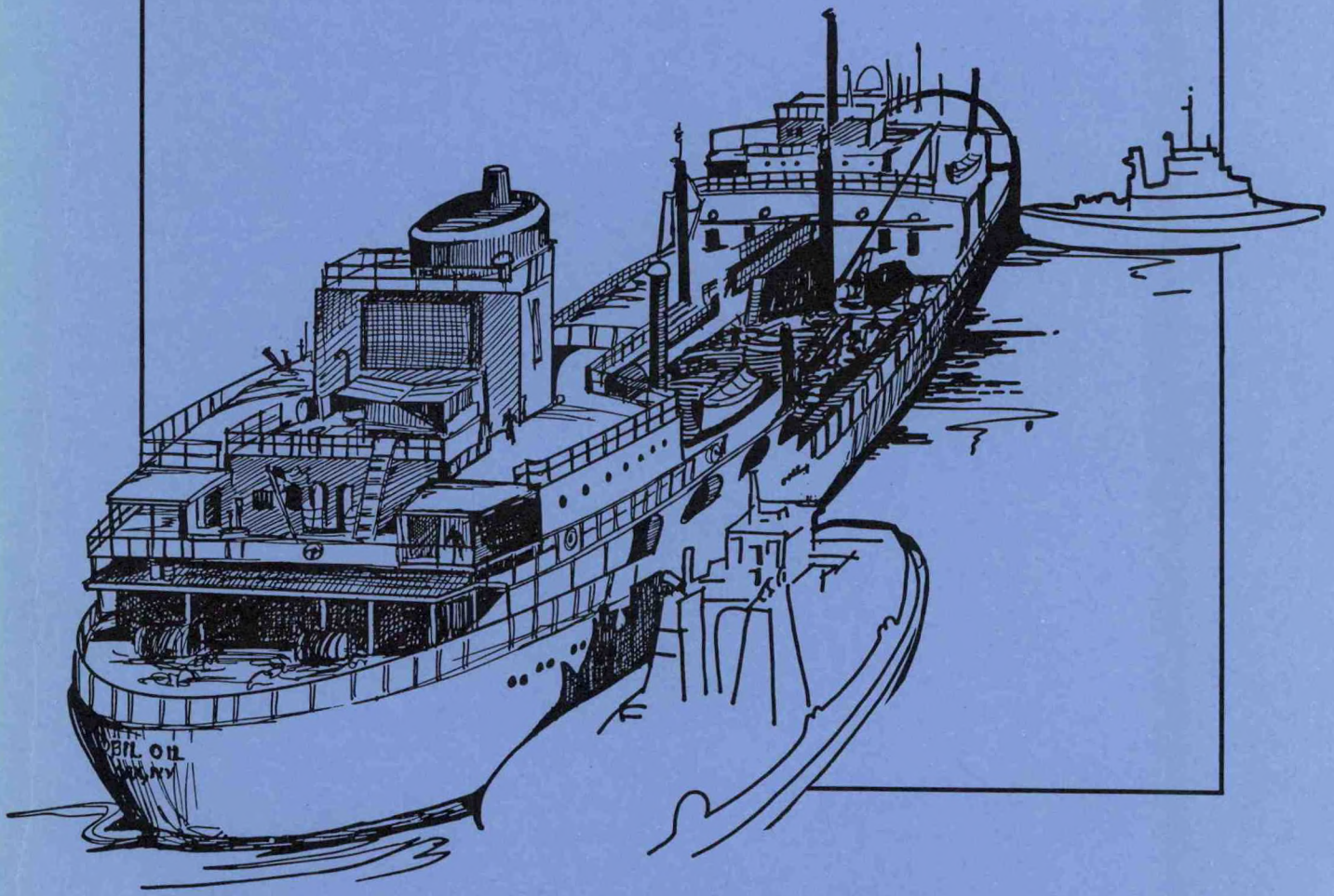
# Fate and Effects Of The Mobiloil Spill In The Columbia River



OCEAN ASSESSMENTS DIVISION
OFFICE OF OCEANOGRAPHY & MARINE ASSESSMENT
NATIONAL OCEAN SERVICE
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION

Submitted To:

Ocean Assessments Division
Office of Oceanography & Marine Services
National Ocean Service
National Oceanic & Atmospheric Administration

# FATE AND EFFECTS OF THE *MOBILOIL* SPILL IN THE COLUMBIA RIVER



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# I. EXECUTIVE SUMMARY

The tank ship MOBILOIL grounded on the Columbia River near St. Helens, Oregon, on 19 March 1984. Damage to tanks resulted in a spill of over 3,900 barrels of heavy crude oil. The National Oceanic and Atmospheric Administration (NOAA) was involved in the response, coordinating federal and state agencies in a fate and effects study. The methodology, detailed in this report, involved biological, chemical, and physical studies. Close communication between field samplers and planners allowed coordination and documentation of the sampling effort.

Due to the weight of the oil, the lack of low molecular weight and water-soluble components, and the volume and current velocity of the river, most of the oil was swept out to sea, then deposited along outer beaches of Washington. Fringe marsh oiling also occurred in the river. Oil on the outer beaches and along the river was either removed by cleanup crews or redeposited farther north.

The most noticeable effect of the oil was on seabirds, with dead birds numbering up to two per mile per day on the outer beaches. Of the 698 treated at a rescue center, 475 (68 percent) were released alive. Oiled fish were also commonly collected. Surfperch, petrale sole, and white sturgeon were collected with oiled mouths. Chemical analysis of white sturgeon tissues indicated uptake of naphthalenes and other hydrocarbons, probably from digestion of oil or oiled food.

The presence of immature and adult salmon in the river at the time of the spill may lead to long-term effects on the fishery. Coho salmon fry were exposed to oil in ponds at the Trojan Nuclear Power Plant, but these appeared healthy in preliminary physiological tests. Chinook salmon fingerlings were held in a Washington state hatchery well beyond the release date until bioassays indicated the waters of the Elochoman Slough area were safe. The effects of the oil on salmon life history (chemical imprinting and spawning) are unknown and will be subject to an ongoing investigation. Other ongoing investigations are being performed by federal and state agencies relative to benthic organisms, shellfish, other fisheries, birds, and mammals.

Past oil-spill impact studies have traditionally required months of preparation to be implemented. This study, while not a detailed environmental assessment, was planned and operational within a few days. The techniques

involved have application in future studies, and NOAA is pursuing and investigating this methodology as a standard operating procedure.

# II. SPILL RESPONSE

## A. EVENT

The tanker ship MOBILOIL grounded near Warrior Rock on the Columbia River (Fig. 1) as the result of a steering failure, after midnight on 19 March 1984. Punctures and gashes up to 100 feet (30 m) and 3 feet (0.9 m) wide were rent in starboard cargo tanks #1 through #5 (Fig. 2). The ship remained stable, but immobile, near Warrior Rock until 26 March.

The 25-year-old MOBILOIL is a 31,760-ton oil tanker with 30 cargo tanks, 10 rows of 3 tanks each (port, center, starboard) (Fig. 2). While enroute from Ferndale (Washington) to Portland (Oregon), the ship had cargo in all tanks except #5 center and #7 port and starboard. Tanks damaged in the grounding contained 28,404 barrels of heavy fuel oils (Table 1). Approximately 200,000 barrels of oil were on board the ship.

Warrior Rock extends out from the Oregon side of the Columbia River between river miles 87 and 88, 12 miles (7.4 km) downriver from Portland. The exact point of grounding was a shallow ledge 300 yards (272 m) south of Warrior Rock on the Oregon side of the shipping channel (Fig. 1). After grounding, the ship lay perpendicular to the current with the bow pointed west; one-third of the ship was on the rocky ledge.

During the days following the grounding, the U.S. Coast Guard (USCG) focused its efforts on monitoring two major areas of activity: vessel salvage and oil cleanup activities. Mobil had accepted responsibility for spill cleanup so a federal spill response was not declared. The USCG maintained the role of reviewing Mobil's proposed response actions and monitoring their activities to insure that an adequate response was taking place.

Mobil's efforts to remove the oil remaining in the damaged cargo tanks were initiated late in the evening of 20 March. By 0200 on 21 March, large-capacity pumps had been connected to #1 and #2 starboard tanks. Four thousand barrels were offloaded from tanks #1 and #2 by 0900. By 1000, cargo was also being removed from tanks #3 and #4. Twenty-two thousand barrels of oil were offloaded by 0940 on 22 March. Early in the afternoon of 22 March, tank #5 was completely offloaded. It was reported that 23,542 barrels of liquid had been removed from the five damaged cargo tanks by 1800 on 22 March (Table 2). Water which entered the damaged tanks made it impossible to determine what proportion of the liquid offloaded

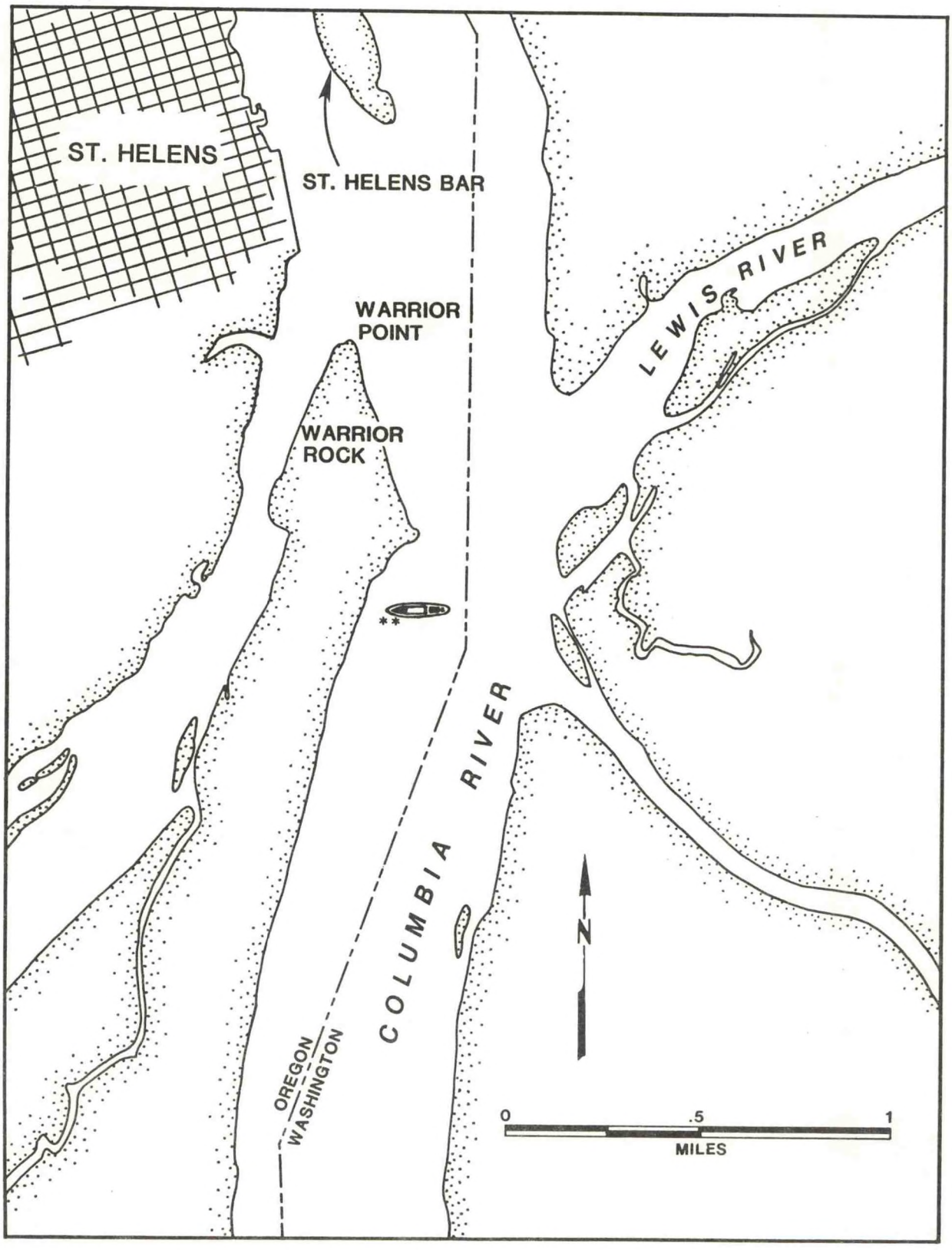


FIGURE 1. MOBILOIL spill site near Warrior Rock, showing position of ship perpendicular to the current and aground. The current flows northward.

