominated by chamise (*Adenostoma fasciculatum*), Chamise-black sage series dominated by black sage and chamise, Mock-Heather Scrub dominated by mock-heather (*Ericameria ericoides*), California Annual Grassland Series (Non-Native Grassland) dominated by non-native annual grasses and native and non-native herbs.

RIPARIAN VEGETATION

Riparian vegetation in the project area and vicinity includes one herbaceous type, two scrub types, and four forest types. Of these, the two scrub types, Narrowleaf Willow Series (Central Coast Riparian Scrub) and Mulefat Series (Mulefat Scrub), do not occur in the wetland delineation sites. These types are dominated by narrow-leaved willow (*Salix exigua*) and mulefat (*Baccharis salicifolia*), respectively.

One riparian forest type, California Sycamore Series (Sycamore Alluvial Woodland), also does not occur at any of the wetland delineation sites. This vegetation is dominated by California sycamore (*Platanus racemosa*).

Wetland and riparian vegetation types present at the wetland delineation sites include Central Coast Cottonwood-Sycamore Riparian Forest, White Alder Riparian Forest, Arroyo Willow Series (Central Coast Arroyo Willow Riparian Forest), and Coastal and Valley Freshwater Marsh. These types are described in more detail in the following sections.

Central Coast Cottonwood-Sycamore Riparian Forest

This community is the predominant riparian type on the flood plains of the Carmel River and Tularcitos Creek. The dominant species are large trees, including black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), California sycamore, red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), and white alder (*Alnus rhombifolia*). Coast live oak (*Quercus agrifolia*), California buckeye (*Aesculus californica*), and California bay (*Umbellularia californica*) are also found in this riparian forest.

Characteristic shrub species in areas of infrequent flooding include common snowberry (Symphoricarpos albus var. laevigatus), poison-oak (*Toxicodendron diversilobium*), and red-osier dogwood (*Cornus sericea*). Vines such as Pacific blackberry (*Rubus ursinus*) and virgin's bower (*Clematis ligusticifolia*) also may be abundant locally. The herb layer is generally sparse, but herb species such as slough sedge (*Carex barbarae*), stinging

nettle (*Urtica dioica* ssp. *holosericea*), and Douglas' mugwort (*Artemisia douglasiana*) occur locally in the understory.

White Alder Riparian Forest

In areas within and adjacent to the Carmel River and San Clemente Creek channels that are subject to more frequent or more intense flooding, the tree canopy is sparser and less developed. Trees, primarily white alder and red willow, are interspersed with large shrubs such as narrow-leaved willow, mulefat, shrubby arroyo willow, and redosier dogwood. Shrubs and small trees may form dense thickets. A wide variety of herb species occurs in the more open areas. Stands of this community that occupy the edge of the previous high-water line of the reservoir around the reservoir pool have died since the maximum elevation of the reservoir has been lowered by the permanent removal of the flashboards.

Arroyo Willow Series (Central Coast Arroyo Willow Riparian Forest)

This community is dominated by the shrub arroyo willow, with red willow an associated species. The arroyo willow series occurs in two places in the northern portion of the project vicinity. The canopy of the arroyo willow forest is typically dense, with few understory plants. In the project vicinity, a few other shrubs such as coyote brush (*Baccharis pilularis*), poison-oak and vines such as Pacific blackberry may be present. The relatively sparse herbaceous understory includes Douglas' mugwort, California bee-plant (*Scrophularia californica*), and stinging nettle.

Coastal and Valley Freshwater Marsh

There are two retention ponds in the project vicinity north of the existing water treatment facility. These retention ponds are seasonally flooded. During the period in which the surveys were conducted in for the 2000 RDEIR, one of the retention ponds was flooded and created a freshwater marsh or pond habitat referable to the bulrush-cattail series. Viscid bulrush (*Scirpus acutus* var. *occidentalis*) and broad-leaved cattail (*Typha latifolia*) dominated this artificially created marsh habitat (Ecosystems West 1997).

Freshwater marsh areas are present along the Carmel River and San Clemente Creeks. These are generally an understory to the riparian shrub or tree canopy, but small stands without woody canopy are also present. These stands are dominat4ed by a variety of bulrushes, sedges, and other wetland species.

2.3 SOILS

Soils at the wetland study sites for the project belong to five soil mapping units (USDA 1978). One soil is defined as part of the Junipero-Sur complex, soil is defined as part of the Sheridan series, and one soil is defined as part of the rock-outcrop-xerorthent association. Psamments and fluvents, as well as xerorthents, have not been assigned to an association.

At the time the soil survey was completed, the bed of the reservoir was mapped as water. Because this was prior to the reduction in reservoir elevation, much of the now-exposed sediment in the reservoir has not been mapped. This sediment probably consists of psamments and fluvents. However, some of the exposed areas may no longer belong to either the frequently flooded or occasionally flooded categories.

Junipero-Sur complex soils are found on very steep to extremely steep slopes on mountains. These complexes consist of about 35 percent each of Junipero and Sur soils. The remainder consists of soils less than 20 inches deep to bedrock; very stony loamy sands; Sheridan, Vista, and Cienaba soils; and Rock outcrop-Xerorthents association. None of these soils are consider hydric except the Narlon component of Sheridan coarse sandy loam on 5 to 15 percent slopes (USDA 1998, 2004).

In a typical soil profile for the Junipero series, the surface layer from 0 to 5 inches is dark grayish brown sandy loam (very dark gray moist: 10YR 3/1). From 5 to 15 inches, the profile is a dark grayish sandy loam (very dark grayish brown moist: 10YR 3/2). From 15 to 30 inches, the profile is brown gravelly sandy loam (very dark grayish brown moist: 10 YR 3/2) (USDA 1978).

In a typical profile for the Sur series, the surface layer from 0 to 7 inches is a very dark grayish brown stony light sandy loam (very dark brown moist: 10YR 2/2), with gravel and cobblestones. From 7 to 24 inches, the profile is a brown stony light sandy loam (dark brown moist: 7.5 YR 4/4), with about 40 percent gravel, cobblestones, and subangular stones (USDA 1978).

Sheridan coarse sandy loam, 15 to 30 percent slopes is present near the upstream end of the reservoir. Sheridan soils are well-drained soils found on mountains and hills with slopes ranging from five to 75 percent. While these soils usually occur at elevations 1,000 to 3,000 feet, they may be found at elevations up to 5,000 feet on south facing slopes (USDA 1978). Soils included in the Sheridan coarse sandy loam, 15 to 30 percent slopes, map unit are Cieneba, Diablo, McCoy, Pfeiffer, San Andreas, and Vista soils. None of these soils are considered hydric except the Narlon component of Sheridan coarse sandy loam on 5 to 15 percent slopes and Diablo clay on 15 to 30 percent slopes (USDA 1998, 2002).

In a typical profile for the Sheridan series, the surface layer from 0 to 8 inches is a dark grayish brown coarse sandy loam (very dark brown moist; 10YR 2/2), with moderate medium and coarse subangular blocky structure. From 8 to 18 inches, the profile is a dark grayish brown coarse sandy loam (very dark brown moist: 10YR 2/2), with a strong medium and coarse granular structure. From 18 to 28 inches, the profile is a dark grayish brown coarse sandy loam (very dark brown moist: 10YR 2/2), with a strong medium granular structure (USDA 1978).

Rock-outcrop-xerorthent association units consist of rock outcrops and very shallow soils. This association is found on strongly sloping to extremely steep mountains. Four kinds of rock outcrop are included in this association. The rock outcrop type most likely

to be found in the Project area consists of grano-diorite, granite, gabbro, greenstone, serpentine, and limestone (USDA 1978).

Psamments and fluvents along the Carmel River downstream of the dam are mapped as the frequently flooded category. This substrate has undulating areas of stratified sandy, gravelly, and cobbly sediments on floodplains. These soils are considered hydric soils (USDA 2004). The second category of psamments and fluvents are categorized as occasionally flooded and are also considered hydric soils (USDA 2004).

Dissected xerorthents are steep to extremely steep soils on river bluffs, steep escarpments of fans and terraces, and on the banks of deeply entrenched streams with narrow bottoms. Unconsolidated or weakly consolidated alluvium comprises these soils. The alluvium usually contains pebbles and cobblestones (USDA 1978). These soils are not considered hydric (USDA 1998, 2004).

2.4 HYDROLOGY

The study area includes water crossings on the Carmel River and Tularcitos Creek, an access road along the Carmel River, San Clemente Reservoir and the channels and floodplains of the Carmel River and San Clemente Creek immediately upstream of the dam, and a section of an unnamed tributary that reaches the Carmel River from the east. Potentially jurisdictional wetlands and other waters of the U.S. that may be affected by with Project activities are associated with these water bodies.

This section describes 1) the parameters used to determine potential jurisdictional wetlands of the United States based on the Corps' *Wetland Delineation Manual* (USACOE 1987) 2) the criteria used to determine other waters of the United States, and 3) the field methods used to apply these parameters.

3.1 CORPS PARAMETERS

Three parameters (vegetation, soils and hydrology) are used by the Corps to determine jurisdictional wetlands. A summary of these parameters is presented below.

3.1.1 HYDROPHYTIC VEGETATION

Hydrophytic vegetation is defined in the Corps' *Wetland Delineation Manual* (USACOE 1987) as *"macrophytic plant life that occurs in areas where the frequency and duration of soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present."* For a site to be defined as supporting hydrophytic vegetation, the dominant plant species must be species that, by virtue of physiological and reproductive adaptations, are adapted to wetland inundation or saturated soils. Table 3-1 provides a listing of plant categories and their indicator status (i.e., probability of occurrence in wetlands).

3.1.2 HYDRIC SOILS

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (SSS 1997). These soils usually support hydrophytic vegetation.

3.1.3 WETLAND HYDROLOGY

The driving force creating wetlands is "wetland hydrology"; that is, permanent or periodic inundation, or soil saturation, for a significant period (usually a week or more) during the growing season. Wetland hydrology refers to the hydrologic regime of an area that is periodically inundated, or the soils of which are saturated to the surface, at some time during the growing season. Ponded or standing water for seven or more days indicates wetland hydrology.

Table 3-1. Indicator Codes for Plant Species

INDICATOR CATEGORY	CODE	DESCRIPTION
Obligate Wetland Plant	OBL	Occurs almost always (estimated probability >99%) under natural conditions in wetlands.
Facultative Wetland Plant	FACW	Usually occurs in wetlands (estimated probability 67% to 99%), but occasionally found in non-wetlands.
Facultative Plant	FAC	Equally likely to occur in wetlands or non-wetlands (estimated probability 34% to 66%).
Facultative Upland Plant	FACU	Usually occurs in non-wetlands (estimated probability 67% to 99%), but occasionally found in wetlands (estimated probability 1% to 33%).
Obligate Upland Plant	UPL	Occurs in wetlands in other regions, but almost always occurs (estimated probability >99%) under natural conditions in non-wetlands in the region specified.

+ indicates increased probability of occurrence in wetlands
- indicates decreased probability of occurrence in wetlands

3.2 FIELD METHODS

The methods used in the delineation of potential jurisdictional wetland areas at the project site are consistent with those 1) outlined in the Corps' *Wetlands Delineation Manual* (1987) and subsequent comments and 2) outlined in the National Food Security Act Manual (1996) and its amendments. Standard methods were employed to obtain data on the vegetation, soils and hydrology at the project site.

3.2.1 INITIAL IDENTIFICATION OF WETLANDS

Initial identification of potential wetlands was based on previous delineations at the site. Review of aerial photographs and field observations confirmed the presence of additional potential wetlands and other waters of the United States at proposed construction or disposal sites.

3.2.2 SELECTION OF SAMPLE SITES

A wetland delineation of the potential jurisdictional wetland areas was conducted by ENTRIX staff (Gretchen Lebednik, botanist, Keven Ann Colgate, biologist, Ruth Sundermeyer, biologist, and Gina Morimoto, biologist) on July 18-22, 2005; August 9 and 10, 2005; and February 27-28, 2006). Potential jurisdictional wetlands in the project area consisted of stream-side vegetation that transitioned in non-jurisdictional riparian or upland vegetation. Sample site locations were selected to establish the boundaries between the jurisdictional and non-jurisdictional components (see Figure A-1 in Appendix A). Fifty-six sample sites were selected (CB1A, CB1B, CB2A, CB2B, CF1A, CF1B, CF1C, CF1D, CF2A, CF2B, CF2C, CF2D, CRW1, CRW2, CRW3, CRW4, CRW5, CRW6, CRW7, CRW8, CRW9, CRW10, CRW11A, CRW11B, DR1A, DR1B, DR2A, DR2B, DR3A, DR3B, DR4A, DR4B, DR5A, DR5B, SC1, SC2, SC3, SC4, SC5, SC6, TC1A, TC1B, TC1C, TC1D, TC2A, TC2B, TC3A, TC3B, TC3C, TC3D, TR1A, TR2A, TR2B, TR3A, TR4A, TR4B).

3.2.3 HYDROPHYTIC VEGETATION

At each site, herbaceous vegetation in five-foot radius was identified. Woody vegetation was usually identified for a 30-foot radius, unless that extent crossed into another vegetation type. Hydrophytic vegetation was considered to be present if more than 50 percent of the dominant species had a wetland indicator status of FAC, FACW, or OBL. The indicator status of each species was obtained from the *National List of Plant Species that Occur in Wetlands: California* (USFWS 1988), which is summarized in Table 3-2. The taxonomy of plants is based on Hickman (1993).

3.2.4 HYDRIC SOILS

Due to wetness during the growing season, hydric soils usually develop certain morphological properties that can be readily observed in the field. Prolonged anaerobic soil conditions typically lower the soil redox potential and cause a chemical reduction of some soil components, mainly iron oxides and manganese oxides. This reduction affects

solubility, movement, and aggregation of these oxides. Reduction is reflected in the soil color and other physical characteristics that are usually indicative of hydric soils.

Table 3-2. Wetland Plant Species Observed Within the 2006 San Clemente Dam Seismic Retrofit Wetland Delineation Study Area.

Scientific Name	Common Name	Indicator
Alnus rhombifolia	white alder	FACW
Artemisia douglasiana	mugwort	FACW
Baccharis salicifolius	mulefat	FACW
Bromus madritensis ssp. *rubens*	red brome	NI
Carex sp.	sedge	OBL to UPL
Clematis ligusticifolia	western white clematis	FAC
Cornus sericea	red-osier dogwood	FACW
Cyperus eragrostis	tall flatsedge	FACW
Eleocharis sp.	spikerush	OBL
Equisetum sp.	scouring rush	FACW -FAC
Euthamia occidentalis	western goldenrod	OBL
Helenium puberulum	sneeze-weed	FACW
Juncus sp.	rush	OBL to FAC
Leymus triticoides	beardless wildrye	FAC+
Mentha arvensis	wild mint	FACW
Platanus racemosa	California sycamore	FACW
Polypogon monspeliensis	annual rabbit's-foot grass	FACW+
Populus balsamifera ssp. *trichocarpa*	black cottonwood	FACW
Potentilla glandulosa	sticky cinquefoil	FAC
Ribes sp.	currant	varies
Rubus ursinus	California blackberry	FAC+
Salix lasiolepis	arroyo willow	FACW
Salix sp.	willow	OBL-FACW
Scirpus acutus var. *occidentalis*	viscid bulrush	OBL
Scirpus microcarpus	panicled bulrush	OBL
Scirpus robustus	alkali bulrush	OBL
Typha spp.	cattail	OBL
Umbellularia californica	California bay	FAC

Soil pits were excavated to 12 to 16 inches to examine the soil at each sample site where it was possible to dig. The soil chroma for each soil pit was characterized by the appropriate Munsell soil color chart (Munsell Color 1994). Each soil sample was described by its Hue notation of color, which indicates its relation to red, yellow, green, blue, and purple; its Value notation, which indicates lightness; and its Chroma notation, which indicates its departure from a neutral color of the same lightness. In this study area, pits could not be dug at many sites due to the presence of rocks, dense, woody roots, or other impediments to excavation. These sites were evaluated variously by observations of inundation during a portion of the growing season, extrapolation from similar sites, and confirmation of a mapped hydric soil type.

3.2.5 WETLAND HYDROLOGY

Numerous factors influence the wetness of an area including precipitation, stratigraphy, topography, soil permeability, and plant cover. The frequency and duration of inundation or soil saturation are important in separating wetlands from non-wetlands. Duration usually is the more important factor. Soil permeability, related to the texture of the soil, influences the duration of inundation and soil saturation. For example, clayey soils absorb water more slowly than sandy or loamy soils, and therefore have slower permeability and remain saturated much longer. The type and amount of plant cover also affect both the degree of inundation and duration of saturated soil conditions. Excess water drains more slowly in areas of abundant plant cover, thereby increasing duration of inundation and soil saturation. On the other hand, transpiration rates are higher in areas of abundant plant cover, which may reduce the duration of soil saturation.

At each sample site, the depth to saturated soil in the excavated pit was measured and primary indicators, such as inundation and water marks, were documented.

3.2.6 DATA FORMS

The data collected were used to complete the data forms for routine wetland determination, as specified in the Corps' *Wetlands Delineation Manual* (1987). The completed data forms are included in Appendix A.

3.2.7 OTHER WATERS OF THE UNITED STATES

Other waters of the United States were determined by estimating the ordinary high water mark (OHWM) on the reservoir and the streams with defined beds and banks in the Project area and alternatives and mapping the areas that lie below this elevation. In the sediment plain above the dam, the channel of the river braids and may shift. Although there are extensive stands of riparian vegetation in this area, other sections that have been exposed since the maximum water elevation was lowered are being colonized by upland species. In this area, other waters of the U.S. were defined by the wetted channel as it existed at the time of the delineations. The actual extent and location of these channels may vary from year to year.