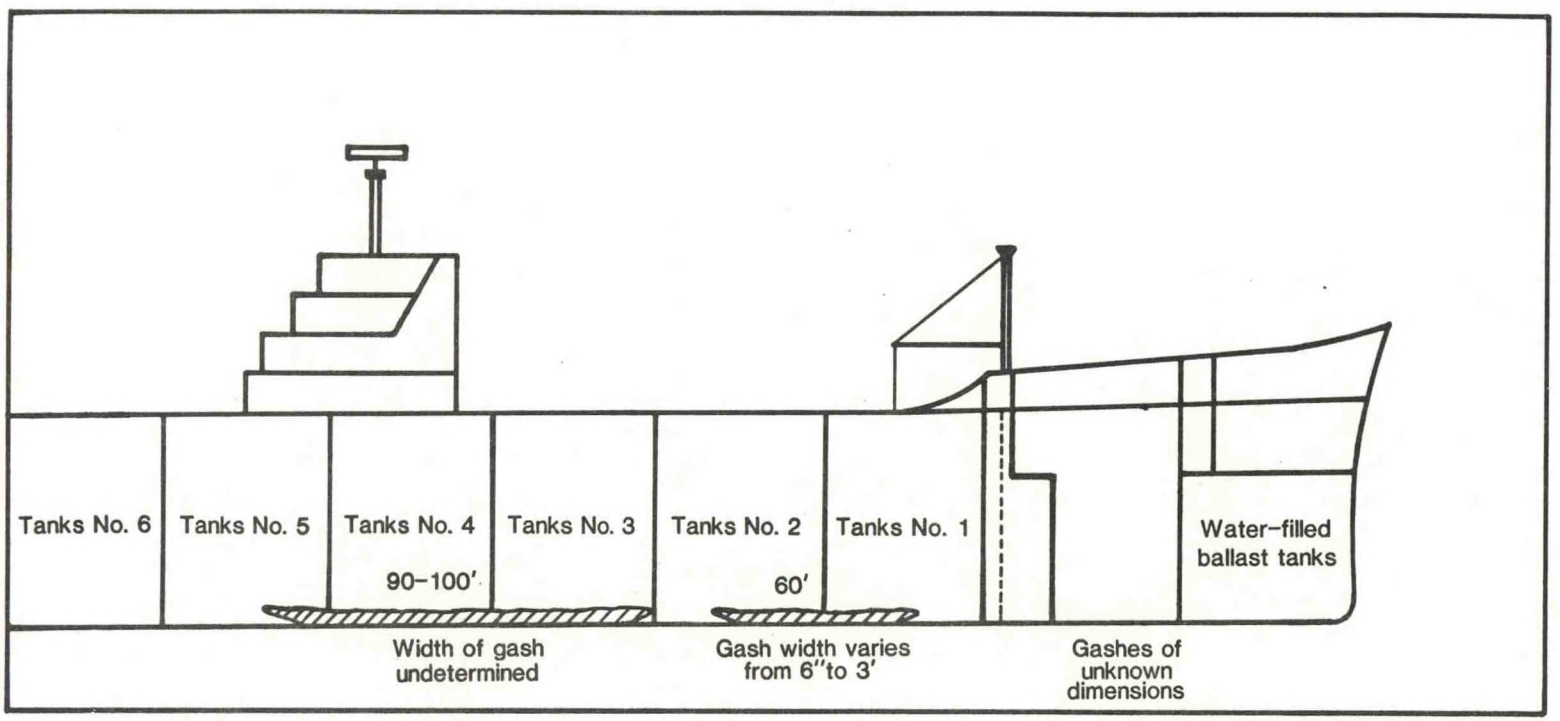


FIGURE 2. Illustration of a portion of the ship and the location of damaged tanks. (Source: U.S. Coast Guard, Portland, Oregon.)

TABLE 1. Cargo contained in damaged tanks at time of 19 March 1984 grounding of the MOBILOIL. (Source: Information supplied by U.S. Coast Guard and Mobil Oil Company.)

| *Tank Number* | *Cargo* | *Specific Gravity* | *Barrels* | *Gallons* | *Pour Point* | *API #* |
|---|---|---|---|---|---|---|
| STBD No. 1 | Heavy residual | 0.99 | 5,312 | 223,104 | 45°F | 11.3 |
| STBD No. 2 | No. 6 fuel oil L.S. | 0.98 | 6,255 | 262,710 | 30°F | 12.6 |
| STBD No. 3 | No. 6 fuel oil L.S. | 0.98 | 4,163 | 174,846 | 30°F | 12.6 |
| STBD No. 4 | Industrial fuel oil | 1.03 | 5,148 | 216,216 | 30°F | 5.5 |
| STBD No. 5 | Heavy residual | 0.99 | 7,526 | 316,092 | 45°F | 11.3 |
| *Total Product Potentially Involved:* | | | *28,404* | *1,192,968* | | |

was oil and what was water. An accounting of liquid transfer provided by Mobil is presented in Table 2.

Mobil continued to offload cargo from undamaged tanks in an effort to refloat the ship. At about 0130 on 26 March, the MOBILOIL swung parallel to the river current. Using tugs and the vessel's own power, the ship was backed off the rock ledge at 0430. By 1630, the MOBILOIL had been moved up the Columbia and Willamette Rivers to Swan Island where it was dry-docked for damage inspection (Fig. 3).

Cleanup of oiled shoreline areas was accomplished by Mobil through Environment Emergency Services (EES). Coordination with EES was accomplished through two field command posts, one at Kalama, Washington (later moved to Longview) and one at Long Beach, Washington. Approximately 3,500 man-days of effort were spent on the cleanup.

Mobil coordinated the bird-cleanup activities by transporting oiled birds to a cleaning center, temporarily located at the Columbian White-tailed Deer National Wildlife Refuge. This center was in operation until 23 April and facilitated the recovery and cleaning of 475 birds.

## B. COORDINATION OF EFFORT

With the number of federal and state agencies having jurisdiction and interest in the Columbia River environment, a coordinated response to this incident was necessary. Therefore, a meeting was called on 23 March in Portland to assure effective use of people and funds. In attendance were representatives from the States of Oregon and Washington, and from the U.S. Department of Interior (DOI), USCG, and NOAA. At this meeting, it was decided that the scope of research needed to assess environmental impact went beyond that necessary for cleanup support. As a result, these agencies agreed to share their information and coordinate their research regarding the fate and effects of the oil. The state agencies and DOI were to continue their biological surveillance and record any incidents of oil impacts on the biota in the river and marine ecosystems affected. NOAA would continue to study the transport and fate of the oil in the environment and would act as the central coordination point for all agencies.

NOAA developed an environmental sampling-plan matrix (described later) to facilitate coordination and to assure that any critical research gaps would be filled by one of the cooperating agencies. This approach was

TABLE 2. Estimated cargo loss resulting from 19 March 1984 MOBILOIL grounding. (Source: Mobil Oil press release, 30 March 1984.)

| | | *Barrels* |
|---|---|---|
| Quantity discharged to barges from ruptured tanks (#1, #2, #3, #4, and #5 starboard) | | 23,542 |
| Oil remaining on top of water in #1, #2, #3, #4, #5 starboard tanks after discharge | | 542 |
| Total oil transferred to #5 center tank from ruptured tanks and #1 and #2 port tanks | | 2,558 |
| | *Subtotal* | *26,642* |
| Oil in #1, #2, #3, #4, and #5 starboard tanks prior to stranding | | (28,404) |
| Oil transferred from #1 and #2 port tanks | | (2,163) |
| | *Estimated Outflow* | *(3,925)* |
| No changes, due to stranding, of quantities in other tanks. | | |

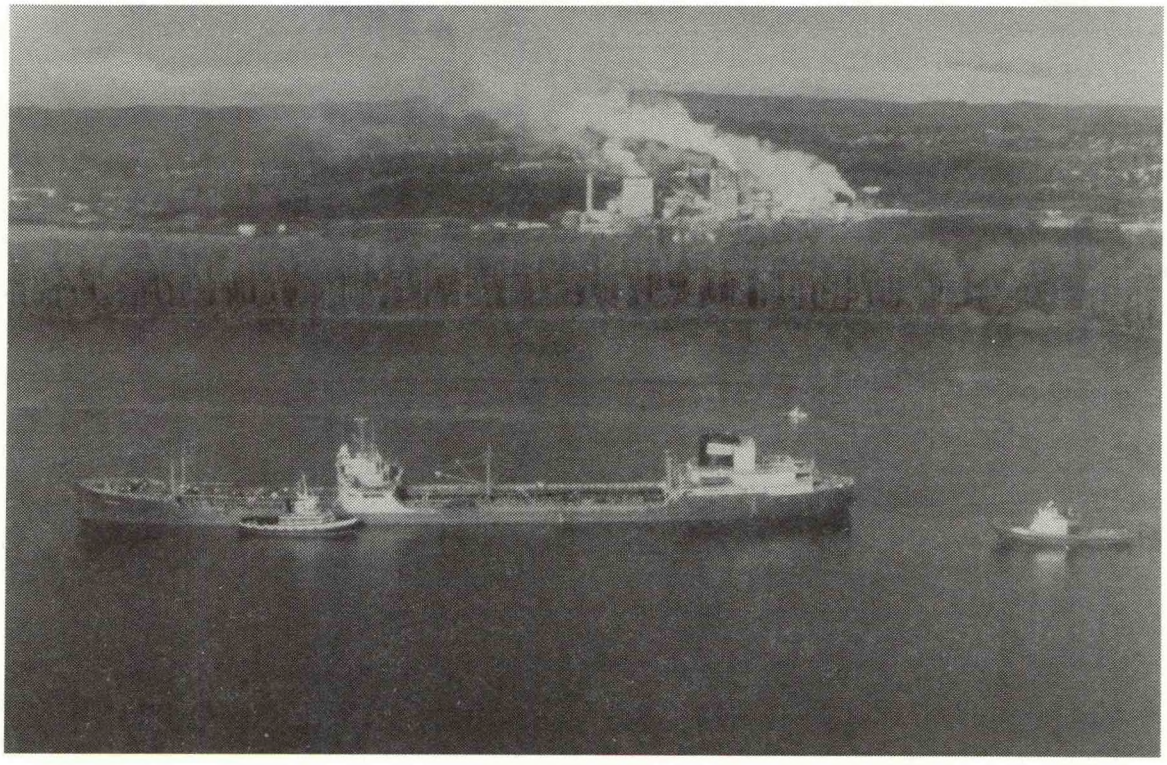

FIGURE 3. Movement of the MOBILOIL following refloating on 26 March 1984.

presented at a meeting of these agencies on 27 March in Battleground, Washington. At this meeting, each agency designated a primary contact point and relayed recently acquired information. Based upon the sensitivity of certain parts of the river and the expected areas of impact, sampling sites were established and agreed upon (Figs. 4 and 5).