This section describes the results of the wetland delineation and other waters of the U.S. present in the study area.

4.1 WETLANDS DELINEATION

The maximum extent of possible jurisdictional waters of the United States (as defined under Section 404 of the Clean Water Act) that may be directly affected by the proposed project or its alternatives is approximately 12.6 acres (5.1 hectares). The results of the wetland delineation are shown in Figure A-1 (Appendix A). This total does not include the approximately 2.1 acres (0.8 hectare) of wetlands identified in a strip between the access road and the Carmel River upstream of the concrete ford, but below the plunge pool (a reach that is approximately 6.570 feet long). The width of jurisdictional wetlands along this reach varies from 7 feet to 35 feet. At this time, that area is not expected to be impacted by project activities.

4.1.1 WETLANDS MEETING JURISDICTIONAL CRITERIA ABOVE SAN CLEMENTE DAM

The areas assessed above the dam encompass all of the areas potentially affected by the proposed project and the various alternatives along the Carmel River, San Clemente Creek, and Tularcitos Creek. Locations with potential jurisdictional wetlands and other Waters of the U.S. in the Project area for the Proponent's Proposed Project and alternatives include Tularcitos Creek at the new Tularcitos access road crossing, the concrete ford on an existing access road, the Old Carmel Dam bridge, the existing plunge pool access road along the east side of the Carmel River (which requires improvements), the plunge pool at the San Clemente Dam, and the reservoir flood plain upstream of the San Clemente Dam .

Olberding and Associates conducted a separate field survey of the CVFP settling basins in 1997. The U.S. Army Corps of Engineers (USACE) concurred with this study in determining that the settling basins are not considered to be jurisdictional wetlands or waters of the U.S. because they are artificial settling basins constructed on dry land for the purpose of collection and detention of piped sediment-laden water from the CVFP. CVFP activities are ongoing, the source of hydrology in the settling basins is artificial and, under normal circumstances, wetland vegetation would not be present.

Wetlands in the project area for the Proponent's Proposed Project and Alternatives consist primarily of riparian vegetation associated with the Carmel River, Tularcitos Creek, and the flood plain of the reservoir along the Carmel River and San Clemente Creek. This riparian vegetation would be classified as palustrine forested wetlands in the Cowardin system where the trees are taller than 20 feet, or as palustrine or lacustrine shrub-scrub wetlands where the woody vegetation is less than 20 feet tall (Cowardin 1979). Where only herbaceous vegetation is present, the Cowardin classification would

be “palustrine emergent wetlands”, ranging from “permanently flooded” to “seasonally flooded”.

The 1994 delineation was conducted when much of this area was below the ordinary high water level of 537 feet. By 1997, when the ordinary high water level had been dropped to 525 feet, much of this area was exposed. The 1997 delineation report noted that there were areas at the base of slopes along the former shoreline that met all three criteria. Observations made at that time suggested that these features might continue to meet those criteria, although it was not clear that they would remain in the long term.

In the 2005 delineation, some of these areas were still identifiable, but they no longer met the criteria, with the exception of the shoreline of a pond at CRW10.

Areas meeting the criteria were mapped at CRW1, CRW2, CRW3, CRW4, CRW6, CRW7, CRW8, CRW9, CRW10, TR2A, TR4A, SC1, SC2, SC3, SC4, SC5, and SC6. At most of these sites, the jurisdictional wetland area consisted of small, narrow stands along the stream channels.

The TR2A, TR4A sites at the upstream end of the Carmel River arm of the reservoir were ponded backwater areas located adjacent to the main channel of the river. During high flow events these areas are hydraulically connected to the main channel and receive surface flow. Under normal conditions these sites are isolated from the main channel and water is typically ponded. Herbaceous vegetation at these wetland sites was dominated by cattails (*Typha* spp.) bulrushes (*Scirpus* spp.) sedges (*Carex* spp.) and nutsedges (*Cyperus* spp.). Woody vegetation was dominated by white alder (FACW) and willows (OBL to FACW). Wetland soils were indicated by low chroma colors (5 Y 3/1) without mottling where they were observable. At many locations, however, the stand was at the edge of inundation. No other indicators of hydric soil were observed. Typical indicators of hydrology at wetland sites included inundation or saturation in the upper 12 inches, water marks, drift lines and/or sediment deposits.

4.1.2 Wetlands Meeting Jurisdictional Criteria Below San Clemente Dam

Wetlands meeting jurisdictional criteria were mapped at the Tularcitos Creek, which transverses the concrete ford crossing of the Carmel River, along the Carmel River and parallel access road at the Old Carmel River Bridge, and at the plunge pool. Vegetation in these wetlands is generally dominated by white alder (FAC), black cottonwood (FACW), California sycamore (FACW), willows, (FAC to OBL), sedges (FAC to OBL), and California blackberry (FAC+), although numerous other indicator species were also recorded (Table 3-2). Soils in these areas were generally rocky, and many met the wetland criterion because they match the description of the mapped hydric soil unit. In a few instances where it was not possible to dig soil pits, the hydric condition of the soil was assumed, based on the hydrology, the dominance of obligate wetland species, or the conditions at a similar site nearby. Hydrologic indicators vary, but include saturation in the upper twelve inches, drift lines, and sediment deposits.

These wetlands include 0.02 acre (0.01 hectare) at the access road (bridge), 0.04 acre (0.02 hectare) at the plunge pool, 0.01 acre (0.004 hectare) at the Tularcitos crossing, 0.06 acre (0.02 hectare) at the concrete ford, 0.6 acre (0.2 hectare) at the Carmel River downstream of plunge pool, and 0.2 acre (0.08 hectare) along the Carmel River, San Clemente Creek, and reservoir pool.

4.2 OTHER WATERS OF THE U.S.

Other waters of the U.S. in the project area include the Carmel River, San Clemente Creek, Tularcitos Creek, the unnamed tributary drainage in which the sediment disposal site is located, and the lower reservoir shoreline of San Clemente Reservoir.

At the Tularcitos Creek crossing, the width at the OHWM averaged 12.5 feet (3.8 meters). The total area of jurisdictional other waters of the U.S. in the 100-foot long study area is 0.03 acre (0.01 hectare).

At the concrete ford crossing of the Carmel River, the width at the OHWM averaged 15.4 feet (4.7 meters). The total area of jurisdictional other waters of the U.S. in the 100-foot long study area is 0.04 acre (0.01 hectare).

At the plunge pool, the total area of jurisdictional other waters of the U.S. in the project area is 0.2 acre (0.08 hectare).

Above the dam, the total area of jurisdictional other waters of the U.S. is 10.9 acres (4.4 hectare). Of this, 0.2 acre (0.1 hectare) comprises the 1,749-foot (533 meters) length of San Clemente Creek, 4.1 acres (1.6 hectares) comprise the 9,543-foot (2,909 meters) length of the Carmel River with its side channels, and 6.84 acres (2.8 hectares) comprise the reservoir pool. Although the sediment floodplain of San Clemente Creek widens to almost 340 feet (104 meters) at the reservoir, it is considerably narrower for most of its length than the sediment floodplain of the Carmel River, which varies from 47 to 580 feet (14 to 177 meters) in width in this part of the project area.

At the sediment disposal site, the total length of jurisdictional other waters of the U.S. is 1,755 feet (534.9 meters). The total area of jurisdictional other waters of the U.S. is 0.12 acre (0.05 hectare). The main channel upstream of the jeep trail is 1,695 feet (516.6 meters) in length, with an average width of 3 feet (0.91 meter) providing 0.12 acre (0.05 hectare) of other waters of the U.S. Two side channels have defined beds and banks for short distances. These are 20 feet (6.1 meters) by an average of 1 foot (0.3 meter) wide and 40 feet (12.2 hectare) by 1 foot (0.3 meter) wide, providing 0.0005 acre (0.0002 hectare) and 0.001 acre (0.0004 hectare) of other waters of the U.S., respectively.

5.0
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APPENDIX A
Maps of Potential Jurisdictional Seasonal Wetlands and Other Waters of the U.S. at the San Clemente Dam Seismic Safety Project and Alternatives Sites in Monterey County, California



Legend

Wetland Delineation Sites

- Sample points
- Stream
- Freshwater marsh
- Jurisdictional riparian
- Other waters of the U.S.
- Upland riparian

1:2,400

Projection: NAD83
Datum: Lambert Conformal Conical

0 160 320 640 960 1,280 Feet

Project Vicinity

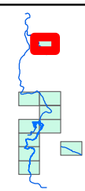
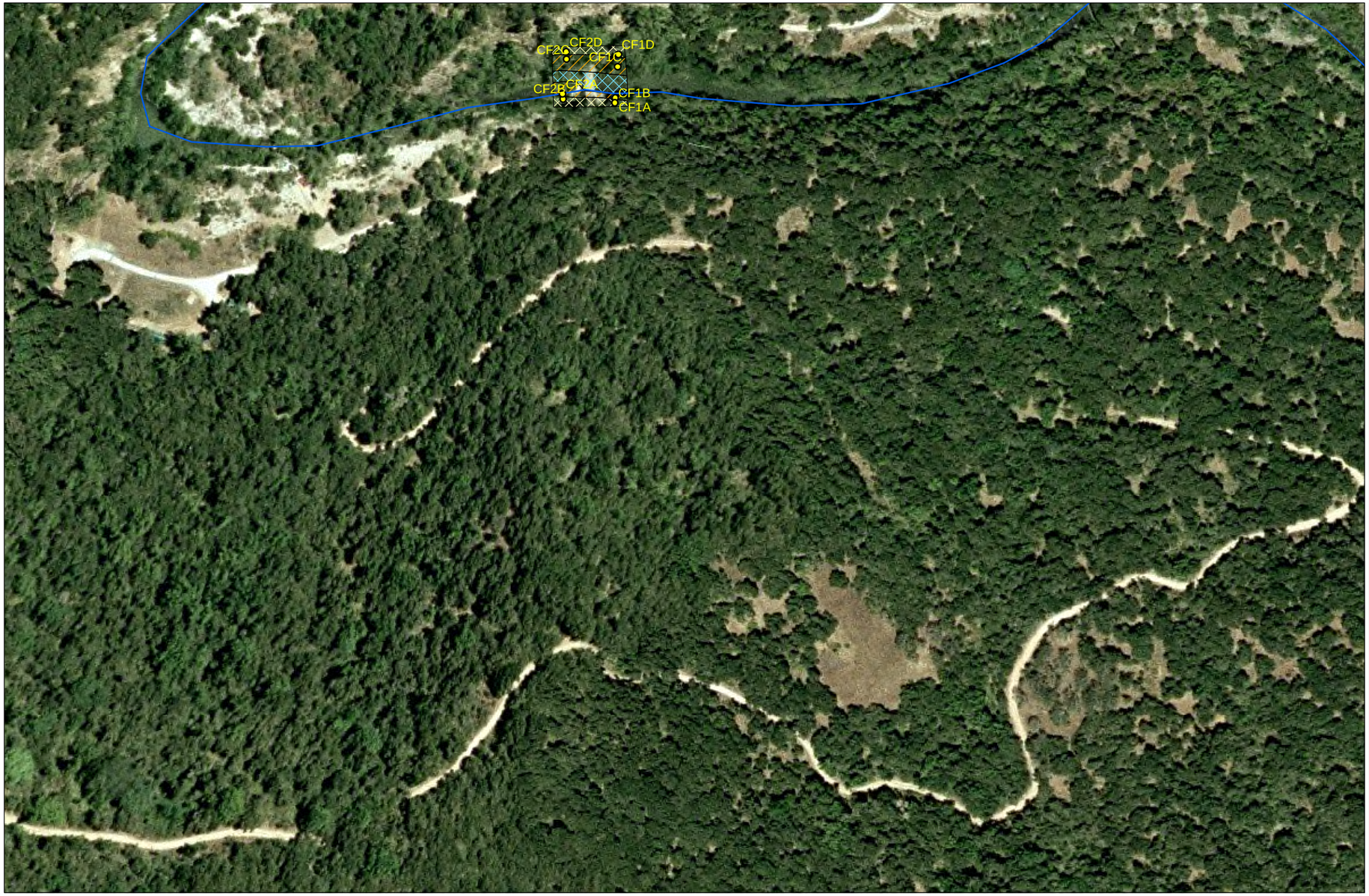


Figure A-1
Wetlands and Other Waters of the U.S. in the Project Area
Tile 1 of 10

ENTRIX



Legend

Wetland Delineation Sites

- Sample points
- Stream
- Freshwater marsh
- Jurisdictional riparian
- Other waters of the U.S.
- Upland riparian

1:2,400

Projection: NAD83
Datum: Lambert Conformal Conical

0 160 320 640 960 1,280 Feet

Project Vicinity

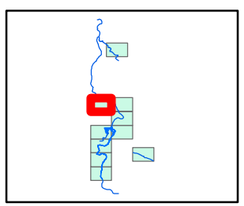


Figure A-1
Wetlands and Other Waters of the U.S. in the Project Area
Tile 2 of 10

ENTRIX



Legend

Wetland Delineation Sites

- Sample points
- Stream
- Freshwater marsh
- Jurisdictional riparian
- Other waters of the U.S.
- Upland riparian

1:2,400

Projection: NAD83
Datum: Lambert Conformal Conical

0 160 320 640 960 1,280 Feet

Project Vicinity

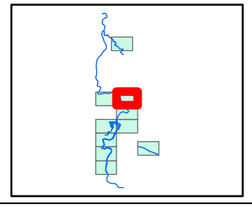


Figure A-1
Wetlands and Other Waters of the U.S. in the Project Area
Tile 3 of 10

ENTRIX



Legend

Wetland Delineation Sites

- Sample points
- Stream
- Freshwater marsh
- Jurisdictional riparian
- Other waters of the U.S.
- Upland riparian

1:2,400

Projection: NAD83
Datum: Lambert Conformal Conical

0 160 320 640 960 1,280 Feet

Project Vicinity

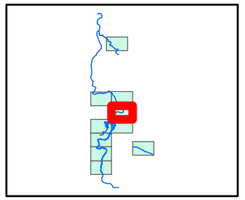


Figure A-1
Wetlands and Other Waters of the U.S. in the Project Area
Tile 4 of 10

ENTRIX



Legend

Wetland Delineation Sites

- Sample points
- Stream
- Freshwater marsh
- Jurisdictional riparian
- Other waters of the U.S.
- Upland riparian

1:2,400

Projection: NAD83
Datum: Lambert Conformal Conical

0 160 320 640 960 1,280 Feet

Project Vicinity

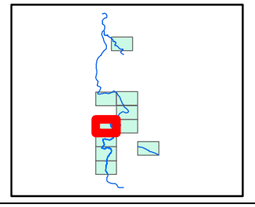
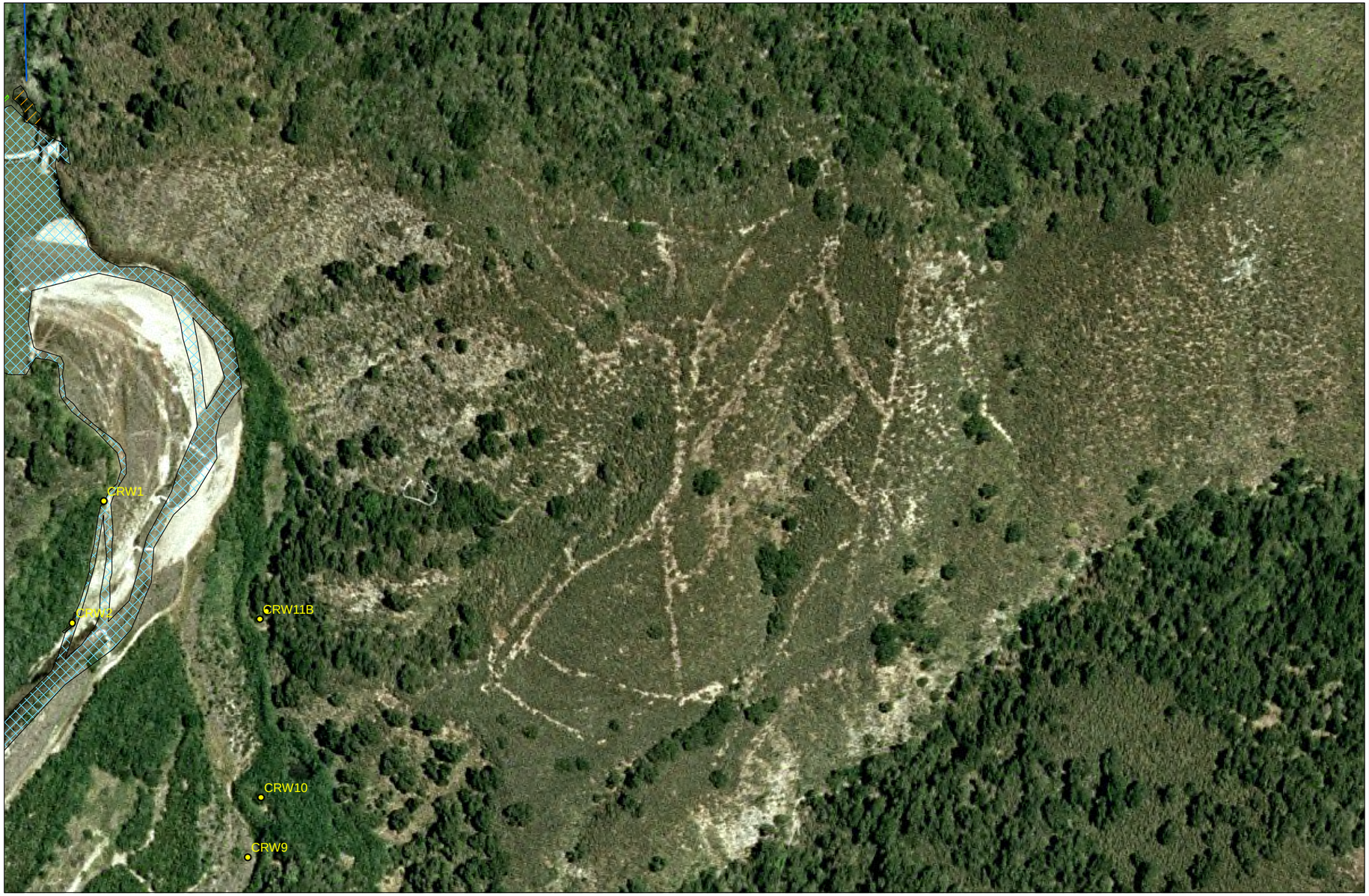