This meeting also provided a forum for filling in the sampling-plan matrix and, where necessary, standardizing sampling procedures. Following this meeting, it was agreed that each evening there would be a meeting at the NOAA command post in Astoria, Oregon, that would be attended by each agency contact, either in person or by teleconference.

To track the sampling efforts being conducted by the various agencies, NOAA utilized a computerized sample-tracking system developed for hazardous materials responses. This system allowed the NOAA information management group to immediately begin tracking ongoing fieldwork. Additional personnel worked with the designated agency-contact people to assure that information collected earlier in the event was also included. This retrospective sample tracking was accomplished within a few days of the initial incident to minimize information loss.

Coordination of the NOAA sampling teams with other agencies continued throughout the study. Sampling procedures, equipment selection, sample locations, time schedules, results, and observations were coordinated through the NOAA command post in Astoria to assure that adequate effort was being exerted with a minimum of duplication. Daily meetings held each evening in Astoria, along with constant phone communication, allowed for this close cooperation.

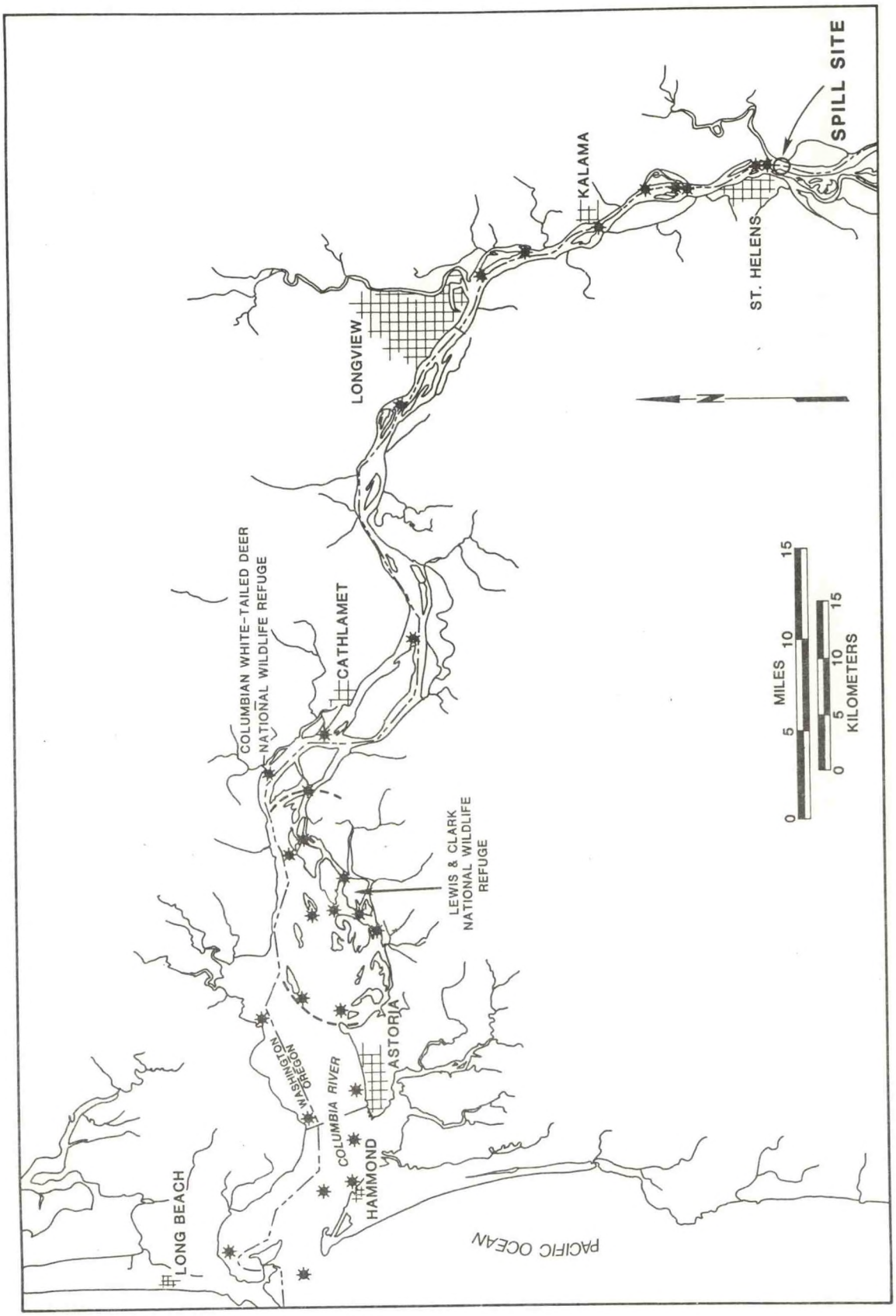


FIGURE 4. Spill site and downriver impact area. Primary study sites are indicated by *.

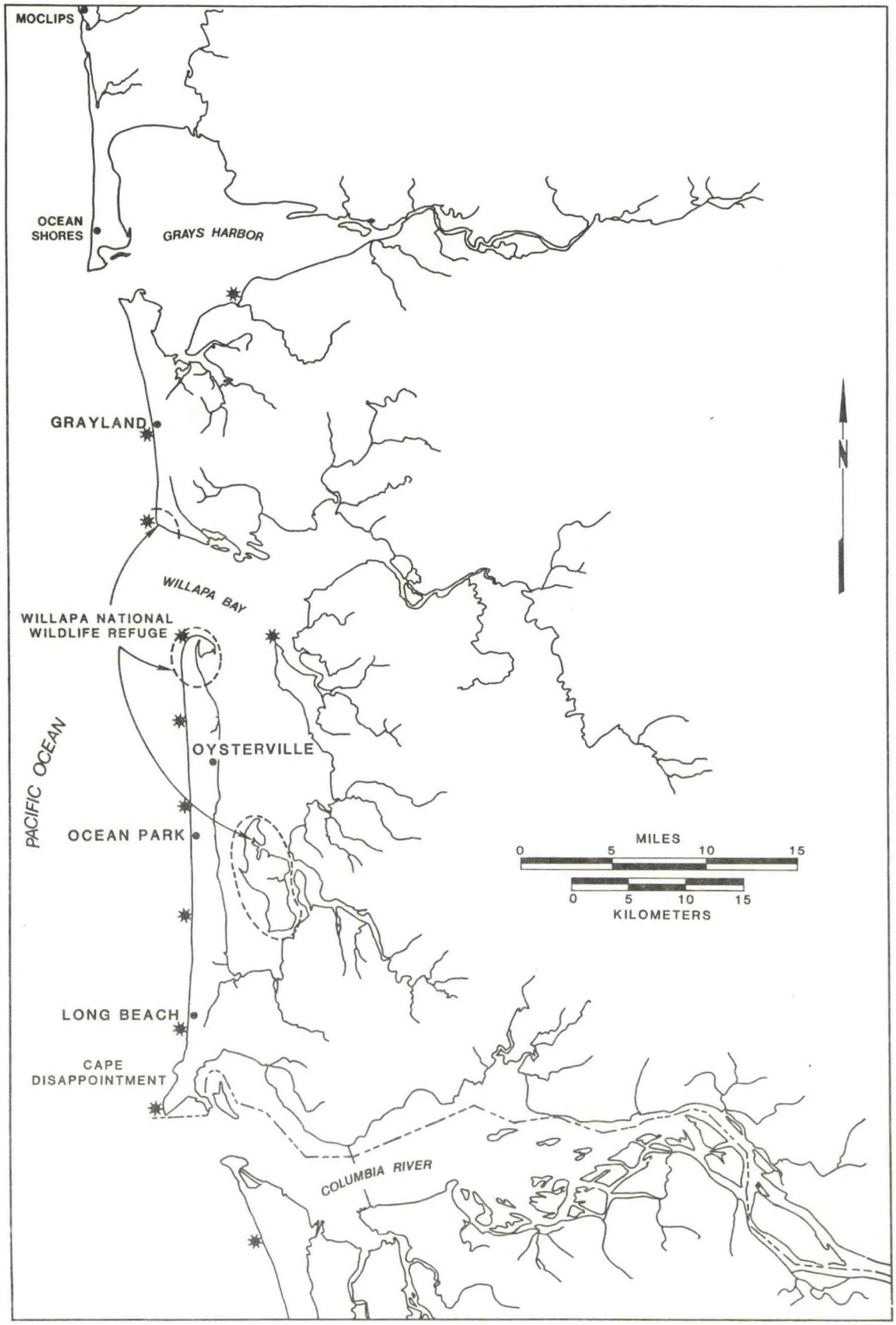


FIGURE 5. Impact area on the Washington and Oregon outer beaches. Primary study sites are indicated by *.

# III. FATE AND EFFECTS PROGRAM

## A. BACKGROUND ON NOAA'S SCIENTIFIC SUPPORT TEAM

The Hazardous Materials Response Branch of NOAA has been established to provide qualified scientific advice to federal On-Scene Coordinators (OSCs) during oil and chemical spills in the marine environment. A Scientific Support Coordinator (SSC) is one member of a group of special forces available upon request to federal OSCs during actual or potential releases of pollutants and prespill contingency planning. During spills, SSCs serve on the OSC's staff to integrate scientific information pertinent to a particular incident and coordinate scientific activity on-scene.

The overall goal of the response program is to provide timely and effective deployment of scientific resources to minimize environmental and socioeconomic impact during an emergency oil or hazardous substance release. The major objectives of the program are:

1) To provide the National Response Team, Regional Response Team, and OSCs with assistance in (a) evaluating imminent hazards to human health and the environment and (b) mitigating or preventing the environmental and socioeconomic impacts of oil and hazardous substance releases.
2) To provide scientific assistance in assessing the environmental and socioeconomic damage resulting from such incidents.
3) To maximize the research advantage offered by the spill situation, especially for improving future response capabilities.

## B. RATIONALE

A program of fate and effects investigation was initiated by NOAA on 23 March 1984. Evidence accumulated over the preceding week strongly suggested that a number of conditions existed which have been prerequisites in the past for the authorization of such studies.

### 1. Substantial Threat to Resources of Trusteeship Interest to NOAA

Additional information suggested that the volume of the spill exceeded the initial Mobil/USCG estimate of 42,000 gallons, perhaps by a considerable margin. It was also clear, from preliminary sampling, that some fraction of the oil, perhaps the bulk of the spill, had become incorporated into the

water column and river bedload sediments, posing a much greater risk to natural resources than would have been the case if oil impacts had been restricted to surface contamination.

There are two resources of primary concern to NOAA that were potentially at risk from the spill. During the March-April period, hatcheries on the Columbia River release several million juvenile salmon into the river system upstream of the spill location. Previous studies have indicated that juvenile salmon are particularly sensitive to oil impact. In addition, there were migrating adult salmon in the river. These facts, coupled with the presence of 600-700 harbor seals protected by NOAA under the Marine Mammal Protection Act, provided a major motivation for NOAA to undertake a close examination of the nature and extent of oil impact.

2. Need for Additional Data to Meet Response Requirements

It was apparent early in the spill response that several decisions affecting river resource management would require detailed information on the quantity and fate of the oil spilled during the incident. The decision to hold salmon in upstream hatcheries would depend on information with which to forecast risks to survival at various release intervals. The possibility of relocating marine mammals, an unpleasant prospect at any time and especially so during the pupping season, might depend on the extent of oil reaching haulout areas. The management of river flow itself could affect not only stability of the vessel, but also the dynamics of oil movement, the availability of water for upriver marshes, and other characteristics of the estuary with resource management implications. These and other management uncertainties provided major impetus for the fate and effects investigation.

3. Existence of Background Information

Fate and effects studies in the past have been hampered by lack of information on natural environmental conditions against which excursions resulting from the spill incident might be compared. The Columbia River, however, is a well-studied system, so considerable data were available to meet study needs. In particular, data were available from the Columbia River Estuary Data Development Program (CREDDP) which were essential to study design and eventual interpretation on analytical measurements (Pacific NW River Basins Commission, 1979-1983).

## C. GENERAL METHODS

### 1. Sample Planning and Coordination

To obtain an overview of the responsibilities and the purposes of sampling at the proposed sites, a chart was produced (Table 3) to allow agencies to see the effort taking place and to determine their roles in the effort based on their resources and interests. A sampling program was then generated which showed the overall effort at each sampling site (Appendix C). This program described the location, sampler, and what was sampled.

### 2. Sampling Execution: NOAA Sampling Efforts

[*A chronology of NOAA sampling efforts is given in Appendix A.*]

One day after the MOBILOIL went aground, the NOAA sampling effort began, spanning the period from 21 March to 9 May 1984. Initially, the program consisted of overflights and ground-truthing along upriver shore areas. This effort was expanded to include water and sediment sampling, additional staff, and use of a NOAA boat and other vehicles beginning on 21 March. Appropriate sampling equipment, administrative supplies, and communications gear, which had been prepackaged and staged for immediate use in a 24-hour accessible area, were transported from Seattle.

On Sunday, 25 March, a command post was established at the U.S. Army Corps of Engineers Field Station in Astoria, Oregon. Field personnel met there that evening, and these evening meetings were continued throughout the sampling period.

The most intensive period of sampling took place between 26 March and 31 March. During this time, 2 charter fishing boats, a NOAA boat, 3 vans, a charter aircraft, and 6 or more NOAA staff sampled the river from St. Helens to the Pacific Ocean, and the ocean beaches from Seaside (Oregon) to Grays Harbor (Washington).

Sampling efforts focused on the water column (water, plankton tow), surface water (sheens, tarballs), river bottom (trawl, sediment grab, sorbent ball), beaches (overflights, ground-truthing), and observation by the local residents and fishermen. Sampling by 5 m otter trawl was the most effective way of covering large areas of the bottom and deeper areas of the river (Fig. 6.). The cod end of the trawl was fitted with a sorbent pad which gathered oil or oiled debris (Fig. 7). The entire pad or a portion of

TABLE 3. Sampling program including agencies, parameters, and sites. Some sites are not shown on the map.

| SAMPLE SITES | PHYSICAL | CHEMICAL | BIOLOGICAL | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Oil Budget | Chemical Monitor | Marine Mammals | Marine Birds | Fisheries | Shellfish | Wetlands | Beaches |
| Cape Disappointment | WDF/NOAA | NOAA/WDF/Parks Dept. | | | | WDF | | WDF/NOAA |
| Long Beach | WDF/NOAA | NOAA/WDF | WDF | NOAA | WDF | WDF | | WDF/NOAA/EPA |
| Ocean Park | WDF/NOAA | NOAA/WDF | WDF | NOAA | WDF | WDF | | WDF/NOAA/EPA |
| Willapa Bay | WDF/NOAA | WDF/NOAA | WDF | NOAA | WDF | WDF | | WDF/NOAA/EPA |
| Grays Harbor | WDF/NOAA | WDF | WDF | | WDF | WDF | | WDF/EPA |
| Fort Canby | | WDOE | WDF | | WDF | | | |
| Beeker Beach | NOAA | WDOE | WDOE | | WDOE | | | |
| Chinook | NOAA | WDOE | | | WDOE | | | |
| Desdemona Sands | NOAA | NOAA | NOAA | | NOAA | | | |
| Astoria Bridge | NOAA | NOAA | | | NOAA | | | |
| Taylor Sands | NOAA | NOAA | | | NOAA | | | |
| Hammond | NOAA | NOAA | | NOAA | | | | |
| Grays Bay | NOAA | NOAA | | | NOAA | | | |
| Rice Island | NOAA | NOAA | | | | | | |
| Miller Sands | NOAA | NOAA | | | | | | |
| Jim Crow Sands | NOAA | NOAA | | | | | | |
| Steamboat Downstream | NOAA/ODEQ/ODFW | NOAA | | DOI | WDF | | NOAA/DOI/ODEQ/ODFW | |
| Steamboat Upstream | NOAA/ODEQ/ODFW | NOAA | | DOI | | | NOAA/DOI/ODEQ/ODFW | |
| Elochoman Downstream | NOAA/ODEQ/ODFW | NOAA/WDF | | | | | NOAA/ODEQ/ODFW | |
| Elochoman Central | NOAA/ODEQ/ODFW | NOAA/WDOE | | | NOAA | | NOAA/ODEQ/ODFW | |
| Elochoman Upstream | NOAA/ODEQ/ODFW | NOAA | | | WDOE | | NOAA/ODEQ/ODFW | |
| St. Helens Shallows | NOAA/EPA/ ODEQ/ODFW | NOAA | | | | | NOAA/ODEQ/ODFW | |
| Mile 85 | NOAA/EPA/ ODEQ/ODFW | NOAA | | | | | ODEQ/ODFW | |
| St. Helens Channel | NOAA/EPA/ ODEQ/ODFW | NOAA | | | | | ODEQ/ODFW | |

DOI = Department of Interior
EPA = Environmental Protection Agency
ODEQ = Oregon Department of Environmental Quality
ODFW = Oregon Department of Fish and Wildlife
WDF = Washington Department of Fisheries
WDOE = Washington Department of Ecology

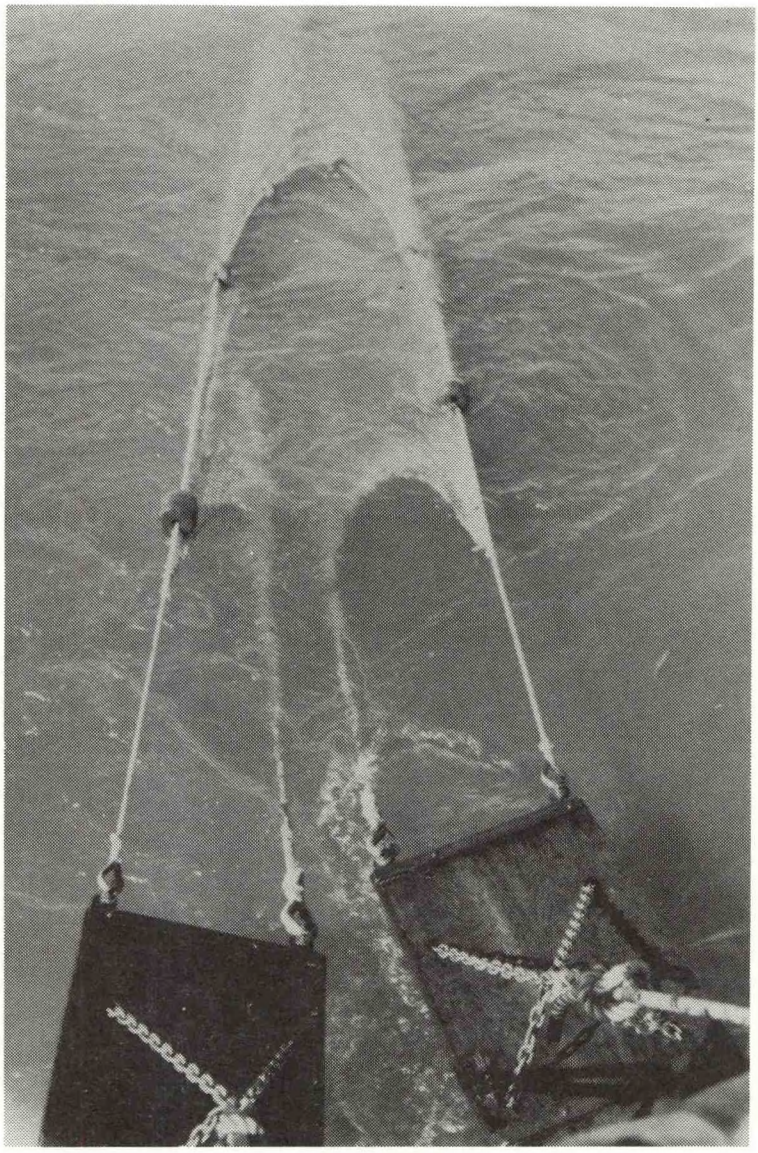

FIGURE 6. Otter trawl for sampling fish and large areas of bottom for oil.

FIGURE 7. Otter trawl collection, including fish, oiled debris, and oiled sorbent pad.

oil was then kept as a sample. The net was washed by dragging it behind the boat, and a new sorbent pad was fitted for the next trawl.

Samples taken followed strict chain-of-custody sample storage and sample collection procedures. Documentation consisted of notes taken in bound fieldbooks by field parties. These notes were supplemented by sample tags and sample-tracking forms. Sample jars and collection devices were initially washed with soap and water, rinsed with water, rinsed with hexane, and sealed with aluminum foil. Samples were then stored in a locked refrigerator with controlled access.