Figure A-1
Wetlands and Other Waters of the U.S. in the Project Area
Tile 5 of 10

ENTRIX



Legend

Wetland Delineation Sites

- Sample points
- Stream
- Freshwater marsh
- Jurisdictional riparian
- Other waters of the U.S.
- Upland riparian

1:2,400

Projection: NAD83
Datum: Lambert Conformal Conical

0 160 320 640 960 1,280 Feet

Project Vicinity

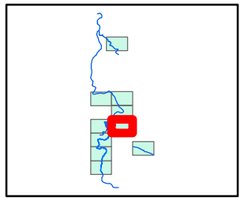


Figure A-1
Wetlands and Other Waters of the U.S. in the Project Area
Tile 6 of 10

ENTRIX



Legend

Wetland Delineation Sites

- Sample points
- Stream
- Freshwater marsh
- Jurisdictional riparian
- Other waters of the U.S.
- Upland riparian

1:2,400

Projection: NAD83
Datum: Lambert Conformal Conical

®

0 160 320 640 960 1,280 Feet

Project Vicinity

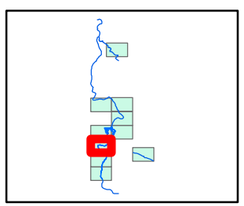


Figure A-1
Wetlands and Other Waters of the U.S. in the Project Area
Tile 7 of 10

ENTRIX



Legend

Wetland Delineation Sites

- Sample points
- Stream
- Freshwater marsh
- Jurisdictional riparian
- Other waters of the U.S.
- Upland riparian

1:2,400

Projection: NAD83
Datum: Lambert Conformal Conical

®

0 160 320 640 960 1,280 Feet

Project Vicinity

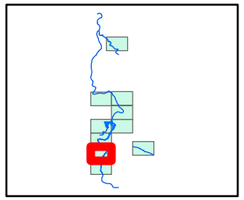


Figure A-1
Wetlands and Other Waters of the U.S. in the Project Area
Tile 8 of 10

ENTRIX



Legend

Wetland Delineation Sites

- Sample points
- Stream
- Freshwater marsh
- Jurisdictional riparian
- Other waters of the U.S.
- Upland riparian

1:2,400

Projection: NAD83
Datum: Lambert Conformal Conical

N

0 160 320 640 960 1,280 Feet

Project Vicinity

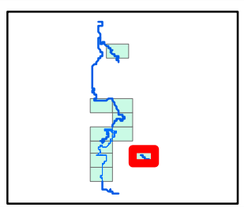


Figure A-1
Wetlands and Other Waters of the U.S. in the Project Area

Tile 9 of 10

ENTRIX



Legend

Wetland Delineation Sites

- Sample points
- Stream
- Freshwater marsh
- Jurisdictional riparian
- Other waters of the U.S.
- Upland riparian

1:2,400

Projection: NAD83
Datum: Lambert Conformal Conical

0 160 320 640 960 1,280 Feet

Project Vicinity

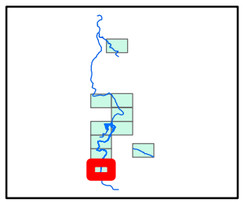


Figure A-1
Wetlands and Other Waters of the U.S. in the Project Area
Tile 10 of 10

ENTRIX

APPENDIX B
Data Forms

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Freshwater marsh

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: TC1A

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TC1

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Scirpus microcarpus*	H	OBL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☒ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below OHWM

SOILS Plot ID: TC1A

Map Unit Name
(Series and Phase) Xerorthents, dissected Drainage Class: Variable
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Site is vegetated by obligate wetland indicator species and is below the OHWM.

TC1A is in section adjacent to channel. TC1B is upslope.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (assumed) (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

No pit dug – could not penetrate roots

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: TC1B

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TC1

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Populus balsamifera* ssp. *trichocarpa*	T	FACW	9.		
2. *Salix sp.*	T	OBL-FACW	10.		
3. *Quercus agrifolia*	T	UPL	11.		
4. *Toxicodendron diversilobum*	S	UPL	12.		
5. *Rubus ursinus*	S	FAC+	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 60%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A__ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Above the OHWM

SOILS Plot ID: TC1B

Map Unit Name
(Series and Phase) Xerorthents, dissected Drainage Class: Variable

Taxonomy (Subgroup): N/A Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

TC1A is in section adjacent to channel. TC1B is upslope.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

No pit dug – could not penetrate roots

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Freshwater marsh

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: TC1C

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TC1

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Scirpus microcarpus*	H	OBL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: N/A (in.)

Depth to Saturated Soil N/A (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks:

SOILS Plot ID: TC1C

Map Unit Name
(Series and Phase) Xerorthents, dissected Drainage Class: Variable

Taxonomy (Subgroup): N/A Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Site is vegetated by obligate wetland indicator species and is below the OHWM.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (assumed) Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: TC1D

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TC1

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Populus balsamifera* ssp. *trichocarpa*	T	FACW	9.		
2. *Quercus agrifolia*	T	UPL	10.		
3. *Salix* sp.	S	OBL-FACW	11.		
4. *Ribes* sp.	S	varies	12.		
5. *Pteridium aquilinum*	H	FACU	13.		
6. *Rubus ursinus*	S	FAC+	14.		
7. *Clematis* sp.	V	varies	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): Probably 60% or more

Remarks: Clematis is probably *Clematis ligusticifolia*, a FAC indicator species.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)

Depth to Free Water in Pit: _N/A_ (in.)

Depth to Saturated Soil _N/A_ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Above the OHWM

SOILS Plot ID: TC1D

Map Unit Name
(Series and Phase) Xerorthents, dissected Drainage Class: Variable

Taxonomy (Subgroup): N/A Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10YR 3/2			

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

A 2-inch layer of lighter sand was present in part of the pit at depth below surface of 3 inches

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: TC2A
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TC2
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salix* sp.	T	FACW	9.		
2. *Rubus ursinus*	S	FAC+	10.		
3. *Toxicodendron diversilobum*	S	UPL	11.		
4. *Clematis* sp.	V	varies	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): At least 50% and probably 75%

Remarks: Clematis is probably *Clematis ligusticifolia* (FAC)

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: __N/A_ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☒ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below OHWM. Soil at channel appeared to be saturated at the surface.

SOILS Plot ID: TC2A

Map Unit Name
(Series and Phase) Xerorthents, dissected Drainage Class: Variable
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Could not penetrate roots without collapsing bank into stream. No pit dug.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (assumed) (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

TC2A is in section adjacent to channel. TC2B is upslope.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: TC2B
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TC2
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salix* sp.	T	FACW	9.		
2. *Cornus sericea*	T	FACW	10.		
3. *Rubus ursinus*	S	FAC+	11.		
4. *Toxicodendron diversilobum*	S	UPL	12.		
5. *Clematis* sp.	V	varies	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): At least 60%, probably 80%

Remarks: Clematis is probably *Clematis ligusticifolia* (FAC)

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: __N/A_ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Above OHWM, soil is not saturated at the surface. Upslope from TC2A.

SOILS Plot ID: TC2B

Map Unit Name
(Series and Phase) Xerorthents, dissected Drainage Class: Variable

Taxonomy (Subgroup): N/A Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Could not dig pit through dense tree roots.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

TC2A is in section adjacent to channel. TC2B is upslope.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/20/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: TC3A

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TC3

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Populus balsamifera* ssp. *trichocarpa*	T	FACW	9.		
2. *Umbellularia californica*	T	FAC	10.		
3. *Quercus agrifolia*	T	UPL	11.		
4. *Symphoricarpos* sp.	S	FACU - UPL	12.		
5. *Toxicodendron diversilobum*	S	UPL	13.		
6. *Rubus ursinus*	S	FAC+	14.		
7. *Pteridium aquilinum*	H	FACU	15.		
8. *Helenium puberulum*	H	FACW	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 50%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: >16 (in.)

Depth to Saturated Soil >16 (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Above OHWM

SOILS Plot ID: TC3A

Map Unit Name
(Series and Phase) Xerorthents, dissected Drainage Class: Variable

Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
		Light-colored			sandy

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Rainy day. Colors could not be reliably determined under canopy

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

TC3A is upslope from TC3B

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/20/2005
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: TC3B
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TC3
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salix* sp.	T	FACW	9.		
2. *Cornus sericea*	T	FACW	10.		
3. *Eleocharis* sp.	H	OBL	11.		
4. *Helenium puberulum*	H	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below OHWM.

SOILS Plot ID: TC3B

Map Unit Name
(Series and Phase) Xerorthents, dissected Drainage Class: Variable
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Could not penetrate roots. No pit dug. All dominant species obligate or facultative wetland indicators

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (assumed) (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks

TC3A is upslope from TC3B:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/20/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Bare bank

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: TC3C

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TC3

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.			9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-):

Remarks: Bank is bare – no vegetation.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☐ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below OHWM – other waters of the U.S.

SOILS Plot ID: TC3C

Map Unit Name
(Series and Phase) Xerorthents, dissected Drainage Class: Variable
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

Below OHWM – other waters of the U.S.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: TC3D
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TC3
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salix* sp.	T	FACW	9.		
2. *Cornus sericea*	T	FACW	10.		
3. *Toxicodendron diversilobum*	S	UPL	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-):

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Above OHWM

SOILS Plot ID: TC3D

Map Unit Name
(Series and Phase) Xerorthents, dissected Drainage Class: Variable

Taxonomy (Subgroup): N/A Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Could not dig pit through dense tree roots.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? Yes No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

Upslope from TC3C.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/18/2005
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CF1A
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CF1
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Carex* sp.	H	varies	10.		
3. unidentified grass	H	varies	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): At least 67%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM

SOILS Plot ID: CF1A

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/18-19/2005
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Coast live oak woodland
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CF1B
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CF1
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Quercus agrifolia*	T	UPL	9.		
2. *Alnus rhombifolia*	T	FACW	10.		
3. *Rubus ursinus*	S	FAC+	11.		
4. *Toxicodendron diversilobum*	S	UPL	12.		
5. *Pteridium aquilinum*	H	FACU	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 40%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: N/A (in.)
Depth to Free Water in Pit: >16 (in.)
Depth to Saturated Soil >16 (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Above the OHWM

SOILS Plot ID: CF1B

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive

Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10YR 3/3	N/A	N/A	sandy

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CF1C
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CF1
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Salix* sp.	T	OBL-FACW	10.		
3. *Salix* sp.	S	OBL-FACW	11.		
4. *Scirpus microcarpus*	H	OBL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM

SOILS Plot ID: CF1C

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Central Coast cottonwood-sycamore riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CF1D

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CF1

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Platanus racemosa*	T	FACW	9.		
2. *Alnus rhombifolia*	T	FACW	10.		
3. *Rubus ursinus*	S	FAC+	11.		
4. *Scirpus microcarpus*	H	OBL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: __N/A__ (in.)

Depth to Free Water in Pit: __>12__ (in.)

Depth to Saturated Soil __>12__ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Above the OHWM

SOILS Plot ID: CF1D

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12		10YR 3/3	N/A	N/A	Sandy, rock and cobble

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: many roots

Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CF2A

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CF2

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Alnus rhombifolia*	S	FACW	10.		
2. *Carex* sp.	H	OBL-FAC	11.		
4. unidentified grass	H	varies	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 75%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☒ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM

SOILS Plot ID: CF2A

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:
All cobble – no pit dug

Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Central Coast cottonwood-sycamore riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CF2B

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CF2

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Populus balsamifera* ssp. *trichocarpa*	T	FACW	9.		
2. *Alnus rhombifolia*	T	FACW	10.		
3. *Populus balsamifera* ssp. *trichocarpa*	S	FACW	11.		
4. *Toxicodendron diversilobum*	S	UPL	12.		
5. *Rubus ursinus*	S	FAC+	13.		
6. *Pteridium aquilinum*	H	FACU	14.		
7. *Carex* sp.	H	varies	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): At least 71%, probably 86%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: >13 (in.)

Depth to Saturated Soil >13 (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Above the OHWM

SOILS Plot ID: CF2B

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive

Taxonomy (Subgroup): N/A Field Observations
Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-13		10Yr 4/3			Sandy site among cobbles

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CF2C

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CF2
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Salix lasiolepis*	S	FACW	10.		
3. *Alnus rhombifolia*	S	FACW	11.		
4. *Rubus ursinus*	S	FAC+	12.		
5. *Scirpus microcarpus*	H	OBL	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM

SOILS Plot ID: CF2C

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Central Coast cottonwood-sycamore riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CF2D

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CF2

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Platanus racemosa*	T	FACW	9.		
2. *Salix* sp.	T	OBL-FACW	10.		
3. *Umbellularia californica*	T	FAC	11.		
4. *Salix lasiolepis*	S	FACW	12.		
5. *Baccharis pilularis*	S	UPL	13.		
6. *Rubus ursinus*	S	FAC+	14.		
7. *Scirpus microcarpus*	H	OBL	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 86%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Above the OHWM

SOILS Plot ID: CF2D

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/20/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: DR1A

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: DR1

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Carex* sp.	H	varies	10.		
3. *Mentha arvensis*	H	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): At least 67 %, probably 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: 0 (in.)

Depth to Free Water in Pit: N/A (in.)

Depth to Saturated Soil 0 (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☒ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Saturated at surface at edge, below OHWM

SOILS Plot ID: DR1A

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

No pit dug. Soil was saturated at surface.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (assumed) (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/20/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Central Coast cottonwood-sycamore riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: DR1B

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: DR1

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Platanus racemosa*	T	FACW	9.		
2. *Umbellularia californica*	T	FAC	10.		
3. *Rubus ursinus*	S	FAC+	11.		
4. *Stachys bullata*	H	UPL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 75%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

FIELD OBSERVATIONS:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: ____ (in.)

Depth to Saturated Soil ____ (in.)

Remarks: Above OHWM, rocky slope

SOILS Plot ID: DR1B

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Very rocky slope, no pit dug. Mapped type is a hydric soil, according to Monterey County Hydric Soils list, but this slope may not belong to that category.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/20/2005
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: DR2A
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: DR2
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Salix* sp.	S	OBL-FACW	10.		
3. *Alnus rhombifolia*	T	FACW	11.		
4. *Carex* sp.	H	varies	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): At least 75%, probably 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below OHWM

SOILS Plot ID: DR2A

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Rocks, cobble, tree roots. No pit dug. Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/20/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Central Coast cottonwood-sycamore riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: DR3A

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: DR3

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Platanus racemosa*	T	FACW	10.		
3. *Alnus rhombifolia*	S	FACW	11.		
4. *Carex* sp.	H	varies	12.		
5. *Euthamia occidentalis*	H	OBL	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): At least 80%, probably 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☐ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☒ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM. Edge along channel is saturated at the surface.

SOILS Plot ID: DR3A

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Very rocky – no pit dug. Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/20/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Central Coast cottonwood-sycamore riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: DR3B

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: DR3

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Platanus racemosa*	T	FACW	9.		
2. *Populus balsamifera* ssp. *trichocarpa*	T	FACW	10.		
3. *Genista monspessulana*	S	UPL	11.		
4. *Heteromeles arbutifolia*	S	UPL	12.		
5. *Toxicodendron diversilobum*	S	UPL	13.		
6. *Leymus triticoides*	H	FAC+	14.		
7. *Torilis arvensis*	H	UPL	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 43%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☐ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Above OHWM

SOILS Plot ID: DR3B

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Boulders – no pit dug. Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/20/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Central Coast cottonwood-sycamore riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: DR4A

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: DR4
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Populus balsamifera* ssp. *trichocarpa*	T	FACW	10.		
3. *Populus balsamifera* ssp. *trichocarpa*	S	FACW	11.		
4. *Rubus ursinus*	S	FAC+	12.		
5. *Carex* sp.	H	varies	13.		
6. *Equisetum* sp.	H	FACW -FAC	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): At ;east 83%, probably 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☒ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM, in an area that was previously ponded

SOILS Plot ID: DR4A

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Rocky – no pit dug. Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/20/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Central Coast cottonwood-sycamore riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: DR4A

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: DR4
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Populus balsamifera* ssp. *trichocarpa*	T	FACW	10.		
3. *Populus balsamifera* ssp. *trichocarpa*	S	FACW	11.		
4. *Rubus ursinus*	S	FAC+	12.		
5. *Carex* sp.	H	varies	13.		
6. *Equisetum* sp.	H	FACW -FAC	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): At ;east 83%, probably 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☒ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM, in an area that was previously ponded

SOILS Plot ID: DR4A

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Rocky – no pit dug. Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/20/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: DR4B

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: DR4
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Salix* sp.	S	OBL -FACW	10.		
3. *Umbellularia californica*	S	FAC	11.		
4. *Rubus ursinus*	S	FAC+	12.		
5. *Toxicodendron diversilobum*	S	UPL	13.		
6. *Artemisia douglasiana*	H	FACW	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 83%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: >16 (in.)