### 3. Sampling Execution: Other Agencies

Details of other agency response are described in Appendix B and by sampling-tracking sheets in Appendix C. As described previously, agencies of the States of Oregon and Washington, as well as federal agencies, participated in this study effort. In general, each agency used its own field procedures and field tagging methods. However, there were specific sampling devices or techniques developed for this particular spill situation, for which the agencies shared expertise and resources to assure compatibility of results. Chain-of-custody sample treatment and tracking techniques established by NOAA were used by all agencies. Field study plans were coordinated between agencies each evening, and any new methods or results discussed.

## D. BIOLOGICAL STUDIES

### 1. Resources at Risk

Information on the natural resources of the Columbia River and outer beaches was obtained from various sources (Beak Consultants, Inc., 1978; Pacific NW River Basins Commission, 1979-1983; Seaman, 1978; Sutherland, 1979; and USFWS, 1981).

The primary concerns relative to resources were based on the habitats, seasons of activity, likelihood of impact, and the organisms themselves. Following is a list of the areas which were determined to be most sensitive during the period of the spill and their criteria for sensitivity (return to Figs. 4 and 5 for Areas #1-#7 and Fig. 5 for Area #8):

1) Baker Bay - Chinook, chum, and coho salmon nursery; feeding and nursery area for dungeness crab and various fishes; waterfowl concentrations; high primary productivity.
2) Desdemona Sands - Harbor seal habitat area; concentrations of juvenile and adult starry flounder and other fishes; benthic organism concentrations.
3) Youngs Bay - Chinook, chum and coho salmon nursery area; feeding area and nursery for dungeness crab and various fishes; benthic organism concentrations.
4) Taylor Sands - Bald eagle feeding area; harbor seal habitat area; benthic organism concentrations.
5) Lewis and Clark National Wildlife Refuge.
   a) Rice Island - Harbor seal habitat area.
   b) Russian and neighboring islands - Bald eagle feeding area; chinook salmon and starry flounder nursery area; harbor seal habitat area; waterfowl feeding; benthic organism concentrations.
   c) Miller and Jim Crow Sands - Harbor seal habitat area; chinook salmon and starry flounder nursery area; waterfowl feeding; benthic organism concentrations.
6) Columbian White-Tailed Deer National Wildlife Refuge.
   a) Steamboat Slough - Waterfowl feeding area.
   b) Elochoman Slough - State fish hatchery; salmon spawning and fingerling habitat.
7) Upriver sites - These included islands and shoreline up to the Warrior Rock spill site near St. Helens. These are areas of waterfowl and fish habitat.
8) Outer beach sites - These included the outer beaches of Oregon and Washington to Grays Harbor. Included in this area were the habitats for marine birds, migrating waterfowl, anadromous fish, shellfish beds (oyster and razor clam), and recreational beaches.

Seasonal aspects, such as bird nesting and fish migration, were taken into account in determining sensitive areas. Certain other areas which contained sensitive habitats were not studied in this detail either because they were not impacted by oil or because they were determined not to be sensitive to oil impacts at the time of the spill.

A list of species present in the area and vulnerable to oiling is presented in Appendix D. Of primary concern were the following:

1) Several hundred harbor seals (mostly pregnant females) along the lower river, with pupping to begin soon.
2) Threatened or endangered species which use the area, including bald eagle, snowy plover, peregrine falcon, and Columbian white-tailed deer.
3) Large number of seabirds and migratory waterfowl in the impact area of the river mouth and outer beaches.
4) Chinook salmon fingerlings scheduled for immediate release from the Washington State Hatchery on Abernathy Creek.
5) Coho salmon fry being cultured by Oregon Department of Fish and Wildlife (ODFW) at the Trojan Nuclear Power Plant in ponds which received noticeable oil from the river.
6) Adult spring chinook salmon runs which were in progress, along with the downstream migration of juveniles.
7) Sportfishery based on large catches of flounder, sturgeon, steelhead, and spring chinook.
8) Commercial longline fishery for sturgeon.
9) Clam and oyster populations on the outer beaches and in Willapa Bay.

## 2. Methods

The data for fate and effects of resources were gathered by the following methods:

1) Field sampling, as described previously.
2) Aerial overflights and ground observations, to locate affected resources.
3) Interviews with fishermen, cannery operators, and agency personnel.
4) Investigation of reports from the public and state agency personnel.
5) Live box studies in Elochoman Slough [96-hr bioassays] of chinook salmon fingerlings followed by a saltwater challenge test [performed by Washington Department of Ecology (WDOE)].

6) Physiological examinations of gills, guts, and other organs of coho salmon fingerlings [performed by Oregon Department of Environment Quality (ODEQ)] at the Trojan Nuclear Power Plant.

7) Chemical analysis of tissues of white sturgeons collected in the river (performed by WDOE).

Detailed information on the methods used by WDOE and ODEQ is not included in this report, but can be obtained by contacting these agencies. Other observations and data in this report are either from NOAA personnel or were verified by NOAA personnel and are included in the sample-tracking sheets (Appendix C).

## 3. Findings

### a) Marine Mammals

A concern during the spill was the effect on health and movement of harbor seals, especially since pupping usually begins in the first week of April. Observations made of seals on Desdemona Sands and upstream, with dead seals being investigated when reported, revealed that the seals were in typical numbers at the Desdemona Sands area, while only two were seen upstream. Observations of two dead seals indicated mortality had occurred prior to the spill, and that injuries from nets or boats were responsible. A dead whale was also reported which was investigated on 27 March. The dead whale was identified as one disposed of prior to the spill and was inadvertently towed to shore.

The cleanup of the shoreline and the short retention of oil in the vicinity of the Columbian White-Tailed Deer National Wildlife Refuge indicated that effects on the deer and furbearing animals would be minimal.

### b) Seabirds and Waterfowl

The most conspicuous effect of the spill was on the coastal birds. As mentioned previously, a process of collection, transport, and treatment was initiated by Mobil Oil utilizing the services of the International Bird Rescue Research Center (Berkeley, California). Birds were captured on outer beaches, on roads, and along the river. Dead or severely weakened birds numbered up to two per mile per day on the outer beaches where they were often mixed in a swash of the marine invertebrate velella (Fig. 8). Dead


FIGURE 8. Oiled, dead bird (western grebe) found on outer beaches and mixed in with velella.

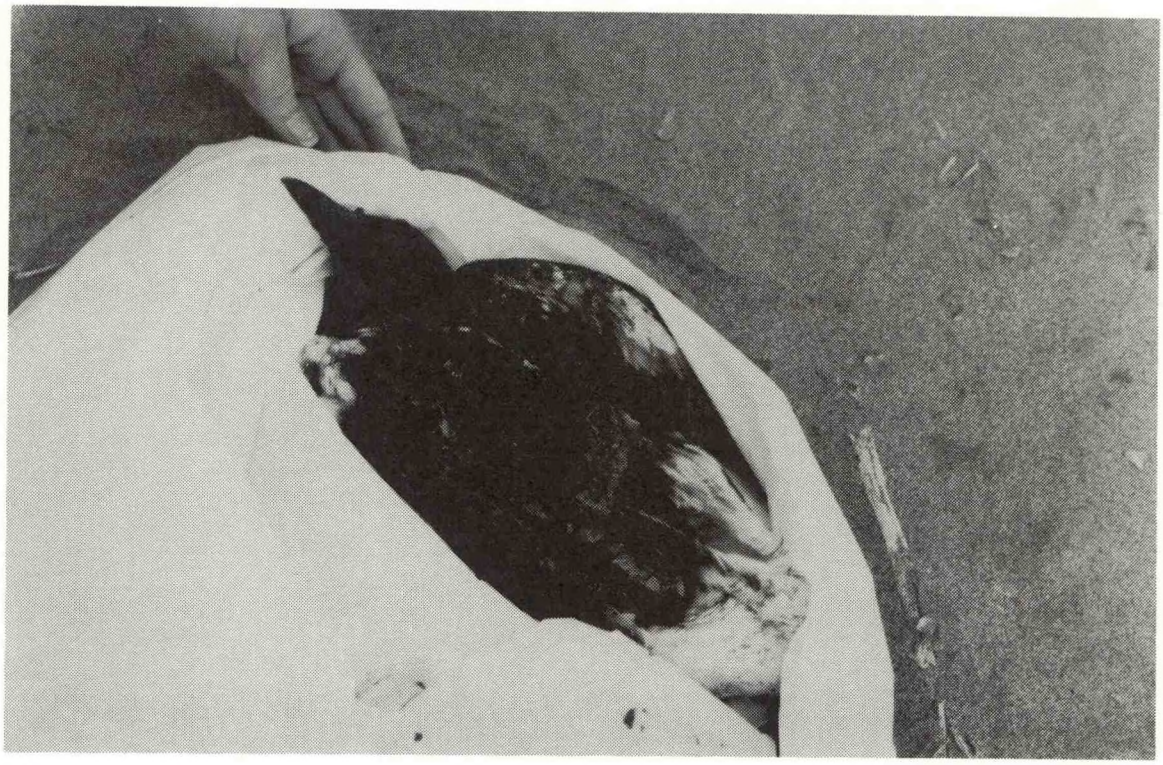

FIGURE 9. Oiled, dead bird (common murre) picked up by outer beach cleanup crews.

birds were picked up and disposed of by beach cleanup crews (Fig. 9). A total of 698 birds were transferred to the rescue center at the Columbian White-Tailed Deer National Wildlife Refuge where they were tagged, fed, and cleaned. Of these, 475 birds were treated and released. The species in decreasing order of abundance were western grebes, surf scoters, common murres, white-winged scoters, and black scoters.

No effects were noted on bald eagles feeding in the area. The snowy plovers nested without any observable effects and with little or no oil present at the Willapa National Wildlife Refuge.

c) Fish

Short-term, live box tests (96-hour in-situ bioassays) showed no lethal effects, and the saltwater challenge test was also negative. These tests, coupled with chemical analysis of river water from the vicinity, indicated to the Washington Department of Fisheries (WDF) that the chinook fingerlings could be released from the Washington hatchery.

Coho salmon fry stocked in river-fed holding ponds at the Trojan Nuclear Power Plant on the day of the spill were examined nine days later and were found to be within normal limits for physiological tests.

A total of 55 white sturgeon captured in a gill net were examined for oil, and 13 had oil in their mouths. A small portion of a commercial petrale sole catch was found to be oiled and was discarded by a Chinook, Washington, cannery. Various catches of oiled fish were turned in to state agencies by anglers, including a catch of surfperch with oil in the mouths.

Chemical sampling of sturgeons showed a high content of heavy naphthalenes, and the fish showed physical signs of stress (e.g., excess slime secretion). Heavy napthalenes are not particularly water soluble and presumably came from digestion of oil or oiled food by the fish.

d) Shellfish

Razor clam beds along the outer beaches were initially threatened by oil moving northward along the beach. Low population density, caused by disease and combined with negligible oiling, resulted in a minimal oil impact. In attempts to monitor the beds, collectors were required to spend up to four hours to find one specimen, making in-situ study unlikely.

Oyster beds were lightly oiled in southeastern Willapa Bay, and it is not known whether this oiling will affect their productivity.