Depth to Saturated Soil >16 (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Above the OHWM

SOILS Plot ID: DR4B

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16+		10YR 3/3			Sand, cobble, rock

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/20/2005
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: DR5A
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: DR5
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Platanus racemosa*	S	FACW	10.		
3. *Carex* sp.	H	varies	11.		
4. *Equisetum* sp.	H	FACW -FAC	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): Al least 75%, probably 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: __N/A_ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below OHWM. Rock dike along channel

SOILS Plot ID: DR5A

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Rocky, no pit dug. Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/20/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Central Coast cottonwood-sycamore riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: DR5B

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: DR5

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Populus balsamifera* ssp. *trichocarpa*	T	FACW	10.		
3. *Salix* sp.	T	OBL-FACW	11.		
4. *Genista monspessulana*	S	UPL	12.		
5. *Rubus ursinus*	S	FAC+	13.		
6. *Baccharis pilularis*	S	UPL	14.		
7. *Leymus triticoides*	H	FAC+	15.		
8. *Torilis arvensis*	H	UPL	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 62%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: __N/A__ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Above OHWM

SOILS Plot ID: DR5B

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Rock and boulders – no pit dug. Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CB1A
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CB1
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Rubus ursinus*	S	FAC+	10.		
2. *Cyperus eragrostis*	H	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☐ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below OHWM

SOILS Plot ID: CB1A

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

CB1B is upslope from CB1A

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Central Coast cottonwood-sycamore riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CB1B

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CB1

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Populus balsamifera* ssp. *trichocarpa*	T	FACW	9.		
2. *Salix* sp.	S	OBL-FACW	10.		
3. *Baccharis pilularis*	S	UPL	11.		
4. *Rubus ursinus*	S	FAC+	12.		
5. *Artemisia douglasiana*	H	FACW	13.		
6. *Bromus madritensis* ssp. *rubens*	H	NI	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 83%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☒ Other
☐ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Appears to be above the OHWM, but some scattered water-borne detritus

SOILS Plot ID: CB1B

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

CB1B is upslope from CB1A

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CB2A
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CB2
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Carex* sp.	H	varies	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM

SOILS Plot ID: CB2A

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Rocky, no pit dug

Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 7/19/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Ruth Sundermeyer State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Central Coast cottonwood-sycamore riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CB2B

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CB2

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Aesculus californica*	T	UPL	9.		
2. *Platanus racemosa*	T	FACW	10.		
3. *Umbellularia californica*	T	FAC	11.		
4. *Toxicodendron diversilobum*	S	UPL	12.		
5. *Torilis arvensis*	H	UPL	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 20%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: __N/A__ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Above the OHWM

SOILS Plot ID: CB2B

Map Unit Name
(Series and Phase) Psamments and fluvents Drainage Class: Excessive
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Mapped type is a hydric soil, according to Monterey County Hydric Soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Arroyo Willow Series

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: SC1

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: SC1

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salix lasiolepis*	T	FACW	9.		
2. *Salix* sp.	T	OBL-FACW	10.		
3. *Scirpus microcarpus*	H	OBL	11.		
4. *Eleocharis* sp.	H	OBL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: __N/A__ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil __<11__ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☒ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☒ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM

SOILS Plot ID: SC1

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-11					sand

Hydric Soil Indicators:

____ Histosol	____ Concretions
____ Histic Epipedon	____ High Organic Content in Surface Layer in Sandy Soils
____ Sulfidic Odor	____ Organic Streaking in Sandy Soils
____ Aquic Moisture Regime	____ Listed on Local Hydric Soils List
____ Reducing Conditions	____ Listed on National Hydric Soils List
____ Gleyed or Low-Chroma Colors	____ Other (Explain in Remarks)

Remarks:

Based on observations made in July 2005, this area was inundated for an extended period during the growing season. The substrate is probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes)	No	(Circle)	(Circle)
Wetland Hydrology Present?	(Yes)	No		
Hydric Soils Present? (assumed)	(Yes)	No	Is this Sampling Point Within a Wetland?	(Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Freshwater marsh

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: SC2

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: SC2

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Polypogon monspeliensis*	H	FACW+	9.		
2. *Cyperus eragrostis*	H	FACW	10.		
3. *Salix* sp.	S	OBL-FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil 0 (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☒ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM

SOILS Plot ID: SC2

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Based on observations made in July 2005, this area was inundated for an extended period during the growing season. The substrate is probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (assumed) (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Arroyo Willow Series

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: SC3

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: SC3

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Eleocharis* sp.	H	OBL	9.		
2. *Salix* sp.	S	OBL-FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil 0 (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☒ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM

SOILS Plot ID: SC3

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

____ Histosol
____ Histic Epipedon
____ Sulfidic Odor
____ Aquic Moisture Regime
____ Reducing Conditions
____ Gleyed or Low-Chroma Colors
____ Concretions
____ High Organic Content in Surface Layer in Sandy Soils
____ Organic Streaking in Sandy Soils
____ Listed on Local Hydric Soils List
____ Listed on National Hydric Soils List
____ Other (Explain in Remarks)

Remarks:

Based on observations made in July 2005, this area was inundated for an extended period during the growing season. The substrate is probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (assumed) (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Arroyo Willow Series

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: SC4

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: SC4

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Scirpus microcarpus*	H	OBL	9.		
2. *Alnus rhombifolia*	T	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil 0 (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☒ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below OHWM

SOILS Plot ID: SC4

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

Remarks:

Based on observations made in July 2005, this area was inundated for an extended period during the growing season. The substrate is probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (assumed) (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Arroyo Willow Series

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: SC5

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: SC5

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salix lasiolepis*	T	FACW	9.		
2. *Salix* sp.	T	OBL -FACW	10.		
3. *Scirpus microcarpus*	H	OBL	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM

SOILS Plot ID: SC5

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

____ Histosol
____ Histic Epipedon
____ Sulfidic Odor
____ Aquic Moisture Regime
____ Reducing Conditions
____ Gleyed or Low-Chroma Colors
____ Concretions
____ High Organic Content in Surface Layer in Sandy Soils
____ Organic Streaking in Sandy Soils
____ Listed on Local Hydric Soils List
____ Listed on National Hydric Soils List
____ Other (Explain in Remarks)

Remarks:

Based on observations made in July 2005, this area was inundated for an extended period during the growing season. The substrate is probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (assumed) (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Freshwater marsh

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: SC6

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: SC6

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Scirpus* sp. (tule-type)	H	OBL	9.		
2. *Alnus rhombifolia*	T	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: 0-12 (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil 0 (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☒ Inundated
☒ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM

SOILS Plot ID: SC6

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

____ Histosol	____ Concretions
____ Histic Epipedon	____ High Organic Content in Surface Layer in Sandy Soils
____ Sulfidic Odor	____ Organic Streaking in Sandy Soils
____ Aquic Moisture Regime	____ Listed on Local Hydric Soils List
____ Reducing Conditions	____ Listed on National Hydric Soils List
____ Gleyed or Low-Chroma Colors	____ Other (Explain in Remarks)

Remarks:

Based on observations made in July 2005, this area was inundated for an extended period during the growing season. The substrate is probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (assumed) (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Arroyo Willow Series

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CRW1

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CRW1

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salix lasiolepis*	T	FACW	9.		
2. *Scirpus acutus var. occidentalis*	H	OBL	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: 8 (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☒ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks:

SOILS Plot ID: CRW1

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

____ Histosol	____ Concretions
____ Histic Epipedon	____ High Organic Content in Surface Layer in Sandy Soils
____ Sulfidic Odor	____ Organic Streaking in Sandy Soils
____ Aquic Moisture Regime	____ Listed on Local Hydric Soils List
____ Reducing Conditions	____ Listed on National Hydric Soils List
____ Gleyed or Low-Chroma Colors	____ Other (Explain in Remarks)

Remarks:

Based on observations made in July 2005, this area was inundated for an extended period during the growing season. The substrate is probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	(Circle)
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present? (assumed)	(Yes) No	
		(Circle)
Is this Sampling Point Within a Wetland?	(Yes) No	

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Arroyo Willow Series

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CRW2

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CRW2

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salix* sp.	T	OBL-FACW	9.		
2. *Eleocharis* sp.	H	OBL	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: 2-3 (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☒ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM

SOILS Plot ID: CRW2

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

____ Histosol	____ Concretions
____ Histic Epipedon	____ High Organic Content in Surface Layer in Sandy Soils
____ Sulfidic Odor	____ Organic Streaking in Sandy Soils
____ Aquic Moisture Regime	____ Listed on Local Hydric Soils List
____ Reducing Conditions	____ Listed on National Hydric Soils List
____ Gleyed or Low-Chroma Colors	____ Other (Explain in Remarks)

Remarks:

Based on observations made in July 2005, this area was inundated for an extended period during the growing season. The substrate is probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle) Wetland Hydrology Present? (Yes) No Hydric Soils Present? (assumed) (Yes) No	(Circle) Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Gretchen Lebednik and Gina Morimoto State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Freshwater marsh
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CRW3
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CRW3
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Scirpus microcarpus*	H	OBL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-):

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: N/A (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☒ Other (explain in Remarks)

Remarks: Below the OHWM. Based on observations made in July 2005, this area was inundated for an extended period during the growing season. 100% of vegetation is obligate wetland indicator

SOILS Plot ID: CRW3

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

____ Histosol	____ Concretions
____ Histic Epipedon	____ High Organic Content in Surface Layer in Sandy Soils
____ Sulfidic Odor	____ Organic Streaking in Sandy Soils
____ Aquic Moisture Regime	____ Listed on Local Hydric Soils List
____ Reducing Conditions	____ Listed on National Hydric Soils List
____ Gleyed or Low-Chroma Colors	____ Other (Explain in Remarks)

Remarks:

Based on observations made in July 2005, this area was inundated for an extended period during the growing season. The substrate is probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (assumed) (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Freshwater marsh

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CRW4

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CRW4

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Scirpus* sp. (tule)	H	OBL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: 0-8 (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil 0 (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☒ Inundated
☒ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks:

SOILS Plot ID: CRW4

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

____ Histosol	____ Concretions
____ Histic Epipedon	____ High Organic Content in Surface Layer in Sandy Soils
____ Sulfidic Odor	____ Organic Streaking in Sandy Soils
____ Aquic Moisture Regime	____ Listed on Local Hydric Soils List
____ Reducing Conditions	____ Listed on National Hydric Soils List
____ Gleyed or Low-Chroma Colors	____ Other (Explain in Remarks)

Remarks:

Based on observations made in July 2005, this area was inundated for an extended period during the growing season. The substrate is probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (assumed) (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Gretchen Lebednik and Gina Morimoto State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CRW5
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CRW5
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Salix* sp.	T	OBL-FACW	10.		
3. *Carex* sp.	H	varies	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-):

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: __N/A__ (in.)
Depth to Free Water in Pit: __>16__ (in.)
Depth to Saturated Soil __>16__ in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☒ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks:

SOILS Plot ID: CRW5

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10YR 5/4 to 10YR 5/3			sand

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

The substrate is probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? (assumed) Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Gretchen Lebednik and Gina Morimoto State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CRW6
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CRW6
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Salix* sp.	T	OBL-FACW	10.		
3. *Scirpus acutus var. occidentalis*	H	OBL	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☒ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM

SOILS Plot ID: CRW6

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

____ Histosol	____ Concretions
____ Histic Epipedon	____ High Organic Content in Surface Layer in Sandy Soils
____ Sulfidic Odor	____ Organic Streaking in Sandy Soils
____ Aquic Moisture Regime	____ Listed on Local Hydric Soils List
____ Reducing Conditions	____ Listed on National Hydric Soils List
____ Gleyed or Low-Chroma Colors	____ Other (Explain in Remarks)

Remarks:

Based on observations made in July 2005, this area was inundated for an extended period during the growing season. The substrate is probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (assumed) (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☐Yes ☐No Community ID: Freshwater marsh

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☐No Plot ID: CRW7

Is the area a potential Problem Area? ☐Yes ☐No Transect ID: CRW7

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Carex* sp.	H	OBL-FAC	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: Alder canopy on slope above.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☐ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM as indicated by bank cut

SOILS Plot ID: CRW7

Map Unit Name
(Series and Phase) Water Drainage Class: _____

Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

____ Histosol	____ Concretions
____ Histic Epipedon	____ High Organic Content in Surface Layer in Sandy Soils
____ Sulfidic Odor	____ Organic Streaking in Sandy Soils
____ Aquic Moisture Regime	____ Listed on Local Hydric Soils List
____ Reducing Conditions	____ Listed on National Hydric Soils List
____ Gleyed or Low-Chroma Colors	____ Other (Explain in Remarks)

Remarks:

Based on observations made in July 2005, this area was inundated for an extended period during the growing season. The substrate if probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (assumed) (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

Observed from opposite side of channel. At foot of steep bank and inaccessible.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Arroyo Willow Series

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CRW8

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CRW8

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salix* sp.	S	OBL-FACW	9.		
2. *Baccharis salicifolius*	S	FACW	10.		
3. *Typha* sp.	H	OBL	11.		
4. *Polypogon monspeliensis*	H	FACW+	12.		
5. *Scirpus robustus*	H	OBL	13.		
6. *Scirpus microcarpus*	H	OBL	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☒ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below the OHWM. May be backwater area

SOILS Plot ID: CRW8

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

____ Histosol	____ Concretions
____ Histic Epipedon	____ High Organic Content in Surface Layer in Sandy Soils
____ Sulfidic Odor	____ Organic Streaking in Sandy Soils
____ Aquic Moisture Regime	____ Listed on Local Hydric Soils List
____ Reducing Conditions	____ Listed on National Hydric Soils List
____ Gleyed or Low-Chroma Colors	____ Other (Explain in Remarks)

Remarks:

Based on observations made in July 2005, this area was inundated for an extended period during the growing season. The substrate is probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	(Circle)
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present? (assumed)	(Yes) No	
		(Circle)
Is this Sampling Point Within a Wetland?	(Yes) No	

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Gretchen Lebednik and Gina Morimoto State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CRW9
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CRW9
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus rhombifolia*	T	FACW	9.		
2. *Salix* sp.	T	OBL-FACW	10.		
3. *Eleocharis* sp.	H	OBL	11.		
4. *Cyperus* sp.	H	varies	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): At least 75%, probably 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: _N/A_ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil _____ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☒ Drift Lines
☒ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Below OHWM. Appears to be backwater area. Along floodplain bank at edge of old channel.

SOILS Plot ID: CRW9

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

____ Histosol
____ Histic Epipedon
____ Sulfidic Odor
____ Aquic Moisture Regime
____ Reducing Conditions
____ Gleyed or Low-Chroma Colors
____ Concretions
____ High Organic Content in Surface Layer in Sandy Soils
____ Organic Streaking in Sandy Soils
____ Listed on Local Hydric Soils List
____ Listed on National Hydric Soils List
____ Other (Explain in Remarks)

Remarks:

Based on observations made in July 2005, this area was inundated for an extended period during the growing season. The substrate is probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (assumed) (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Arroyo Willow Series

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CRW10

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CRW10

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salix* sp.	T	OBL-FACW	9.		
2. *Scirpus acutus var. occidentalis*	H	OBL	10.		
3. *Juncus* sp.	H	varies	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): At least 67%, probably 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: 0-8 (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil 0 (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☒ Inundated
☒ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Edge of pool in side arm of reservoir floodplain.

SOILS Plot ID: CRW10

Map Unit Name
(Series and Phase) Water Drainage Class: _____

Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

____ Histosol	____ Concretions
____ Histic Epipedon	____ High Organic Content in Surface Layer in Sandy Soils
____ Sulfidic Odor	____ Organic Streaking in Sandy Soils
____ Aquic Moisture Regime	____ Listed on Local Hydric Soils List
____ Reducing Conditions	____ Listed on National Hydric Soils List
____ Gleyed or Low-Chroma Colors	____ Other (Explain in Remarks)

Remarks:

The substrate if probably psamments and fluvents, although it is mapped as water, due to the historical maximum water level for the San Clemente Reservoir.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	(Circle)
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present? (assumed)	(Yes) No	
		(Circle)
Is this Sampling Point Within a Wetland?	(Yes) No	

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Arroyo Willow Series

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CRW11A

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CRW11

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salix* sp.	T	OBL-FACW	9.		
2. *Scirpus microcarpus*	H	OBL	10.		
2. *Euthamia occidentalis*	H	OBL	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-):

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: __N/A__ (in.)

Depth to Free Water in Pit: __>16__ (in.)

Depth to Saturated Soil __>16__ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 8/9/2005

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Gretchen Lebednik and Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Arroyo Willow Series

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: CRW11B

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: CRW11

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salix lasiolepis*	S	FACW	9.		
2. *Baccharis pilularis*	S	UPL	10.		
3. *Carex* sp.	H	OBL-FAC	11.		
4. *Artemisia douglasiana*	H	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 75%

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other
☒ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: >16 (in.)

Depth to Saturated Soil >16 (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☒ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks:

Map Unit Name
(Series and Phase) Rock outcrop-xerorthent association Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10YR 3/2	none		

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

Remarks:

The substrate is probably psamments and fluvents.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

SOILS Plot ID: CRW11A

Map Unit Name
(Series and Phase) Rock outcrop-xerorthent association Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10YR 5/3			sand

Hydric Soil Indicators:

____ Histosol	____ Concretions
____ Histic Epipedon	____ High Organic Content in Surface Layer in Sandy Soils
____ Sulfidic Odor	____ Organic Streaking in Sandy Soils
____ Aquic Moisture Regime	____ Listed on Local Hydric Soils List
____ Reducing Conditions	____ Listed on National Hydric Soils List
____ Gleyed or Low-Chroma Colors	____ Other (Explain in Remarks)

Remarks:
No sand-specific indicators of hydric conditions.
The substrate may be psamments and fluvents.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 2/27/06
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Keven Ann Colgate, Gina Morimoto State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: SITE 1
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TR1 – PIT A
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Carex sp. *	H	FACW	7.		
2. Alnus rhombifolia	T	FACW	8.		
3. Rubus ursinus	S	FAC+	9.		
4.			10.		
5.			11.		
6.			12.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: *No flower, cannot key to species. Likely *Carex barbarae* (FACW).

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
☐ Other
☐ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: __N/A__ (in.)
Depth to Free Water in Pit: __N/A__ (in.)
Depth to Saturated Soil __N/A__ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☒ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Backwater area on the right bank (west bank). Indicators of flow include cut banks, drift, etc. Photo right bank facing upstream #101-0007.

SOILS Plot ID: SITE 1-TR1-PIT A

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-17	-	10 YR 3/2	NA	NA	fine loamy sand

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

No hydric indicators

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 2/27/06

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Keven Ann Colgate, Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Freshwater marsh

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: SITE 2

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TR1-PIT A

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Cyperus* sp. *or Scirpus* sp.*	H	FAC-OBL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: *No flower, cannot key to species. Based on inundated habitat this species is an indicator hydric status. Vegetation is only in small patches. Appears to be just beginning to re-colonize the area

.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
☐ Other
☐ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: 2 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soil 0 (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☒ Saturated in upper 12 inches
☒ Water Marks
☐ Drift Lines
☒ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Soil pit filled with water. Photo 008 and 009.

SOILS Plot ID: SITE 2-TR1-PIT A

Map Unit Name
(Series and Phase) Water Drainage Class: _____

Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16	-	5 Y 3/1	NA	NA	FINE SAND

Hydric Soil Indicators:

____ Histosol	____ Concretions
____ Histic Epipedon	____ High Organic Content in Surface Layer in Sandy Soils
____ Sulfidic Odor	____ Organic Streaking in Sandy Soils
____ Aquic Moisture Regime	____ Listed on Local Hydric Soils List
____ Reducing Conditions	____ Listed on National Hydric Soils List
____ Gleyed or Low-Chroma Colors	____ Other (Explain in Remarks)

Remarks:

Orange colored iron-like precipitate on soil surface and floating on water surface.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

Site is a ponded backwater area.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 2/27/06

Applicant/Owner: California-American Water Company County: Monterey

Investigator: Keven Ann Colgate, Gina Morimoto State: California

Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest

Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: SITE 2

Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TR1-PIT B

(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Rubus ursinus	H	FAC+	9.		
2. Alnus rhombifolia	T	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
☐ Other
☐ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: N/A (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soil 0 (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☒ Saturated in upper 12 inches
☒ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Site is located on the edge of the backwater area, just within OHWM. Cut bank indicates hydrology.

Map Unit Name
(Series and Phase) Water Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16	-	2.5 Y 4/2	NA	NA	FINE SAND

Hydric Soil Indicators:

____ Histosol	____ Concretions
____ Histic Epipedon	____ High Organic Content in Surface Layer in Sandy Soils
____ Sulfidic Odor	____ Organic Streaking in Sandy Soils
____ Aquic Moisture Regime	____ Listed on Local Hydric Soils List
____ Reducing Conditions	____ Listed on National Hydric Soils List
____ Gleyed or Low-Chroma Colors	____ Other (Explain in Remarks)

Remarks:

No hydric soil indicators.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

Site is a ponded backwater area.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 2/28/06
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Keven Ann Colgate, Gina Morimoto State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: SITE 3
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TR1 – PIT A
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Carex* sp.*	H	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: *No flower, cannot key to species. Likely *Carex barbarae* (FACW).

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
☐ Other
☐ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: __N/A__ (in.)
Depth to Free Water in Pit: __N/A__ (in.)
Depth to Saturated Soil __N/A__ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☒ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Site is very similar to SITE 1 – PIT A. Pit is on the bank of the Carmel River within the OHWM. Hydric indicators are related to stream flow.

Map Unit Name
(Series and Phase) Junipero-Sur complex Drainage Class: well drained to somewhat excessively drained

Taxonomy (Subgroup): Pachic Ultic Haploxerolls - Entic Haploxerolls

Field Observations
Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16	-	10 YR 4/3	N/A	N/A	fine-medium sand

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

No hydric indicators. Soil is very sandy and well drained. Top layer is a thick organic layer composed of alder leaf litter, and organic detritus (drift, etc.).

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 2/28/06
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Keven Ann Colgate, Gina Morimoto State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: Freshwater marsh
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: SITE 4
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TR1 – PIT A
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Typha* sp.		OBL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: * No flower, cannot key to species. Likely *Typha angustifolia* (narrow leaved cattail)

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
☐ Other
☐ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: 6 (in.)
Depth to Free Water in Pit: 0 (in.)
Depth to Saturated Soil 0 (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☒ Inundated
☒ Saturated in upper 12 inches
☒ Water Marks
☒ Drift Lines
☒ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: Ponded backwater area.

Map Unit Name
(Series and Phase) Junipero-Sur complex Drainage Class: well drained to somewhat excessively drained

Taxonomy (Subgroup): Pachic Ultic Haploxerolls - Entic Haploxerolls

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

Remarks:

Site is inundated and vegetated with obligate indicator species - no soil pit excavated.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

Is this Sampling Point Within a Wetland? (Yes) No (Circle)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project/Site: San Clemente Dam Seismic Safety Project Date: 2/28/06
Applicant/Owner: California-American Water Company County: Monterey
Investigator: Keven Ann Colgate, Gina Morimoto State: California
Do Normal Circumstances exist on the site? ☒Yes ☐No Community ID: White alder riparian forest
Is the site significantly disturbed (Atypical Situation)? ☐Yes ☒No Plot ID: SITE 4
Is the area a potential Problem Area? ☐Yes ☒No Transect ID: TR1 – PIT B
(If needed, explain on reverse side.)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Alnus rhombifolia	T	FACW	9.		
2. Salix lasiolepis	T	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: Riparian woodland on mid-channel bar.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
☐ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
☐ Other
☐ No Recorded Data Available

FIELD OBSERVATIONS:

Depth of Surface Water: ___NA___ (in.)
Depth to Free Water in Pit: ___NA___ (in.)
Depth to Saturated Soil ___NA___ (in.)

WETLAND HYDROLOGY INDICATORS:

Primary Indicators:
☐ Inundated
☐ Saturated in upper 12 inches
☒ Water Marks
☒ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
☐ Oxidized root channels in upper 12 inches
☐ Water-stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (explain in Remarks)

Remarks: On edge of mid-channel bar within OHWM on left bank of Carmel River. Indicators of hydrology are related to flow.

Map Unit Name
(Series and Phase) Junipero-Sur complex Drainage Class: well drained to somewhat excessively drained

Taxonomy (Subgroup): Pachic Ultic Haploxerolls - Entic Haploxerolls Field Observations Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16	-	10 YR 4/3	NA	NA	fine-medium sand

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

Remarks:

No hydric indicators. Soil is very sandy and well drained. Top layer is a thick organic layer composed of alder leaf litter, and organic detritus (drift, etc.). Very similar to SITE 3 TR1 PIT A

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

Appendix X

AIR QUALITY CALCULATIONS

Emissions Summary

Estimated Daily Access Road Construction Emissions						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	lbs/day	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**
Sleepy Hollow Route	0.43	0.00	0.10	0.01	0.01	16
Cachagua Route	0.53	0.00	0.13	0.01	0.01	20
Tularcitos Route	0.41	0.00	0.10	0.01	0.01	15
Typical	**0.46**	**0.00**	**0.11**	**0.01**	**0.01**	**17**

Estimated Annual Access Road Construction Emissions						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	tons/yr	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**
Sleepy Hollow Route	0.02	0.00	0.01	0.00	0.00	0.8
Cachagua Route	0.03	0.00	0.01	0.00	0.00	1.0
Tularcitos Route	0.02	0.00	0.00	0.00	0.00	0.7
Typical	**0.02**	**0.00**	**0.01**	**0.00**	**0.00**	**0.8**

Prime. Estimated Daily Project Construction Emissions - Thicken & desilt						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	lbs/day	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**
Site 4R	13	0	1	0	0	386
Dam Site	430	0	523	25	62	322
Totals	**443**	**0**	**524**	**25**	**62**	**708**

Prime. Estimated Annual Project Construction Emissions - Thicken & desilt						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	tons/yr	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**
Site 4R	1	0	0	0	0	19
Dam Site	54	0	66	3	8	23
Totals	**55**	**0**	**66**	**3**	**8**	**42**

Alternative 1. Estimated Daily Project Construction Emissions - Notch & desilt						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	lbs/day	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**
Site 4R	9	0	1	0	0	254
Dam Site	233	0	285	13	34	164
Totals	**241**	**0**	**286**	**13**	**34**	**419**

Alternative 1. Estimated Annual Project Construction Emissions - Notch & desilt						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	tons/yr	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**
Site 4R	0	0	0	0	0	13
Dam Site	35	0	43	2	5	25
Totals	**35**	**0**	**43**	**2**	**5**	**37**

Emissions Summary

Alternative 2. Estimated Daily Project Construction Emissions - Demo & desilt						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	lbs/day	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**
Site 4R	26	0	2	0	1	763
Dam Site	699	1	856	40	101	494
Totals	**725**	**1**	**858**	**40**	**101**	**1257**

Alternative 2. Estimated Annual Project Construction Emissions - Demo & desilt						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	tons/yr	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**
Site 4R	1	0	0	0	0	38
Dam Site	105	0	128	6	15	74
Totals	**106**	**0**	**128**	**6**	**15**	**112**

Alternative 3. Estimated Daily Project Construction Emissions - Demo & stabilize						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	lbs/day	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**
Site 4R						
Dam Site	465	0	570	27	67	329
Totals	**465**	**0**	**570**	**27**	**67**	**329**

Alternative 3. Estimated Annual Project Construction Emissions - Demo & stabilize						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	tons/yr	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**
Site 4R						
Dam Site	70	0	86	4	10	49
Totals	**70**	**0**	**86**	**4**	**10**	**49**

Project Option	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	lbs/day	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**
Significance Threshold	**137**	**150**	**550**	**82**	**137**	**82**
Proposed Project	443	0	524	25	62	708
Alternative 1	241	0	286	13	34	419
Alternative 2	725	1	858	40	101	1257
Alternative 3	465	0	570	27	67	329
Alternative 4	0	0	0	0	0	0

Emissions Summary

Estimated Daily Access Road Construction Emissions						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	lbs/day	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**
Sleepy Hollow Route	0.43	0.00	0.10	0.01	0.01	16
Cachagua Route	0.53	0.00	0.13	0.01	0.01	20
Totals	**0.96**	**0.00**	**0.23**	**0.02**	**0.03**	**36**

Estimated Annual Access Road Construction Emissions						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	tons/yr	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**
Sleepy Hollow Route	0.02	0.00	0.01	0.00	0.00	0.8
Cachagua Route	0.03	0.00	0.01	0.00	0.00	1.0
Totals	**0.05**	**0.00**	**0.01**	**0.00**	**0.00**	**1.8**

Prime. Estimated Daily Project Construction Emissions - Thicken & desilt						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	lbs/day	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**
Site 4R	13	0	1	0	0	386
Dam Site	430	0	523	25	62	322
Totals	**443**	**0**	**524**	**25**	**62**	**708**

Prime. Estimated Annual Project Construction Emissions - Thicken & desilt						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	tons/yr	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**
Site 4R	1	0	0	0	0	19
Dam Site	54	0	66	3	8	23
Totals	**55**	**0**	**66**	**3**	**8**	**42**

Alternative 1. Estimated Daily Project Construction Emissions - Notch & desilt						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	lbs/day	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**
Site 4R	9	0	1	0	0	254
Dam Site	233	0	285	13	34	164
Totals	**241**	**0**	**286**	**13**	**34**	**419**

Alternative 1. Estimated Annual Project Construction Emissions - Notch & desilt						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	tons/yr	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**
Site 4R	0	0	0	0	0	13
Dam Site	35	0	43	2	5	25
Totals	**35**	**0**	**43**	**2**	**5**	**37**

Emissions Summary

Alternative 2. Estimated Daily Project Construction Emissions - Demo & desilt						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	lbs/day	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**
Site 4R	26	0	2	0	1	763
Dam Site	699	1	856	40	101	494
Totals	**725**	**1**	**858**	**40**	**101**	**1257**

Alternative 2. Estimated Annual Project Construction Emissions - Demo & desilt						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	tons/yr	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**
Site 4R	1	0	0	0	0	38
Dam Site	105	0	128	6	15	74
Totals	**106**	**0**	**128**	**6**	**15**	**112**

Alternative 3. Estimated Daily Project Construction Emissions - Demo & stabilize						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	lbs/day	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**
Site 4R						
Dam Site	465	0	570	27	67	329
Totals	**465**	**0**	**570**	**27**	**67**	**329**

Alternative 3. Estimated Annual Project Construction Emissions - Demo & stabilize						
Location	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	tons/yr	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**	**tons/yr**
Site 4R						
Dam Site	70	0	86	4	10	49
Totals	**70**	**0**	**86**	**4**	**10**	**49**

Project Option	**NO_X**	**SO_X**	**CO**	**PM_{10}**	**VOC**	**PM_{10F}**
	lbs/day	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**	**lbs/day**
Significance Threshold	**137**	**150**	**550**	**82**	**137**	**82**
Proposed Project	443	0	524	25	62	708
Alternative 1	241	0	286	13	34	419
Alternative 2	725	1	858	40	101	1257
Alternative 3	465	0	570	27	67	329
Alternative 4	0	0	0	0	0	0

Appendix Y

SAN CLEMENTE DAM SEISMIC SAFETY PROJECT
AIR QUALITY CONFORMITY ANALYSIS

APPENDIX Y

SAN CLEMENTE DAM SEISMIC SAFETY PROJECT AIR QUALITY CONFORMITY ANALYSIS

Executive Summary

This analysis supports the Clean Air Act (CAA) conformity determination for the proposed San Clemente Dam Seismic Retrofit Project (Project). The proposed Project would involve thickening of the dam on the downstream side and providing abutment protection. The project would have four alternatives that are discussed briefly in this document. The proposed Project would be a Federal action and is subject to general conformity rules because it would be partially federally funded. The analysis demonstrates that the total NO_X and PM_{10} emissions from construction, while greater than the applicable EPA-defined de minimis level of 100 tons per year, would be less that the 1990 emissions budget when added to the existing and projected levels of emissions from all other sources in the North Central Coast Air Basin (NCCAB). The analysis also indicates that the NO_X and PM_{10} emissions associated with the Project would conform to the applicable requirements of and milestones in the California State Implementation Plan (SIP). Emissions of reactive organic compounds (ROC) from project construction would be de minimis (<100 tons per year). Therefore, ROC emissions from the Project would not interfere with attainment or maintenance or cause or contribute to an exceedance of the National Ambient Air Quality Standards (NAAQS) under the CAA. Pursuant to the emissions and air quality impact estimates given in Section 4.2 of the EIR/EIS, ROC, NO_X, and PM_{10} emissions from the Project would not be regionally significant. A "regionally significant" action is defined as a Federal action for which the direct and indirect emissions of any pollutant represent 10 percent or more of a nonattainment or maintenance area's emissions inventory for that pollutant (Reference: 40 CFR 51.853(I)). The design and content of this conformity analysis is based on the "General Conformity Determination under the Clean Air Act for the Ocean Express Pipeline Project", prepared by Haley & Aldrich, Inc. October 8, 2004.

1.0 Introduction

The proposed Project would consist of thickening the dam on the downstream side and providing abutment protection, particularly on the right abutment (as seen facing downstream). The dam would be thickened by the placement of 50 to 60 cast-in-place concrete blocks, each approximately 50 feet in length and 10 feet in height, on the downstream face of the dam. Each block would be tied to the existing dam structure with reinforced steel dowels. The thickness of the new concrete would be approximately proportional to the original thickness at each location along the dam profile. The 3-mile access road to SCD from Carmel Valley Road would require realignment and improvements to accommodate heavy equipment used for construction activities. Road realignment includes construction of a new access road to provide a better line of sight and to bypass the Sleepy Hollow subdivision.

The Project would include four alternatives, which are as follows: 1) Dam Notching with partial sediment removal; 2) Dam Removal with total sediment removal; 3) Carmel River reroute and Dam Removal with in-place sediment stabilization 4) No project.

Under the Clean Air Act (CAA), a general conformity determination is required for projects that constitute a Federal action that would be undertaken in an ozone maintenance or nonattainment

area for which the emissions of certain air pollutants would exceed applicable threshold rates. The Project would be considered a Federal action because it would be partially federally funded. The Project site would be located within the North Central Coast Air Basin (NCCAB), which is in nonattainment (transitional) with the state 1-hour ozone standard, nonattainment with the state PM_{10} standard, and in maintenance with the Federal 1-hour ozone standard. Therefore, the proposed Project requires a general conformity determination if the estimated actual emissions of nitrogen oxides (NO_X) or reactive organic compounds (ROCs), both ozone precursors, would exceed 100 tons per year (tpy), or if Particulate Matter (PM_{10}) would exceed 100 tpy. (Reference: 40 C.F.R. Part 51.853)

The Project would not involve the construction of any new, or modification of any existing stationary sources of air pollutant emissions. However, the Project would result in emissions of NO_X and ROCs, and PM_{10}, primarily from the temporary use of construction-related equipment and the periodic use of vehicles to transport workers to and from the project site. The NO_X emissions associated primarily with construction of Alternative 2 (dam notching) are estimated to exceed 100 tpy. The ROC emissions also associated primarily with construction of the Project would be below 100 tpy. The PM_{10} emissions associated primarily with construction Alternative 2 are estimated to exceed 100 tpy. Thus, a general conformity determination is required for the proposed Project. The purpose of the conformity determination, generally, is to ensure that the NO_X, ROC and PM_{10} emissions from the Project would not interfere with attainment or maintenance or cause or contribute to an exceedance of the National Ambient Air Quality Standards (NAAQS) under the CAA. Emissions estimates for Alternative 2 are used in this analysis because Alternative 2 would have the highest emissions estimates of any Project alternative.