In Grays Harbor, oyster cultch (used for setting larvae) was lightly oiled at Johns River. The effect of lost substrate for new oysters was minimal because of low coverage of the oil and the amount of cultch material available.

e) Wetlands

Aerial and ground surveys indicated that certain areas of shoreline marsh grasses in the river were lightly to moderately oiled. These and all oiled shoreline areas along the river were sites for a major cleaning effort (Fig. 10). Inspection of debris collected in some of these oiled areas indicated a low ratio of oil to debris, whereas oiled debris from outer beaches contained up to 60 percent oil (Fig. 11).

Major concerns regarding oiled marsh vegetation were:

1) Oiled blades of most species will die, fall out, and be a source of chronic low-level oil export from the river.
2) Birds and other animals are easily oiled by moving through the oiled vegetation.
3) The grasses and rushes are generally the most oleophilic substrates in the river and bays.

These concerns were minimized, however, by the overall low amount of oiling caused by rapid flushing of the river. In addition, the marshes are being monitored by Washington state agencies to determine the long-term effects of the oiling.

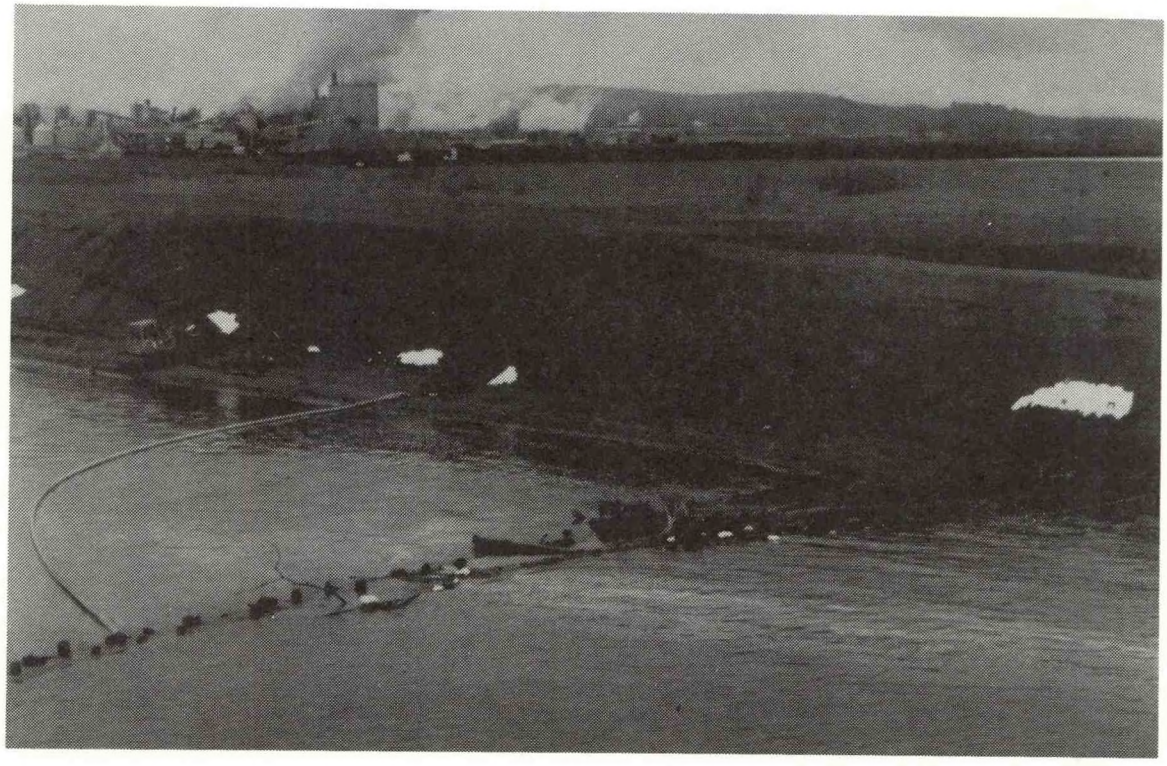

FIGURE 10. White bags of oily debris from shoreline cleanup.

FIGURE 11. Contents of bags of oil and debris from outer beach cleanup.

## E. CHEMICAL STUDIES

### 1. Analytical Procedures

A variety of chemical analyses were performed. These analyses had three purposes:

1) To characterize or "fingerprint" the oil from the ship.
2) To identify the source of the oil collected on the shore and on the river bottom.
3) To identify the source of the oil collected from dead birds, fish, and other organisms.

Characterization of the oil was necessary to determine whether toxic, water-soluble fractions might be present and to allow identification of oil samples collected downstream. It was necessary to positively identify oil found on shorelines, in bottom sediments, and in organisms to determine its impact, movement, and weathering. In addition, reports of other spills in the area necessitated positive identification of the oil samples to be certain impacts were not being attributed to these "spills of opportunity."

Oil samples were prepared for analysis as follows. Twelve to 43 mg of the oily material were dissolved in 4 ml of n-hexane. The dissolved components were separated from the asphaltenes by centrifugation at 2,000 rpm for 5 minutes. One to three ml (µl) aliquots were injected in the splitless mode into a Hewlett-Packard 5711 gas chromatograph equipped with a flame ionization detector (injection port and temperatures were 250°C). The components were separated on a 30-m by 0.32-mm fused silica column coated with SE-52 cross-linked liquid phase (SPB-5 Supelco). The column was temperature-programmed from 70°C to 270°C at 8°C per minute. The helium carrier gas had a linear velocity at 70°C of 66 cm per second. Analog data were compiled by an IBM-9000 data system with an acquisition rate of 30 points per second.

Water samples were extracted 3 times with 60 ml of n-hexane. The extracts were instrumentally analyzed as described above. An oil/water equilibration experiment was carried out by mixing oil at 1,000 ppm distilled water and stirring the mixture. The water phase was separated from the oily residue and analyzed in the same manner as the water samples collected from the environment. Table 4 identifies those samples from the oil spill which were analyzed.

TABLE 4. Samples analyzed by gas chromatography.

| *Sample Number* | *Description* |
|---|---|
| 1 | MOBILOIL tank #4 |
| 2 | MOBILOIL tank #3 |
| 3 | MOBILOIL tank #1 |
| 4 | Seaside Beach tarball (Oregon coast) |
| 5 | Midship downriver from site |
| 6 | Oil below ship |
| 7 | Oil from Jim Crow Sands (near Hammond) |
| 8 | Tarball from Ocean City (near Ocean Park) |
| 9 | Water solubles |
| 10 | Water sample from Elochoman Slough (near Columbian White-Tailed Deer National Wildlife Refuge) |
| 11 | Water near Elochoman Slough |

## 2. Chemical Analyses

Sample chromatograms are presented in Appendix E. Samples 1, 2, and 3 show a 20-minute portion of the high-resolution gas chromatograms from analyses of the three cargo samples. Chromatographic data from Samples 4 to 8 show similarities to analyses of samples collected from the environment. Examination of these data suggests to the following conclusions:

1) Chromatographic profiles from the three cargo samples were essentially identical, indicating very similar source crudes for these refined products.
2) The three cargo samples contained relatively greater quantities of insoluble components than normally encountered in unrefined crude oils. However, of the three samples, the No. 6 fuel oil contained relatively fewer insolubles than the industrial fuel oil or the heavy residual fuel.
3) It was determined, by comparison with the elution pattern of aromatic components in a reference crude oil (South Louisiana crude), that the major single class of compounds in these samples was the C1 and C2 alkyl naphthalenes.
4) The water equilibration experiment determined that these alkyl naphthalenes could be leached into the water column surrounding the spilled oil. Sample 9 shows the chromatographic data from the this experiment.
5) The chromatographic profiles from all environmental samples were essentially identical, indicating these samples had a common source.
6) These chromatographic profiles of the environmental samples were also identical to those from the cargo samples, indicating beyond a reasonable doubt that the oily residues found in the environment originated at the same source as the cargo samples (i.e., the MOBILOIL).
7) As seen in samples 10 and 11 (high-resolution gas chromatographic data from analyses of the two water samples), data from analyses of the water-column samples did not contain evidence to indicate that components from the MOBILOIL cargo were found, above detectable levels, in the water.

## F. PHYSICAL STUDIES

### 1. Extent of Oiling (Physical Processes)

#### a) River Flow.

The major transport mechanism for oil spilled during the MOBILOIL event was associated with the river flow in the Columbia. The currents within the river are primarily controlled by the volume flow which is directly related to the input through the Bonneville Dam and the flow from the Willamette River. During the first week of the spill, estimated volumes of total flow at the confluence of the Willamette and Columbia Rivers were approximately 320,000 cubic ft per second (cfs) with day-to-day variations on the order of 20,000 cfs (Personal Communication, Corps of Engineers Reservoir Control Center, Portland). These river-flow volumes resulted in an average current at St. Helens of just under two knots. The fluctuations in the currents caused by variations in the Bonneville outflow made approximately a 5 percent change in the mean flow of the river and correspond to changes in river height of about one foot. At the spill site, the dominant advective and transport processes were clearly associated with this strong river flow.

#### b) Tides.

Ocean tides propagate up the Columbia River, and the range of tidal height in the vicinity of St. Helens is approximately one ft. As the progressive wave moves up the river, it causes an oscillatory tidal current of approximately 0.5 knots. This tidal current is in addition to the major river flow. During low water when the tidal currents and river flow are added together, expected currents would be approximately 2.5 knots downstream. During the high-water period when the tidal wave is progressing up the river, it is subtracted from the expected river flow, resulting in downstream currents of 1.5 knots or slightly less. On 19 March, the tidal range at Tongue Point was 0.4-10.0 ft.

#### c) Downriver Convergent Zones.

Consideration of the tides and river flow at St. Helens clearly points out the dominant downstream flow associated with the river currents. As

one progresses seaward down the Columbia, the effect of the river currents is diminished because the channel widens and the cross-sectional area increases. In addition, the effects of the tidal currents increase because of the stronger tidal signal. The net result of these two processes is that around the vicinity of Puget Island (river mile 42), the tidal currents become strong enough to temporarily overcome the river flow. The result is a change in the flow direction or a reversal in the currents, so that for a short period during the tidal flow, the river comes to a halt and actually shows some upstream motion. This reversal has the effect of causing a strong surface convergence, and in the region of Puget Island and slightly downriver around river mile 35, one might expect some convergence of the floating surface oil. The strength and duration of the current reversal continues to increase from this location down to the river mouth.

Intrusion of salt water from the ocean can be recognized in the Columbia River near mile 20 [A. T. Pruter and D. L. Alverson (Eds.), 1972]. This intrusion leads to a classical, two-layer circulation system. The tendency in a salinity-stratified regime is for the water to flow in at the bottom and out at the top. Two-layer circulation is superimposed on the net outflow associated with the river, and not until river mile 5 or 10 is the net inflow in the bottom layer enough to overcome the mean river flow seaward. When averaged over a number of tidal cycles, there is a net upsteam current at the bottom in this area, which corresponds to a strong convergence zone in the lower layer of the river and is associated with the turbidity maximum observed in the suspended sediment distribution (Gelfenbaum, 1983). Once again, the convergent zone area has the potential to lead to higher concentrations of oil moving along the bottom of the river, either as bed load or as suspended pollutant within the deeper section of the water column. This type of convergence zone is typically associated with increased biological activity.

d) Wind Drift.