The following analysis demonstrates that the total NO_X emissions and PM_{10} emissions associated with the Project, when evaluated together with the existing and projected levels of NO_X emissions and PM_{10} emissions from all other sources in the NCCAB, would be significantly lower than the 1990 NO_X and 2000 PM_{10} emissions budgets for the air basin. Due to the lack of data for PM_{10}, the State of California emissions estimate for PM_{10} for the year 2000 is used as the baseline emissions estimate in the analysis instead of 1990. The analysis also indicates that the NO_X emissions and PM_{10} emissions associated with the Project would conform to the applicable requirements of and milestones in the California State Implementation Plan (SIP). Refer to Section 5.3 of this document for the SIP analysis. Therefore no implementation of any additional design, construction or operational measures to address the NO_X and PM_{10} emissions associated with the Project would be necessary.

The ROC emissions associated with the Project would be well below the threshold of 100 tpy and would not be considered regionally significant. Therefore, further review under the general conformity review program is not required for ROC emissions associated with the project.

2.0 Regulatory Background

Under the CAA, each state is required to develop a SIP that specifies how air quality regions within the state will attain and/or maintain compliance with the NAAQS. In California, state law designates the California Air Resources Board (ARB) as the lead agency for all purposes related to the SIP. Section 176(c) of the CAA prohibits Federal entities from taking actions (e.g., funding, licensing, permitting, or approving projects) in NAAQS nonattainment or maintenance areas that do not conform to the SIP for the attainment and maintenance of NAAQS pursuant to Section 110(a) of the CAA. The purposes of a general conformity review are to ensure that federal actions do not interfere with the emissions budgets in the SIPs; ensure actions do not cause or contribute to new violations; and ensure attainment and maintenance of the NAAQS.

The conformity requirement also applies to metropolitan projects, programs, or planning activities. Section 176(c) requires that the administration of such projects, programs, or plans assure conformity with the SIP through an affirmation process, or General Conformity Finding. In November 1993, EPA promulgated two sets of conformity regulations to implement section 176(c) of the CAA – the Transportation Conformity Regulations (applicable to highways and mass transit projects) and the General Conformity Regulations (applicable to all other Federal actions). The requirements under 40 CFR Part 93, Subpart B, apply to states that have not adopted an EPA-approved general conformity review program. State conformity regulations must be consistent with EPA's regulations for state programs (Reference: 40 CFR Part 51 Subpart W). Federal actions for which the associated emissions of criteria air pollutants exceed certain thresholds are subject to the general conformity regulations unless specifically exempt or otherwise covered by the transportation conformity regulations, e.g. actions with de minimis emissions, exempt actions listed in the rule, or actions covered by a Presumed to Conform demonstration (a pre-approved list).

The first step in conducting a general conformity analysis for non-exempt actions is to quantify emissions of nonattainment or maintenance area pollutants from the proposed action and compare those emissions to the applicable de minimis thresholds. The NCCAB is in nonattainment (transitional) with the state 1-hour ozone standard, nonattainment with the state PM_{10} standard, and in maintenance with the Federal 1-hour ozone standard (and in attainment or unclassified for all other criteria air pollutants). Therefore, the applicable de minimis thresholds for NO_X and ROCs (as ozone precursors) are 100 tpy, and the threshold for PM_{10} is 100 tpy.

If emissions of any criteria pollutants of concern would exceed the applicable thresholds, the second step, requiring completion of a general conformity analysis, is triggered. The baseline criterion for determining conformity is whether the total direct and indirect air pollutant emissions associated with the proposed action comply or are consistent with the applicable requirements in the relevant SIP. In addition to meeting the baseline criterion, conformity also must be demonstrated by one of the following criteria: (1) emission increases are included in the SIP; (2) state agrees to include increases in the SIP; (3) in areas without SIPs, no new violations of NAAQS and/or no increase in the frequency/severity of violations; (4) offset emissions increases; and (5) mitigation requirements (Reference: 40 CFR Part 51.858). Emissions must also not be regionally significant, meaning that for a Federal action, the direct and indirect emissions of any pollutant must not represent 10 percent or more of a nonattainment or maintenance area's emissions inventory for that pollutant (Reference: 40 CFR 51.853(I))

Section 176(c) of the CAA and the conformity rules assign primary oversight responsibility for conformity determinations to those Federal agencies that are responsible for issuing the underlying authorizations for the proposed action. The Federal agency is required to provide notice of its draft conformity determination to the appropriate EPA Region, state and local air quality agencies and, if applicable, affected Federal land managers. Notice also must be provided to the agency designated pursuant to section 174 of the CAA and the Metropolitan Planning Organization (MPO). The notice must describe that proposed action, the agency's draft conformity determination and specify that interested parties have 30 days within which to submit written comments on the draft determination. The Federal agency issuing the draft conformity determination must make the draft determination available for review by any person who requests a copy. The Federal agency will then review any comments on the draft conformity determination and address any significant comments in its final conformity determination. Within 30 days of the date on which the Federal agency publishes its final conformity determination, the Federal agency must notify the appropriate EPA Region, state and local air quality agencies and other interested parties, provide public notice of the final conformity determination, and make the comments and responses to comments on the draft

conformity determination available to any person who requests this information. (Reference: 40 CFR Part 51.856)

3.0 Proposed Action

Proposed Project (Dam Thickening)

The proposed seismic retrofit project consists of thickening the dam on the downstream side and providing abutment protection, particularly on the right abutment (as seen facing downstream). The dam would be thickened by the placement of 50 to 60 cast-in-place concrete blocks, each approximately 50 feet in length and 10 feet in height, on the downstream face of the dam. Each block would be tied to the existing dam structure with reinforced steel dowels. The thickness of the new concrete would be approximately proportional to the original thickness at each location along the dam profile. For example, above elevation 465 feet, the dam would be thickened by 80%, ranging from 4.2 to 8.8 feet of concrete added; below elevation 465 feet, 9 feet of concrete would be added.

The 3-mile access road to SCD from Carmel Valley Road would require realignment and improvements to accommodate heavy equipment used for construction activities. Road realignment includes construction of a new access road to provide a better line of sight and to bypass the Sleepy Hollow subdivision. The new road would start at Carmel Valley Road about 800 feet west of San Clemente Drive, cross Tularcitos Creek over a new bridge, and provide access to the proposed staging area and batch plant. The existing road between the staging area and the filter plant would be upgraded and widened.

Detailed descriptions of the proposed constructions are contained in Section 3.2 of the EIR/EIS.

Alternative 1 (Dam Notching with partial sediment removal)

Approximately 1.5 million cubic yards of sediment would be removed in planes approximately parallel to the existing surface of the sediment in the reservoir. This approach would minimize the amount of sediment movement in the winter. In combination with reservoir dewatering and sediment pre-draining activities described below, it would also help maintain the excavation work above the groundwater level for as long as possible. A portion of the original streambed that existed in 1921 would be exposed in the upper reaches of the Carmel River and San Clemente Creek during the second season of sediment removal operations. Excavation of sediment above the water table would be performed using self-loading scrapers or similar self-propelled excavating equipment. The scrapers would transport the material to a central stockpile area within the reservoir area, where the material would be allowed to drain further. The stockpile area would be located at the mouth of the ravine where the sediment disposal site is located.

Following partial sediment removal, San Clemente Dam would be notched to approximately elevation 506 feet in the area of the existing spillway bays would reduce the pressure on the dam sufficiently to avoid catastrophic failure of the dam during a MCE event. Notching to this elevation would also be sufficient to prevent overtopping of the dam during the PMF. Notching would be accomplished by saw-cutting the concrete in large blocks. Approximately 700 cubic yards of concrete would be removed. A large tower crane would be used to remove the sawcut concrete blocks and to place the new concrete at the dam and fish ladder. The crane would be located downstream of the dam in the drained plunge pool to provide adequate access to the dam and fish ladder. The concrete blocks would then be further broken up into pieces of sizes that could be loaded and transported by off-highway trucks to the sediment disposal pile for use in erosion control. A large excavator equipped with a hydraulic hammer would be used to

reduce the size of the concrete blocks as needed. Light blasting may also be used to break up the largest concrete pieces into smaller, more manageable pieces.

The 3-mile access road to SCD from Carmel Valley Road would require realignment and improvements to accommodate heavy equipment used for construction activities. Road realignment includes construction of a new access road to provide a better line of sight and to bypass the Sleepy Hollow subdivision. The new road would start at Carmel Valley Road about 800 feet west of San Clemente Drive, cross Tularcitos Creek over a new bridge, and provide access to the proposed staging area. The existing road between the staging area and the filter plant would be upgraded and widened.

Detailed descriptions of the Alternative 1 constructions are contained in Section 3.2 of the EIR/EIS.

Alternative 2 (Dam Removal with total sediment removal)

Approximately 2.5 million cubic yards of sediment would be removed in planes approximately parallel to the existing surface of the sediment in the reservoir. This approach would minimize the amount of sediment movement in the winter. In combination with reservoir dewatering and sediment pre-draining activities described below, it would also help maintain the excavation work above the groundwater level for as long as possible. A portion of the original streambed that existed in 1921 would be exposed in the upper reaches of the Carmel River and San Clemente Creek during the second season of sediment removal operations. Excavation of sediment above the water table would be performed using self-loading scrapers or similar self-propelled excavating equipment. The scrapers would transport the material to a central stockpile area within the reservoir area, where the material would be allowed to drain further. The stockpile area would be located at the mouth of the ravine where the sediment disposal site is located.

Following total sediment removal, San Clemente Dam would be demolished using explosives. This involves the demolition and removal of about 7,000 to 8,000 cubic yards of concrete from the site. The concrete debris would be further broken up into pieces of sizes that could be loaded and transported by off-highway trucks to the sediment disposal pile for use in erosion control. A truck-mounted crane may be used to drill the holes into the dam and load the explosives. The crane could be located downstream of the dam in the drained plunge pool to provide adequate access to the entire footprint of the dam, from the crest down to the foundation. The crane would also be used to lift out the concrete debris. Large excavators equipped with hydraulic hammers or shears would be used to reduce the size of the concrete debris as needed. Blasting would also be used to break up the largest concrete pieces into smaller, more manageable pieces. The existing fish ladder on the left (west) abutment of the dam would be demolished and removed. The instrument hut near the left abutment would be removed. The dam tender dwelling would be preserved and possibly converted to other uses.

The 3-mile access road to SCD from Carmel Valley Road would require realignment and improvements to accommodate heavy equipment used for construction activities. The existing road between the staging area and the filter plant would be upgraded and widened.

Detailed descriptions of the Alternative 2 are contained in Section 3.2 of the EIR/EIS.

Alternative 3 (Carmel River reroute and Dam Removal with in-place sediment stabilization)

In order to permanently bypass the sediment disposal area on the Carmel River, a diversion channel would be constructed to connect Carmel River to San Clemente Creek. Blasting

operations would be required to remove the large volume of rock between the two reservoir arms. Blasting operations would include clearing and grubbing of the blast area; an explosives magazine established onsite to store explosives; pre-drilling of rock to place explosives; and pre-splitting of rock at the channel boundaries to define the channel geometry. The total blasted volume of rock is estimated at about 145 acre-feet, or about 234,000 cubic yards (MEI, 2005). Most of the blasted rock would be broken into 1-foot pieces or smaller. It is anticipated that minor operations would be required to reduce a small percentage of the blasted rock into 1-foot size and smaller with hoe-rams and similar equipment. A portion of the 1-foot and larger pieces of blasted rock would be separated for use in armoring of the diversion dike face that would be exposed to river flows.

At the conclusion of the diversion and partial sediment removal processes, San Clemente Dam would be demolished using explosives. This involves the demolition and removal of about 7,000 to 8,000 cubic yards of concrete from the site. The concrete debris would be further broken up into pieces of sizes that could be loaded and transported by off-highway trucks to the base of the stabilized slope and sediment disposal pile for use in erosion control. A truck-mounted crane may be used to drill the holes into the dam and load the explosives. The crane could be located downstream of the dam in the drained plunge pool to provide adequate access to the entire footprint of the dam, from the crest down to the foundation. The crane would also be used to lift out the concrete debris. Large excavators equipped with hydraulic hammers or shears would be used to reduce the size of the concrete debris as needed. Light blasting would also be used to break up the largest concrete pieces into smaller, more manageable pieces. The existing fish ladder on the left (west) abutment of the dam would be demolished and removed. The instrument hut near the left abutment would be removed. The dam tender dwelling would be preserved and possibly converted to other uses.

The 3-mile access road to SCD from Carmel Valley Road would require realignment and improvements to accommodate heavy equipment used for construction activities. The existing road between the staging area and the filter plant would be upgraded and widened.

Detailed descriptions of the Alternative 3 constructions are contained in Section 3.2 of the EIR/EIS.

Alternative 4 (No project)

Under the No Project (Action) Alternative, the reinforcement of the dam would not occur and the dam would remain as it is. The fish ladder would be improved under the No Action Alternative. The rate and timing of flow releases into the Carmel River would continue to be negotiated annually with NOAA Fisheries, the CDFG and MPWMD, as long as the reservoir remained operable. Retrofit construction impacts would not occur. The reservoir would fill up with sediment and sediment would eventually flow downstream naturally. Interim dam safety measures would continue under the No Action Alternative. In 2003 DSOD required modifications to SCD to meet interim dam safety requirements.

The 3-mile access road to SCD from Carmel Valley Road would not require realignment and improvements. The existing road between the staging area and the filter plant would not be upgraded and widened.

Detailed descriptions of Alternative 4 constructions are contained in Section 3.2 of the EIR/EIS.

4.0 Estimated Emissions

A general conformity analysis must consider direct and indirect emissions from non-exempt federal actions (or portions thereof). Direct emissions include those emissions of criteria air pollutant(s) or precursors that are caused by and occur at the same time and place as the Federal action (Reference: 40 CFR 51.852). Indirect emissions include those emissions of criteria air pollutant(s) or precursors that are caused by the federal action, but may occur later in time and/or may be further removed in distance from the action itself, although still reasonably foreseeable (Reference: 40 CFR 51.852). Indirect emissions must be included in the emissions estimate only if those emissions are caused by the Federal action and practicably can be controlled by the Federal agency. Indirect emissions typically include emissions from mobile sources and emissions generated by third parties that implement the proposed action.

The direct emissions associated with the Project would include emissions from construction equipment directly related to construction of the Project. Indirect emissions would include motor vehicle emissions associated with workers commuting to and from the job site.

Access road and bridge improvement and construction would result in temporary, short-term emissions of PM_{10} in and around the project area. The primary types of construction activities that would occur in the dam site area under the Proposed Project would be: 1) access road and bridge improvement and construction, 2) plunge pool dewatering, 3) foundation preparation, 4) parapet wall and spillway pier demolition, 5) concrete from construction, and 6) concrete pouring. The use of internal combustion engines in trucks, front loaders, backhoes, bulldozers, and other heavy construction equipment and vehicles, would result in temporary, short-term emissions of NO_X and ROCs. These NO_X, ROC and PM_{10} emissions would be restricted to the construction period for the Project and would terminate once construction was completed.

Refer to the Ambient Air Quality Analysis in Section 4.2 of the EIR/EIS for emissions estimates and calculations for each alternative.

5.0 Conformity Determination

5.1 Applicability Analysis

Total emissions of pollutants of concern from construction activities associated with the Project are outlined in the Air Quality section of the EIR/EIS (Section 4.2). To determine applicability of the general conformity determination requirements, these emission rates are compared to the applicable de minimis emission rates specified in 40 CFR 51.853(b)(2). For NO_X and ROCs in ozone nonattainment areas located outside an ozone transport region, the applicable emission rates are 100 tpy each for NO_X and ROC. For PM_{10} in a nonattainment area the applicable emission rate is 100 tpy. Since none of the exemptions listed in 40 CFR 51.853(c), (d) or (e) would be applicable to the Project, and the Project would not be presumed to conform in accordance with the requirements and procedures in 40 CFR 51.853(f)-(h), a conformity determination is required for NO_X and PM_{10} emissions from the Project. While NO_X and PM_{10} emissions would exceed the 100 tpy applicability threshold, pursuant to the emissions and air quality impact estimates given in Section 4.2 of the EIR/EIS, NO_X and PM_{10} emissions from the Project would not be regionally significant. A “regionally significant” action is defined as a Federal action for which the direct and indirect emissions of any pollutant represent 10 percent or more of a nonattainment or maintenance area’s emissions inventory for that pollutant (Reference: 40 CFR 51.853(I)).

Although ROC emissions would be well below the 100 tpy applicability threshold, the general conformity applicability analysis must also consider whether the total direct and indirect emissions from a Federal action would be regionally significant. Pursuant to the emissions and air quality impact estimates given in Section 4.2 of the EIR/EIS, ROC emissions from the Project would not be regionally significant and the conformity determination requirements do not apply to ROC emissions from the Project. Refer to Section 4.2 of the EIR/EIS and Appendix G for emission estimates and calculations.

5.2 Consistency with SIP

All general Federal actions subject to a conformity determination must satisfy certain criteria. First, the total direct and indirect emissions from the action must comply or be consistent with all applicable requirements and milestones in the relevant SIP, such as elements identified as part of reasonable further progress schedules, assumptions specified in the attainment or maintenance demonstration, prohibitions, numerical emission limits, and work practice requirements. (Reference: 40 CFR 51.858(c)). The following subsections demonstrate that the Project will comply and be consistent with the applicable requirements and milestones of the California SIP.

5.2.1 Control of Air Pollutant Emissions from Stationary Sources

EPA and the ARB have established requirements for the control of air pollutant emissions from stationary sources. The Project would not involve the construction or operation of any stationary sources of air pollutant emissions. All equipment that would be used in the construction and operation of the Project would be considered non-road or mobile sources. Therefore, the requirements under EPA and ARB regulations for control of air pollutant emissions from stationary sources would not apply to the Project.

5.2.2 Control of Air Pollutant Emissions from Mobile Sources

During the seismic retrofit of the San Clemente Dam contractors would use construction equipment that would result in mobile source emissions of PM_{10}, NO_X, SO_2, CO, PM_{10} fugitive and ROC fugitive. It is anticipated that this equipment would include trucks, front loaders, backhoes, bulldozers, and other heavy construction equipment and vehicles. All construction equipment associated with the Project would comply with all applicable EPA standards.

5.3 Accommodation of Emissions from the Project in SIP Emissions Budget

The NO_X emissions and PM_{10} emissions associated primarily with construction of the Project are estimated to exceed 100 tpy. Thus, a general conformity determination is being completed for the Project.

The ARB is responsible for ensuring compliance with the SIP and determines and documents whether the total direct and indirect emissions from the proposed Federal action would result in an emissions level that, together with all of the NO_X and PM_{10} emissions in the nonattainment area, would exceed the emissions budgets specified for each pollutant in the relevant SIP.

Federally mandated air quality planning is regulated by the Clean Air Act Amendments of 1990 (CAAA). Historically, the NCCAB was classified as a moderate nonattainment area for ozone and either unclassified or attainment for all other pollutants. In 1994 the MBUAPCD submitted a redesignation request (requesting redesignation from nonattainment to attainment) and the

Monterey Bay Unified APCD (MBUAPCD), the Association of Monterey Bay Area Governments (AMBAG) and the San Benito County Council of Governments adopted a Maintenance Plan for the region. The U. S. Environmental Protection Agency approved the redesignation to attainment status in April 1997.

The NCCAB is currently a nonattainment area for the State Ambient Air Quality Standards for ozone and inhalable particulate matter (PM_{10}). The 1991 Air Quality Management Plan for the Monterey Bay Area (AQMP) was the first plan prepared in response to the California Clean Air Act of 1988 (Act) that established specific planning requirements to meet the ozone standard. The Act requires that the AQMP be updated every three years. The 2004 AQMP is the fourth update to the 1991 AQMP with the first three completed in 1994, 1997 and 2000, respectively. The AQMP addresses only attainment of the state ozone standard. Attainment of the PM_{10} standard is addressed in a separate report. The California Clean Air Act also requires the MBUAPCD to prepare and submit a report to ARB summarizing progress in meeting the schedules for developing, adopting or implementing the air pollution control measures contained in the MBUAPCD's plans. The report is due by December 31 of each year and is included in the AQMP.

The NCCAB is in maintenance with the Federal 1-hour ozone standard, which means that the air basin used to be a nonattainment area and is now an attainment area. The NCCAB is under the authority of the MBUAPCD and thus MBUAPCD was required to write a Federal Maintenance Plan in 1994 for ozone. This document still applies today. The MBUAPCD is not required to update the plan but is required to continue monitoring ozone emissions.

Table Y-1 below compares the estimated emission rates for NO_X, PM_{10}, and ROCs from the proposed action Alternative 2 with the EPA-defined de minimis thresholds. The emissions rates from Alternative 2 are used because they would be the highest emissions rates for the proposed Project.

Table Y-1: Comparison of Estimated Emission Rates from Proposed Action with De Minimis Thresholds

Emissions Rates	**NO_X Emissions,** Tons/Year	**PM_{10} Emissions (fugitive and combustion)** Tons/Year	**ROC Emissions** Tons/Year
De Minimis Threshold	100	100	100
Highest Estimated Emission Rate from Proposed Action	106	118	15

Table Y-2 below compares the estimated emission rate of NO_X from the proposed action Alternative 2 with the 2005 projected emission rate in the MBUAPCD maintenance plan and the 1990 base-year emissions budget. The estimated emission rate from the proposed action is significantly lower than the projected and base-year emissions rates. When the estimated emission rate from the proposed action is added to the 2005 projected emissions rate, the result is still significantly lower than the 1990 base-year emissions budget.

Table Y-2: Demonstration of General Conformity of Action NO_X Emissions with SIP Budget

NO_X Emission Rates	**NCCAB NO_X Emissions,** Tons/Day
Estimated Emission Rate from Proposed Action	0.36
2005 Projected Emission Rate in Maintenance Plan	59.00
1990 Base-Year Emissions Budget	95.74

Source: Monterey Bay Unified Air Pollution Control District. 2004 Air Quality Management Plan for the Monterey Bay Region. Fourth Revision to the 1991 AQMP. Chapter 4. September 2004. "ROC" is referred to as "VOC" in the AQMP.

Table Y-3 below compares the estimated emission rate of PM_{10} from the proposed action Alternative 2 with the 2010 projected emission rate for San Joaquin Valley (which is upwind of the project site), the 2005 projected emission rate for the State of California, and the 2000 base-year emissions budget for the State of California. The estimate emission rate for the proposed action is significantly lower than the projected and base-year emission rates. When the estimated emission rate from the proposed action is added to the 2010 projected emissions rate for San Joaquin Valley, the result is still significantly lower than the 2000 base-year emissions budget. Due to lack of data for PM_{10}, projected and base-year emissions for the NCCAB are not included in the analysis.

Table Y-3: Demonstration of General Conformity of Action PM_{10} Emissions with SIP Budget

PM_{10} Emission Rates	**NCCAB PM_{10} Emissions,** Tons/Day
Estimated Emission Rate from Proposed Action	0.63
2010 Projected Emission Rate for San Joaquin Valley	4.5
2005 Projected Emission Rate for California	36
2000 Base-Year Emissions Budget for California	39

Source: Proposed 2003 State and Federal Strategy for California SIP Section II – Mobile Sources. Chapter C – Off-Road Compression-Ignition (Diesel) Engines.

Refer to the Ambient Air Quality Analysis in Section 4.2 of the EIR/EIS for emission estimates and calculations.

This conformity analysis demonstrates that the total direct and indirect air pollutant emissions associated with the proposed action would comply and would be consistent with the applicable requirements in the relevant SIP. In addition to meeting the baseline criterion, conformity is demonstrated by proposed mitigation requirements for NO_X and PM_{10} (Reference: 40 CFR Part 51.858).

Feasible Mitigation Measures (PM_{10})

There are several feasible mitigation measures that address the many sources of PM_{10} during the construction phase of a project (e.g., grading, wind erosion, entrained dust). Common measures include watering, chemical stabilization, or reducing surface wind speeds with windbreaks. Feasible mitigation measures for PM_{10} are identified below.

- Water all active construction areas at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure.
- Prohibit all grading activities during periods of high wind (over 15 mph).
- Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).
- Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed area.
- Haul trucks shall maintain at least 2'0" of freeboard.
- Cover all trucks hauling dirt, sand, or loose materials.
- Plant tree windbreaks on the windward perimeter of construction projects if adjacent to open land.
- Plant vegetative ground cover in disturbed areas as soon as possible.
- Cover inactive storage piles.
- Install wheel washers at the entrance to construction sites for all exiting trucks.
- Pave all roads on construction sites.
- Sweep streets if visible soil material is carried out from the construction site.
- Post a publicly visible sign, which specifies the telephone number and person to contact regarding dust complaints. This person shall respond to complaints and take corrective action within 48 hours. The phone number of the Monterey Bay Unified Air Pollution
- Control District shall be visible to ensure compliance with Rule 402 (Nuisance).
- Limit the area under construction at any one time.

Feasible Mitigation Measures (NO_X)

For some industrial facilities (e.g., quarries, landfills), emissions of NO_X from construction equipment can be mitigated through controls on equipment and activity. This includes limits on the number of vehicles, type of fuel used, hours of daily operation, or duration of use. Feasible mitigation measures for NO_X are identified below.

- Limit the pieces of equipment used at any one time.
- Minimize the use of diesel-powered equipment (i.e., wheeled tractor, wheeled loader, roller) by using gasoline-powered equipment to reduce NO_X emissions.
- Limit the hours of operation for heavy-duty equipment.
- Undertake project during non-zone season.
- Off-site mitigation

6.0 Conclusions

The San Clemente Dam Seismic Retrofit Project would satisfy all of the requirements of a general conformity determination under applicable EPA and ARB regulations. This determination is based on the following factors:

- NCCAB is located in an air quality nonattainment area for ozone and particulate matter. Thus a general conformity analysis must be completed for those federal actions for which the NO_X, ROC, and PM_{10} emissions would exceed applicable emissions thresholds.

- Total direct and indirect ROC emissions from the Project would be de minimis and would not be regionally significant. Thus estimated ROC emissions from the proposed Project are presumed to conform with the California SIP.

- Total direct and indirect NO_X and PM_{10} emissions from the Project are estimated to exceed 100 tpy applicability threshold, requiring a general conformity analysis of NO_X and PM_{10} emissions associated with the Project.

- Potential emissions sources that would be utilized in construction of the Project comply or are consistent with all applicable requirements and milestones in the California SIP. All sources associated with the Project would be considered non-road or mobile sources, none of which would be subject to the requirements under EPA or ARB regulations for control of air pollutant emissions from stationary sources.

- The Total NCCAB NO_X emissions rate (conservatively estimated by adding estimated Project emissions to the projected 2005 emissions) would be well below the 1990 base-year NO_X budget for the NCCAB.

- The Total regional PM_{10} emissions rate (conservatively estimated by adding estimated Project emissions to the projected 2005 emissions) would be well below the 2000 base-year PM_{10} budget for the State of California.

- Other mitigating factors support the conformity determination. Emissions from the Project would be temporary and diffuse, occurring only during construction period of the seismic retrofit.

7.0 References

40 CFR Part 51, Subpart W – *Determining Conformity of General Federal Actions to State of Federal Implementation Plans.*

Haley & Aldrich, Inc. AES Ocean Express LLC. *General Conformity Determination under the Clean Air Act for the Ocean Express Pipeline Project*. October 8, 2004.

Monterey Bay Unified Air Pollution Control District. 2004 Air Quality Management Plan for the Monterey Bay Region. Fourth Revision to the 1991 Air Quality Management Plan for the Monterey Bay Region. September 2004.

Proposed 2003 State and Federal Strategy for California SIP Section II – Mobile Sources. Chapter C – Off-Road Compression-Ignition (Diesel) Engines.

Rule 702. General Conformity. Adopted October 20, 1994

Appendix Z

FIRE PREVENTION AND SUPPRESSION PLAN

San Clemente Dam Seismic Retrofit Project

Fire Prevention and Suppression Plan

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FIRE PREVENTION AND SUPPRESSION PLAN

1. INTRODUCTION

The Fire Prevention and Suppression Plan (Plan) identifies measures to be taken by the California-American Water Company (CAW) and its contractors (Contractor) to ensure that fire prevention and suppression techniques are carried out in accordance with federal, state, and local regulations. Measures identified in this Plan apply to work within the project area defined as the construction area, access roads, all work and storage areas, and other areas used during construction of the project.

2. PURPOSE

The risk of fire danger during pipeline construction is related to smoking, refueling activities, operating vehicles and other equipment off roadways, welding activities, and the use of explosive materials and flammable liquids. During pipeline operation, risk of fire is primarily from unauthorized entry into the construction area. During maintenance operations, risk of fire is from vehicles and pipeline maintenance activities that require welding.

This Plan establishes standards and practices that will minimize the risk of fire danger and, in case of fire, provide for immediate suppression.

3. RESPONSIBILITIES AND COORDINATION

This Plan will be implemented by CAW and the Contractor on the project. CAW and the Contractor have the responsibility for providing all necessary fire-fighting equipment on the project site to their respective employees, and operating under the requirements of this Plan. Prior to construction, CAW will contact the appropriate authorities to establish communications, obtain permits (if applicable), and/or fulfill other obligations as directed by fire control authorities. In addition to the above, CAW will:

- Ensure that prevention, detection, pre-suppression, and suppression activities are in accordance with this Plan and federal, state, and county laws, ordinances, and regulations pertaining to fire;

- Accompany agency representatives on fire tool and equipment inspections and take corrective action upon notification of any fire protection requirements that are not in compliance; and

The fire prevention and suppression measures described in this Plan will be in effect from the start of construction to the end of construction. These restrictions may change by advance written notice by fire control authorities. However, required tools and equipment will be kept in serviceable condition and be immediately available for fire suppression at all times.

4. FIRE PREVENTION MEASURES

4.1 Preconstruction and Construction

Methods and procedures that will be implemented prior to and during the construction period to minimize the risk of fire are described below.

4.1.1 Training

The Contractor will train all personnel about the measures to take in the event of a fire. The Contractor also will inform each construction crewmember of fire dangers, locations of extinguishers and equipment, and individual responsibilities for fire prevention and suppression during regular safety briefings. Smoking and fire rules also will be discussed with the Contractor and all field personnel during the project's environmental training program.

4.1.2 Smoking

Smoking is prohibited except in areas cleared and graded a minimum of 10 feet in diameter to mineral soil. All burning tobacco and matches will be extinguished before discarding. Smoking also is prohibited while operating equipment or vehicles, except in enclosed cabs or vehicles.

4.1.3 Spark Arresters

During construction, operation, maintenance, and termination of the ROW, all equipment operating with an internal combustion engine will be equipped with federally approved spark arresters. Spark arresters are not required on trucks, buses, and passenger vehicles (excluding motorcycles) that are equipped with an unaltered muffler or on diesel engines equipped with a turbocharger. Agency fire prevention officers will have full authority to inspect spark arresters on project equipment prior to its use on the project on federal lands and periodically during the construction project.

4.1.4 Parking, Vehicle operation, and Storage Areas

In no case will motorized equipment, including worker transportation vehicles, be driven or parked outside of the designated and approved work limits. Equipment parking areas, the construction area, staging areas, designated vehicle-parking areas, and small stationary engine sites, where permitted, will be cleared of all flammable material. Clearing will extend a minimum of 10 feet beyond the edge of the area to be occupied, but not beyond the boundaries of the approved project area, extra workspace, or ancillary site. Glass containers will not be used to store gasoline or other flammables.

4.1.5 Equipment

All motor vehicles and equipment will carry at least one long-handled (48-inch minimum), round-point shovel and one dry chemical fire extinguisher (5 B.C.). Individuals using power saws and grinders will have a shovel as described above, and an 8-ounce capacity fire extinguisher immediately available. All equipment will be kept in a serviceable condition and readily available.

4.1.6 Road Closures

The Contractor will notify the appropriate fire suppression agency of the scheduled closures prior to the open-cut crossing of a road. If required, the Contractor will construct a bypass prior to the open-cut installation of a road crossing, unless a convenient detour can be established on existing project approved roads or within project approved work limits. All bypasses will be clearly marked by the Contractor. During road closures the Contractor will designate one person, who knows the bypass, to direct traffic. The Contractor will minimize, to the extent possible, the duration of road closures.

4.1.7 Refueling

Fuel trucks will have a large fire extinguisher charged with the appropriate chemical to control electrical and gas fires. The extinguisher will be a minimum size 35-pound capacity with a minimum 30 B.C. rating. Power saw refueling will be done in an area that has first been cleared of material that could catch fire.

4.1.8 Burning

No burning of slash, brush, stumps, trash, explosives storage boxes, or other project debris will be permitted on the project. No lunch or warming fires or barbecue grills will be allowed.

4.1.9 Fire Guard

The Contractor will designate a Fire Guard on each construction crew prior to the start of construction activities each day. The Fire Guard must be physically able, vigilant, and suitably trained to detect fires and use required fire-fighting equipment, according to the requirements specified in the Construction Safety Manual (Appendix L). An alternate or back-up Fire Guard will be designated to assume responsibility, if the primary guard is unable to perform their duties. The Contractor will provide, if required by CAW, additional fire watch-people with radio communication to the Fire Guard should construction activities be too widely spread for one Fire Guard to manage effectively.

4.1.10 Fire Guard Communications

The Fire Guard will be responsible for maintaining contact with fire control agencies, and will be equipped with a radio or cellular telephone so immediate contact with local fire control agencies can be made. If cellular telephone coverage is not available, the Fire Guard will use the Contractor's frequency to contact their radio base at the Contractor's yard. From there, yard personnel will telephone emergency dispatch.

4.1.11 Welding

One 5-gallon backpack pump will be required with each welding unit in addition to the standard fire equipment required in all vehicles. All equipment will be kept in a serviceable condition and readily available.

4.1.12 Restricted Operations

The Contractor will restrict or cease operations on federal lands during periods of high fire danger at the direction of the BLM Fire Management Officer. Restrictions may vary from stopping certain operations at a given time to stopping all operations. CAW may obtain approval to continue some or all operations if acceptable precautions are implemented.

The responsible BLM Fire Management Officer will notify CAW the previous day if fire danger predictions call for restrictions the following day. If a sudden change in fire danger requires restrictions during the day, the BLM Fire Management Officer will notify CAW immediately. CAW will then notify the Contractor to restrict activities as soon as possible.