Floating oil concentrations are affected by wind drift. During most spill incidents, the effects of wind are comparable to advection because of ocean currents, but for the Columbia River spill, the river flow dominated the factors controlling movement of the oil. The winds' effects were only secondary as long as the oil remained within the river. These secondary

effects were sufficient to influence which bank of the river received the most oil. During most of the first week following the spill, the winds had a predominantly southerly component which forced surface oil onto the northern bank, or Washington coast, and led to higher concentrations of oil along that shoreline.

e) Secondary River Flow at Bends in the Channel.

Classical channel-flow models predicts uniform currents across a river as long as the channel is straight. When bends occur, cross-channel variations in the flow occur and lead to a slight tendency for surface water to move to the outside of the curve and bottom water to move to the inside. Therefore, floating pollutants would tend to accumulate on the outside of curves in the river channel. This would suggest, for example, that surface oiling might be expected along such areas as Cottonwood Island at river mile 70, or the Steamboat Slough region at river mile 34.

2. Oil Transport

a) Surface.

During the MOBILOIL oil spill, a significant amount of cargo floated on the surface of the river. The oil moved rapidly downstream and, early on the morning of 19 March, was reported in the Longview area near river mile 65. Throughout the first day, it continued to move downstream and, by evening, was in the vicinity of Wallace Island. On the morning of 20 March, it had progressed as far as Welch Island and river mile 35. This pattern continued throughout the remainder of the spill for any oil introduced at the spill site. The oil moved rapidly downstream within a two- or three-day period and exited the river or was trapped along the shoreline in the beach-face debris and sediments.

b) Subsurface.

Some of the oil spilled from the MOBILOIL was of sufficiently high density that it was distributed throughout the water column and moved downstream as a subsurface pollutant. For the most part, the transport of this oil was dominated by the effects of river currents. Since the river flow is nearly vertically homogeneous in the upper part of the river, this

subsurface oil initially moved similarly to the floating oil. Significant reductions in flow occurred only in a relatively narrow boundary layer which is confined to within a meter of the river bottom. Such uniformity of flow is characteristic in the entire upper region of the river. This is not the case, however, for the lower part of the Columbia estuary where the intrusion of salt water leads to a two-layer system. It is expected, therefore, that oil in the lower part of the water column would be slowed in the last 20 miles of the river and would not exit the river system as quickly as oil floating on the surface.

c) River Bottom Concentrations.

During the initial release from the MOBILOIL, some cargo was dense enough to sink to the river bottom. In the lee of the ship, a large eddy system formed, allowing this dense oil to settle in a pool on the river bottom. Outside of the eddy, sinking oil was quickly washed away and progressed downstream either as droplets within the water column or as a slower flow along the river bottom. The bottom boundary layer moves downstream at a reduced speed compared to either the surface currents or the flow observed at mid-depths. Oil movement through this bottom boundary layer would depend to a large extent on the form of the oil droplets, their individual density, and whether they had agglomerated onto sediment or other detritus present in the river. Projections were that the bottom oil would wash from the river but at a significantly slower rate than oil in either surface waters or mid-water column.

d) Oil Along the River Banks.

During the MOBILOIL spill, a significant amount of oil was stranded along the river banks as a result of fluctuations in river height. These fluctuations were associated with the tidal wave progressing up the river or variations in river outflow either at Bonneville Dam or from the Willamette River. As the oil was stranded along the banks, its downriver progression was temporarily stopped. In some cases, these shore concentrations were cleaned up; in others, they were rewashed back into the river because of subsequent inundation from high water. The oil reintroduced to the river created a new, or secondary, source of surface oiling along the channel. The amount of rewashing depended on how firmly the oil was adhered to the

banks of the river. Sandy beaches, for example, rewash more quickly than the marshy areas associated with some of the sloughs. Rewashing is also affected by the amplitude of the tides. Since the spill occurred during a spring tide cycle, some rewashing may not have occurred until the following spring tide cycle, nearly a month later.

e) Potential Trapping of Oil Within the River.

For the most part, the oil spilled from the MOBILOIL moved rapidly down the Columbia River. There was, however, some potential for minor accumulations to be trapped along the river and thus remain present in the system for longer than projections based upon simple advective processes would indicate:

1) Potential pockets are associated with the banks of the river, and stranding occurred because of fluctuations in the river height.
2) Reversal of the current system caused by the tidal excursion overcoming net river flow, as happens around river mile 40, may have temporarily slowed down, or pocketed, the oil in this section of the Columbia River.
3) The estuarine flow in the lower ten miles of the river could have caused a net reversal in the bottom flow and bed load. Deep distributions of oil particles could have accumulated in the Tongue Point region or in the area of the turbidity maximum.

For any of these mechanisms having the potential to pocket or trap the oil, rewashing and mixing processes tend to reduce the concentrations over time; none of these traps are likely to hold oil for extended periods.

f) Flushing Rates.

During the MOBILOIL accident, the spilled products were seen to distribute themselves from the surface to the bottom of the river and to strand along the shorelines. For each of these areas, we can make rough estimates of residence time which indicate how long the oil is likely to remain a problem. Oil floating on the surface of the water transited the river within a few days. Oil within the water column moved somewhat more slowly and was present in the river for up to a week. Bottom concentrations transited the

river even more slowly and could have been present for periods of several weeks. To the extent that oil stranded along the shoreline is reintroduced as secondary sources, these estimated flushing times may be extended slightly by the rewashing process.

3. Long-Term Trajectory

The oil lost from the MOBILOIL transited the Columbia River in three distinct ways: on the surface, in the water column, and along the bottom. In the area of saltwater intrusion, the water density increases because of higher salinity, causing some of the oil in the water column to rise to the surface. Thus, the depth at which the oil traveled was not necessarily consistent.

Quantities of oil found on outer beaches diminished rapidly. During winter, ocean currents off the Columbia River mouth are predominantly northward. March and April are considered transitional months, after which the flow is predominantly to the south. With this consideration, it is not unreasonable to find some small (but widely scattered) tarballs to the south. The majority of the oil is expected to move northward. Although this northward movement could carry oil quite far because of the dilution factor, quantifiable amounts will not be found much north of Ocean Shores.

# IV. CONCLUSIONS

The fate and effects study conducted by NOAA from 21 March to 9 May 1984 produced the following conclusions:

1. NOAA sampling on the river indicated that the Mobil estimate of 1,000 barrels of oil spilled was low. The estimate of spilled volume was later revised to 3,925 barrels by Mobil. This estimate may be further refined or expanded with additional data.
2. As of 2 April the majority of spilled oil had been either recovered or flushed out of the Columbia River.
3. Analysis of ten samples indicated that all contained oil from the MOBILOIL. The highly toxic, water-soluble fractions were not present in any of the water samples analyzed. However, heavy aromatics were found in the tissues of sturgeon, and data indicated that naphthalenes could be dissolved in the water.
4. An overall assessment of potential environmental damage will not be complete until the research conducted by DOI, National Marine Fisheries Service (NMFS), ODFW, ODEQ, WDF, and WDOE studies are completed. Following is a summary of these ongoing research efforts:
   - ° NMFS (Hammond Laboratory) is continuing benthic sampling, dungeness crab monitoring, and fish surveying by trawl studies.
   - ° ODFW will continue fish monitoring through short-term test fishing and annual monitoring of the spring chinook salmon run.
   - ° ODEQ will update their Columbia River oil spill contingency plan.
   - ° USFWS will continue monitoring impacts on birds, although bird cleanup has ceased for now.
   - ° The Washington Department of Game (WDG) is conducting a long-term monitoring program of fur-bearing animals inhabiting the oiled marsh.
   - ° WDOE will continue shoreline surveys and chemical monitoring of fish.
   - ° All agencies involved with the sampling effort will be contacted periodically by NOAA for impact updates.

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# APPENDIX A

## NOAA Response

# APPENDIX A

## NOAA RESPONSE

NOAA's involvement at the spill was divided into several phases: support of efforts by the USCG and Mobil to mitigate spill impacts; assessment of oil fate and effects; and coordination of other state and federal impact assessments. Following is a chronology of NOAA activities from 19 March through 2 April 1984.

### 19 March

At 0300, the USCG notified the SSC of the spill and requested oil trajectory information and an environmental sensitivity analysis.

Throughout the day, information relative to these two topics was relayed to the USCG via telephone from Seattle.

ODEQ, DOI, NMFS, and WDOE were contacted to coordinate evaluation of resources at risk and protective strategies.

The National Weather Service provided special forecasts for the spill area. The River Forecast Office provided information on river flows, cross-sectional areas, and velocity to support trajectory modeling efforts.

### 20 March

As trajectory forecasts by the modeling group continued, field observations of oil location and movement were hindered by poor visibility on the river.

A Regional Response Team meeting was held in Seattle, Washington. A major concern expressed at this meeting was the possibility that oil was sinking in the river. The USCG asked NOAA to determine a means of identifying sinking oil.

Coordinating efforts with resource agencies continued. Concern was expressed by an Oregon representative that little information was available on oil location and protection measures in place on the river.

After concurrence by the USCG OSC, five NOAA personnel were dispatched from Seattle to the spill scene. The group consisted of the SSC, a two-person bottom sampling crew, and a two-person aerial surveillance crew.

21 March

NOAA personnel were stationed at Kelso (Washington) for aerial surveillance; at St. Helens (Oregon) for sampling of the river bottom from the NOAA boat; and at Portland (Oregon) to coordinate scientific efforts.

State and federal agencies recommended to the USCG that side channels, sloughs, and tributary mouths downriver of the spill be protected to prevent potential impacts on waterfowl, marine mammals, fisheries, and shoreline habitats of the Lewis and Clark and Columbian White-Tailed Deer National Wildlife Refuges. Cleanup recommendations were made for shoreline areas under federal/state management.

The initial river-bottom samples taken by NOAA revealed oil on the river bottom near the vessel. Other observations indicated oil was suspended in the water column up to 50 miles downriver from the ship.

NOAA consulted the Corps of Engineers to determine how flow changes at the Bonneville Dam would affect river height and velocity at the ship.

22 March

The imminent release of hatchery salmon fingerlings upstream and downstream from the ship became a major concern.

NOAA requested that the USCG secure cargo samples from each damaged tank and that a careful accounting of oil transfers from the vessel be maintained. The volume of spill estimate was questioned.

Four NOAA personnel sampled the bottom near the vessel, and 100-ft by 1,300-ft oil patch on the bottom was identified. It was estimated that this patch contained 10,000-40,000 gallons of oil. Midwater trawls indicated the presence of in the water column. NMFS conducted trawl surveys and found submerged oil near Astoria, Oregon.

NOAA, DOI, and State of Oregon and Washington representatives discussed requirements for an initial assessment of natural resource impacts.