4.1.13 Monitoring

Construction and Environmental Inspectors for CAW will inspect the job site and the Contractor's operations for compliance with all provisions of this Plan. In addition, federal, state, and local fire control agencies may perform inspections in areas under their jurisdiction at their discretion.

4.2 Dam Operation

During dam operation, the risk of fire danger is minimal. The primary causes of fire in the dam vicinity would result from unauthorized entry by individuals utilizing the area for recreational purposes and from fires started outside of the dam vicinity. During operation, access to the dam site would be restricted, in accordance with jurisdictional agency or landowner requirements.

4.3 Dam Maintenance

During maintenance operations, CAW or its Contractor will equip personnel with basic fire-fighting equipment including fire extinguishers and shovels as described in Section 4.1.5, Equipment. Maintenance crews also will carry emergency response/fire control contact phone numbers.

5. FIRE SUPPRESSION

5.1 Suppression

The Contractor will take the following actions should a fire occur within the project area during construction.

- Take immediate action to suppress fires using all available manpower and equipment.
- Notify the Fire Guard.
- Immediately notify the nearest fire suppression agency of the fire location, action taken, and status (See Section 6.2).
- Immediately notify CAW of the fire location and action taken.
- Relinquish the Fire Guard’s direction of fire suppression activities to agency fire management officers upon their arrival.

Note: If required, personnel only may leave the construction area boundaries to accomplish fire suppression. Heavy equipment is not to leave the construction area to suppress a fire unless directed by a BLM Representative on federal lands or by the state or local fire officials on private and state lands.

If a reported fire is controlled, the Fire Guard will note the location and monitor the progress in extinguishing the fire. The Fire Guard, or their designee, will remain at the fire scene until it is fully extinguished. The extinguished fire will be monitored in accordance with procedures described in Section 5.2 below.

When requested by the BLM Fire Management Officer, the Contractor will make any equipment and personnel currently at the site temporarily available for fighting fires in the vicinity of the project. Payment for such services will be made at rates determined by the BLM Fire Management Officer.

5.2 Monitoring

The Contractor will mark the location and boundaries of all extinguished fires. The extinguished fire site will be monitored by the Contractor for a minimum of 24 hours. Monitoring includes walking the fire site perimeter, as well as crossing through the site. The Fire Guard will maintain a log of all extinguished fire locations for future reference.

6. NOTIFICATION

6.1 Notification Procedures

Construction crewmembers will report all fires, whether extinguished or uncontrolled, to the Fire Guard. If the fire is uncontrolled, the Contractor's Fire Guard will call the nearest fire suppression agency (call 911) and the CAW Chief Inspector. Information regarding the location of the fire, property ownership, and closest access roads should be provided to the 911 Operator and CAW.

If a reported fire is controlled, but not extinguished, the Fire Guard will call to notify the nearest police/fire authorities (See Section 6.2) using the non-emergency telephone line to alert them of the situation. The status of the fire will be monitored by the Fire Guard and when extinguished, the nearest fire suppression agency will be notified.

CAW also will immediately contact the nearest landowner(s). CAW will maintain and provide the Contractor with an up-to-date list of landowner and land management agency contacts in the dam vicinity.

Contacts
Emergency contacts are as follows:

Construction	Phone Number	Office Location	BLM Contact
Monterey County	911 831-755-3700	Emergency Number County Sheriffs Office	
San Benito County	911 831-636-4080	Emergency Number County Sheriffs Office	

7. REFERENCES

Bureau of Land Management (BLM). Right-of-Way Plans of Development and Grants, BLM Manual Handbook H-2901-1.

RECORD OF DECISION
for the
FINAL ENVIRONMENTAL IMPACT REPORT/ STATEMENT
for the
San Clemente Dam Seismic Safety Project
(Carmel River Reroute and San Clemente Dam Removal Project)
Carmel Valley, California

Introduction

In compliance with the National Environmental Policy Act (NEPA), a memorandum to the Record has been prepared that adopts the Final Environmental Impact Report/Statement (EIR/S) for San Clemente Dam Seismic Safety Project. The 2008 EIR/S was prepared by the U.S. Army Corps of Engineers (USACE) partnering with the California Department of Water Resources (DWR) to analyze dam strengthening and four alternatives, including dam removal. The project proponent is the dam owner, California American Water. The alternatives were developed to meet DWR Division of Safety of Dams' (DSOD) requirement that San Clemente Dam (SCD) be brought into compliance to withstand loading during a maximum earthquake magnitude (maximum credible earthquake or MCE) and to safely pass a maximum flood event (probable maximum flood or PMF), both specifically outlined in the EIR/S. The adoption memorandum incorporates the analysis developed in the USACE EIR/S as it relates to a proposed action by the National Oceanic and Atmospheric Administration (NOAA) Restoration Center (RC) within the National Marine Fisheries Service (NMFS).

The NMFS proposed action is issuance of a grant (NOAA Grant Award # NA10NMF4630082) to provide funding support for the Carmel River Reroute and San Clemente Dam Removal Project (CRRDR), which is Alternative 3 (including removal of both the San Clemente and the Old Carmel River Dams) and USACE's Preferred Alternative. The NMFS proposed action is directly related to that of the USACE's because NMFS is proposing to fund a portion of the USACE's Preferred Alternative. The environmental effects of the action to fund dam removal and related restoration activities for CRRDR would be expected to have the same environmental effects. Therefore, it is reasonable and prudent for NMFS to adopt the USACE and DWR EIR/S.

Purpose and Need for the USACE and DWR EIR/S

The primary purposes of and needs for the actions are:

1. The basic purpose of the project is to increase dam safety to meet current design standards for withstanding a maximum credible earthquake (MCE) and probable maximum flood (PMF) at SCD, provide fish passage at the dam, maintain a point of diversion to support existing water supply facilities, water rights and services, and minimize financial impacts to California-American Water rate payers.

2. The overall project purpose is to provide a long-term solution to the seismic safety issue associated with SCD; improve fish passage conditions and provide habitat for steelhead in the

Carmel River to the extent feasible; diminish the potential for excessive erosion, undermining, sloughing, or slope failure that would lead to mobilization of sediment from the project to downstream reaches; avoid exacerbating flooding in the 18.5-mile river reach between SCD and the ocean; restore the natural character and function of the valley bottom within the project limits, including a continuum of habitat elements from in-stream features to upland habitat; and restore a more natural sediment transport regime downstream of SCD.

3. The project would address the public and private need for public safety and preservation of natural resources.

Proposed Action for the USACE's and partner's EIS/R

In 2008, USACE and DWR completed the Final EIR/S. In March 2010, California American Water (CAW), the California State Coastal Conservancy (SCC), NMFS, and other partners formally decided to collaborate on pursuing implementation of Alternative 3 (Carmel River Reroute and Dam Removal, CRRDR). CAW filed an updated design application with the DWR's Division of Safety of Dams for construction of Alternative 3, and on March 14, 2011 DWR filed a Notice of Determination for Alternative 3 with the California State Clearinghouse.

Decision to Be Made

Based on NMFS' review of the EIR/S and requests for funding submitted to the NOAA RC by the SCC, NMFS supports the CRRDR as providing a long-term solution to the seismic safety issue associated with SCD, and to improve fish passage conditions and provide habitat for steelhead in the Carmel River to the extent feasible.

Alternatives Considered

The USACE/DWR EIR/S evaluates USACE/DWR's Original Proposed Action (dam strengthening) and three alternatives, as well as a No Action Alternative (a full description of the alternatives can be found at:
http://www.water.ca.gov/publications/browse.cfm?display=topic&pub=120,122,13442,13443.

The Alternatives are:

- USACE/DWR's Original Proposed Action is to strengthen the existing SCD, which is owned and operated by the Coastal Division of the California American Water Company (CAW). The proposed improvements are intended to comply with DWR DSOD requirements to address safety deficiencies and eliminate the risk of failure during a maximum credible earthquake (MCE) or probable maximum flood (PMF) event. USACE/DWR's Original Proposed Action would eliminate safety risks by thickening the downstream face of the SCD with concrete, strengthening the right abutment near the dam crest, modifying the spillway and dam crest to increase effective spillway width, and armoring the abutments with gunite to prevent erosion.

- USACE/DWR's Alternative 1—Dam Notching would eliminate safety risks by notching the SCD to the approximate elevation of 506 feet in the area of the existing

spillway bays. The gates, piers, and walkway at the top of the SCD would be removed. This alternative would reduce mass sufficiently to avoid catastrophic failure of the SCD during a MCE event. Notching to an elevation of 506 feet also would be sufficient to ensure dam safety during a PMF. A new facility to divert water would be constructed upstream of the SCD to replace the existing surface water diversion. Sediment in the reservoir would be removed down to the level of the notch. A new Carmel River channel and San Clemente Creek channel would be reconstructed in a geomorphically stable configuration in the excavated sediments in the reservoir's inundation zone.

- USACE/DWR's Alternative 2—Dam Removal would permanently eliminate safety concerns through the removal of the SCD. The SCD would be demolished and removed from the site. A new facility to divert water would be constructed upstream of the SCD to replace the existing surface water diversion. Approximately 2.4 million cubic yards (1,555 acre feet) of accumulated sediment would be removed over three seasons by excavation with heavy equipment. Sediment would be transported from the reservoir via a conveyor belt system to a disposal area east of San Clemente Reservoir. The historic Carmel River channel and San Clemente Creek exposed by sediment excavation in the reservoir's inundation zone would be reconstructed in their historical valleys.

- USACE/DWR's Alternative 3 (a.k.a. the CRRDR project and USACE/DWR's Preferred Alternative)—Carmel River Reroute and San Clemente Dam Removal (CRRDR) would permanently eliminate safety concerns through the removal of the SCD. The SCD and fish ladder would be demolished and rubble used on site to stabilize the sediment pile. A new facility to divert water would be constructed upstream of the SCD to replace the existing surface water diversion. Approximately 380,000 cubic yards (235 acre feet) of accumulated sediment behind the SCD on the San Clemente Creek arm of the reservoir would be relocated to the Carmel River arm by excavation with heavy earthmoving equipment. A portion of the Carmel River would be permanently bypassed by excavating a 450-foot-long channel through the ridge that separates the Carmel River and San Clemente Creek, approximately 3,000 feet upstream of the SCD. The bypassed portion of the Carmel River would be used as a sediment disposal site for the sediment accumulated in the Carmel River and excavated from the San Clemente Creek arm. The spoils from the bypass channel construction (235,000 cubic yards or 145 acre feet) would be used for construction of a diversion dike at the upstream end of the bypassed reservoir arm. The sediments at the downstream end of the bypassed reservoir arm would be stabilized and protected from erosion. The new Combined Flow Reach between the Reroute Channel and the present dam location will be restored with a focus on steelhead passage. Habitat restoration and re-vegetation will be performed for the Upper Carmel River Reach, Reroute Channel and slopes, Combined Flow Reach, Diversion Dike, Stabilized Sediment Slope, and Sediment Stockpile. The restoration and revegetation components will transition to adjacent habitat.

- USACE/DWR's Alternative 4—The No Action Alternative would leave the SCD in place with all its existing facilities. A new fish ladder would not be constructed, the Old

Carmel River Dam would not be notched, and the sediment would be left in place behind the Dam. The reservoir would continue to accumulate sediment at an average rate of about 16.5 acre feet per year. Minor sediment removal may occur to allow the SCD to maintain the existing surface water supply intake serving the upper Carmel Valley Village area. The existing drawdown ports in the SCD and the existing fish bypass facility would both likely remain operational until the reservoir fills with sediment.

USACE/DWR's Original Proposed Action and action alternatives (Alternatives 1, 2, and 3) include site access and sediment removal, fish passage, and water diversion. USACE/DWR's Original Proposed Action and Alternatives 1, 2, and 3 meet the requirement of increasing the safety of the SCD to meet design criteria for withstanding a MCE and passing a PMF. Alternative 4 does not meet dam safety requirements.

Environmentally Preferable Alternative(s)

The USACE Preferred Alternative is the Carmel River Reroute and San Clemente Dam Removal Project (CRRDR). This is Alternative 3, including removal of both the San Clemente and the Old Carmel River Dams. The CAW has applied to USACE, San Francisco District, for a Department of the Army Permit to remove the San Clemente (SCD) and Old Carmel River Dams (OCRD) and restore riparian habitat and unobstructed fish passage at the confluence of the Carmel River and San Clemente Creek. In addition to removing the two dams, the project would also include rerouting the Carmel River into San Clemente Creek at a location that is approximately 3,000 feet upstream of SCD; the rerouting would bypass the majority of accumulated sediment in the Carmel River.

Sediment that has accumulated in the San Clemente arm of the reservoir would be sequestered by relocating it to a stockpile area on the abandoned reach of the Carmel River upstream of the SCD location and downstream of the reroute channel. The project would permanently remove the seismic risks of dam failure. It would also provide improved passage for steelhead and other fish species, and improve aquatic, riparian, and upland habitats for a variety of species.

The CRRDR involves the following major components and activities:

- Construction / Improvement of Access Roads
- Excavation of the Reroute Channel
- Construction of the diversion dike
- Stabilization of the sediment slope
- Relocation of sediment from sediment slope and San Clemente Creek / Combined Flow Reach to the sediment stockpile
- Channel Restoration
- SCD Removal
- OCRD Removal
- Habitat Restoration and re-vegetation (about 45 to 55 acres)

The Reroute Channel, which would reroute Carmel River flows into the proposed Combined Flow Reach, would be excavated through the drainage divide between the Carmel River and

San Clemente Creek. Upstream of the Reroute Channel, the Upper Carmel River would be partially excavated and restored to transition to existing upstream channel grades. The new Combined Flow Reach between the Reroute Channel and the present dam location would be restored with a focus on steelhead passage. Upstream of the Combined Flow Reach, the Upper San Clemente Creek would also be excavated and restored to transition to existing upstream channel grades.

A portion of the accumulated sediment in the Upper Carmel River Reach and all of the accumulated sediment in the San Clemente Creek arm of the reservoir would be excavated and relocated to the abandoned Carmel River arm, and the sediment in the abandoned Carmel River arm would be stabilized in place to form the sediment stockpile. A diversion dike would be constructed from the excavated sediment of the Reroute Channel, to help guide the Carmel River flow through the Reroute Channel into the San Clemente Creek drainage, and to prevent flow from entering the upstream end of the sediment stockpile (abandoned reservoir). A stabilized sediment slope would be constructed at the downstream end of the abandoned Carmel River arm to retain sediments in the sediment stockpile area.

Habitat restoration and re-vegetation would be performed for the Upper Carmel River Reach, Reroute Channel and slopes, Combined Flow Reach, diversion dike, stabilized sediment slope, and sediment stockpile. The restoration would include transitioning to the limit of construction, impact, and/or existing undisturbed vegetation. When all of the site components are in place, SCD would be removed. In addition, OCRD, located approximately 1,700 feet downstream of SCD, would be removed as part of the project.

Rationale for Selection of the Preferred Alternative

USACE/DWR's Original Proposed Action, which focused on dam strengthening, would have resolved the public safety issues and improved upstream fish passage through construction of a new fish ladder. Both up- and downstream fish passage, however, would still be heavily impaired by the dam, and the dam would continue to disrupt sediment transport and ecological connectivity in the river ecosystem. These impacts could only be addressed by removing the dam. For these reasons, the SCC, NMFS, and the Planning and Conservation League Foundation worked with CAW to develop a feasible approach to implement the Carmel River Reroute and San Clemente Dam Removal (CRRDR) project. The CRRDR project would permanently eliminate safety concerns through the removal of the SCD, as well as eliminate up- and downstream fish passage issues

Although DWR and the USACE indicated in their 2008 EIR/S that the dam safety issue could be addressed through implementation of Alternative 3 (CRRDR), the EIR/S did not identify a Preferred Alternative. USACE did identify Alternative 3 as its Preferred Alternative in their Record of Decision for the Carmel River Reroute and San Clemente Dam Removal Project (USACE 2013). NMFS concurs that CRRDR is the environmentally preferable alternative based on NMFS' mandate to conserve, protect and restore living marine resources, including species listed under the Endangered Species Act. This alternative would meet the goals of the NOAA Community-based Restoration Program to assist coastal communities in restoring fishery and coastal habitat.

Mitigation Measures and Monitoring

Mitigation will be conducted as per the Carmel River Reroute and San Clemente Dam Removal Project Habitat Mitigation and Monitoring Plan for the USACE's Clean Water Act 404 permit, prepared for California American Water by URS Corporation, dated April 2012.

All compensatory mitigation would occur on site as part of the restoration project. No mitigation will occur offsite. The CRRDR project's goals are in part to improve fish passage in the Carmel River, enhance habitat quality, and establish new waters of the U.S., wetland and upland habitats. The project includes many on-site habitat improvements and is considered self-mitigating by the USACE under the Clean Water Act for the following reasons:

- no net loss of wetland;
- 1,738 linear feet of new Waters of the United States would be established through the creation of the reroute channel and drainages on the sediment stockpile;
- 545,200 cubic yards of accumulated sediment would be removed from the reservoir;
- two dams would be removed;
- 6,555 linear feet of riverine/riparian habitat would be restored (combined amount of restored channel includes Carmel River along the Plunge Pool Road, the combined flow reach, the Western Tributary, Upper San Clemente Creek, the reroute channel, and Upper Carmel River). This compares to approximately 3,000 linear feet of riverine/riparian that would be lost due to the rerouting and fill of the Carmel River.

JUL 19 2013

Frederick C. Sutter, Director Office of Habitat Conservation

Date