NOAA began daily briefings on information collected by resource agencies for the Mobil environmental affairs representative.

23 March

The NOAA sampling effort concentrated in the area of the Lewis and Clark National Wildlife Refuge to evaluate downriver migration of subsurface oil.

Current-velocity estimates at the vessel and downriver were made for the USCG at the request of Mobil. A NOAA representative was flown to the vessel by Mobil to make additional observations of river velocity.

NOAA, DOI, USCG, and State of Washington and Oregon representatives met to evaluate the need for an assessment of natural resource impacts as a result of the spill. NOAA agreed to determine transport and fate of oil at the surface, water column, and bottom of the river and to coordinate data management efforts of other agencies.

24 March

NOAA, DOI, and State of Oregon and Washington representatives met with Mobil and their insurance representative to discuss resources of concern on the river and plans to assess the impact of oil on those resources.

NOAA personnel met with Washington State and DOI representatives to begin specific planning for sampling on the river.

Removal of the oil mass on the bottom near the vessel was recommended after consultation with the states and DOI.

25 March

After consultation with various groups, specific information on Bonneville Dam flows, travel time to vessel, and river height was passed to Mobil through the USCG.

NOAA personnel and contractors on-scene increased from 5 to 13 in anticipation of an intensive 10-day sampling and data management effort. A NOAA field coordination center was established in Astoria, Oregon, to support field operations. The SSC remained in Portland to support the USCG efforts. The NOAA team consulted with National Wildlife Refuge managers on the most appropriate cleanup methods to be used in oiled wetland areas. This information was passed to the USCG and Mobil.

26 March

The vessel floated free.

A NOAA crew overflew the area to map oil locations and to look for additional oil release.

The NOAA crew sampled the water column and bottom downriver from the ship and at the location of ship grounding. The mass of oil on the bottom at the ship apparently had moved downriver.

Coordination of field sampling with Washington, Oregon, and DOI was undertaken by NOAA.

An intensive data management effort was initiated to obtain records of all oil observations made to date by each agency involved.

NOAA General Counsel was requested to provide guidance on NOAA actions during damage assessment activity.

27 March

The overall sampling plan design and coordination were finalized.

Two crews sampled Elochoman Slough and the Astoria Bridge area by boat to collect water-column and bottom samples.

An observer was sent on an NMFS vessel to record observations during bottom trawls in the lower river and Grays Bay area.

The SSC departed Portland for Astoria as requirements by the USCG for consultation on mitigation efforts were reduced.

28 March

NOAA sampling crews were deployed to various sites.

The area of vessel grounding was sampled by NOAA to determine the status of sunken oil.

Taylor Sands, Rice Island, and Miller Sands crews surveyed the bottom for oil contamination.

Oil samples from the vessel cargo tanks were obtained from the USCG.

An observer accompanied NMFS personnel during trawl sampling.

Trajectories for oil movement along the Washington coast were refined by NOAA.

29 March

Samples of oil from the vessel and various sites on the river were collected by NOAA and State of Washington personnel and taken to a local lab for analysis.

Two NOAA boat crews on the river sampled at Harrington Point, Rocky Point, and Grays Point from one platform, and Taylor Sands, Rice Island, Miller Sands, and Jim Crow Sands from a second platform.

The NOAA sampling rationale was reviewed with the states and revised to insure compatibility with biological sampling activities.

The sampling plan was to use integrated samples (otter trawls with sorbent pads) to check as much of the bottom water in the river as possible (Fig. 6).

30 March

Two NOAA boat crews sampled the water column using bottom trawls in the lower river and in the area of the Lewis and Clark National Wildlife Refuge.

Results of the chemical analyses from cargo, river, and ocean samples showed that oil coming ashore in the river and on the outer coast was from the MOBILOIL.

31 March

Ground surveys were made by NOAA on Oregon beaches near Seaside, and north of the river on the Washington coast. Fishing boat operators at Ilwaco and Chinook were interviewed. The north shore of the river near the mouth was also surveyed.

Additional samples were selected for chemical analysis.

Coordination with the state sampling effort continued.

1 April

An aerial beach survey of the Washington coast was conducted. The boat crew conducted trawl sampling in Ilwaco Channel.

Results of the previous week's sampling effort were reviewed and synthesized.

Requirements for future sampling efforts were determined.

The coordination center in Astoria was closed. Remaining field personnel were moved to Kelso, Washington.

2 April and Ongoing

NOAA and State of Oregon and Washington personnel met to review sampling efforts of the previous two weeks and to evaluate future requirements.

The data management group continued to obtain information from other agencies so that a complete history of activities, observations, and sampling would be available for later reference.

# APPENDIX B

## RESPONSE BY OTHER AGENCIES

# APPENDIX B

# RESPONSE BY OTHER AGENCIES

## 1. STATE OF WASHINGTON RESPONSE

The State of Washington's response to the MOBILOIL spill began on the day of the spill when the WDF surveyed the river from Vancouver to Longview. On 20 March, the Marine Resource Damage Assessment (MRDA) group was activated. MRDA is a group of state agencies whose activities are monitored and coordinated by WDOE in times of actual or potential environmental damage. The participants in MRDA are WDOE, WDF, Washington Department of Emergency Services (WDES), Washington Department of Natural Resources (WDNR), the Department of Social and Health Services, the Parks and Recreation Commission, and WDG. On 20 March, several field activities were initiated. A WDF crew was on the river between 0800 and 1530. From the ship to 2,600 ft downstream, a heavy slick was noted from bank to bank, and tarballs were found on the beaches and in the water downstream to Kalama. WDF took preoiling beach samples at Long Beach, Ocean Shores, and Grayland beaches, and on 21 March, began ocean beach surveys from the North Jetty (Cape Disappointment) to Ocean Shores, Washington.

WDOE and WDF staff also deployed cages containing live fish at Elochoman and Bachelor (control) Sloughs on 27 March. No mortality was noted when the fish cages were removed on 2 April. Water samples were taken and water chemistry parameters were recorded during the period at the fish-cage sites.

Throughout the spill, WDF conducted angler surveys and examined commercial fish buy-tickets for reports of oiling. The sample-tracking effort for the state is given in Appendix C. The State of Washington remains concerned about long-term effects of the spill and will continue to monitor the situation for some time.

## 2. STATE OF OREGON RESPONSE

The State of Oregon was notified of the accident by the USCG at 0200 on 19 March and had staff on-site at the USCG command post at 0530 that morning. ODFW had crews on the river by 0930 that morning, examining effects and possible mitigation measures that could be taken. ODEQ also had

personnel on-scene that morning and, along with ODFW, overflew the spill site and the impacted areas of the river. Both of these agencies continued to work with the USCG on cleanup efforts, while also monitoring oil impacts on the Oregon side of the river. ODFW personnel continued conducting the angler fishing surveys by air and boat, which they had begun prior to the spill. Notes on extent of oiling and oiled fish or gear were taken. The Oregon agencies were also in touch with various industries along the river and were receiving regular reports of any oil-related problems. ODFW had a large number of hatchery-raised coho salmon fingerlings in river-fed ponds at the Trojan Nuclear Power Plant, 10 miles downriver from the spill site. By coincidence, these salmon were put into the ponds the morning of the incident and, consequently, were closely monitored for mortality and sublethal impacts. ODEQ and ODFW personnel also conducted a boat survey of the river bottom and shoreline from the spill site to Astoria on the 28-30 March. The sample tracking for various Oregon state personnel is listed in Appendix C of this report.

## 3. NOAA'S NATIONAL MARINE FISHERIES SERVICE RESPONSE

The NMFS Biological Field Station at Hammond, Oregon, provided historical prespill field information and specific postspill support during the MOBILOIL response effort. The director of the facility and his staff occupied a number of historic trawl sites and bottom sampling stations beginning on the morning of 21 March. Additional sediment samples were taken on the beach, as well as bird and fish specimens. Visual surveys documented with narrative text and photographs were made when sampling was not possible. Subtidal bottom trawls and beach sampling efforts on 22 March documented oiling on both sides of the river, near the Astoria Bridge, off McGregor Island, and in other areas. Oil globs on the beach and oiled birds, dead and alive, were documented near the Hammond Station on 27 March. The Hammond Field Station is maintaining on-site custody of the samples, photographs, and supporting documentation. Historic trawl sites and other stations are still being sampled by Hammond, to monitor any reappearance of oil.

## 4. EPA RESPONSE

EPA personnel were on-scene at the USCG command post for the first two days of the spill response and returned on 28 March to conduct further examinations of the oil in the river. On 29 March, EPA personnel conducted a river-bottom sampling program to determine the presence or absence of oil in the Columbia River. The sampling method consisted of lowering a 10-pound lead ball wrapped in sorbent material to the bottom and examining the material for oil upon retrieval. The sampling sites were selected from information given by a local commercial sturgeon fisherman. These sturgeon fishery "holes" were sampled between Martin Island, downstream to Stella, Washington. Additional midchannel, backwater, and transect stations were also sampled in this area. Two stations at Cottonwood Island at 40- to 50-ft depths showed even light oiling. All other stations showed only flecks of oil on the absorbent material.

# APPENDIX C

## SAMPLE TRACKING

NOAA/HAZMAT SAMPLE TRACKING FOR THE MOBILOIL SPILL (BY SEQ. #) HSTR07
REPORT DATE: 12 JUL 1984

| DATE TIME | SEQ. # | AGENCY / NAME LOCATION(S) | FIELD TAG# | WHAT WAS SAMPLED RESULTS | METHOD USED |
|---|---|---|---|---|---|
| | | NOTES | | | |
| 21 MAR 1450 | 001 | NOAA/KUMMERLOWE B-7 (BUOY 7) | 1 | BOTTOM SEDIMENT/SAND | GRAB |
| 21 MAR 1530 | 002 | NOAA/KUMMERLOWE BUOY 7 | 2 | BOTTOM SEDIMENT, DETRITUS, SAND (OILING?) | TOW |
| 21 MAR 1550 | 003 | NOAA/KUMMERLOWE MID-SHIP, DOWN RIVER | 3 | BOTTOM ROCK AND SEDIMENT (OILED?) | GRAB |
| 21 MAR 1545 | 004 | NOAA/KUMMERLOWE MID-SHIP,DOWN RIVER | 4 | GRAB, ROCK ROCK WITH SEDIMENT, SOME OILING | GRAB |
| 21 MAR 1600 | 005 | NOAA/KUMMERLOWE MID-SHIP, DOWN RIVER HEAVY OILING | 5 | BOTTOM SEDIMENT WITH OIL IN SAND | GRAB |
| 21 MAR 1640 | 006 | NOAA/KUMMERLOWE ABEAM WARRIOR ROCK | 6 | BOTTOM SEDIMENT/SAND | GRAB |
| 21 MAR 1700 | 007 | NOAA/KUMMERLOWE TRANSECT 1,STATION A | 7 | BOTTOM SEDIMENT/AND | GRAB |
| 21 MAR 1720 | 008 | NOAA/KUMMERLOWE TRANSECT 1, STATION C | 8 | BOTTOM SEDIMENT/SAND | GRAB |
| 21 MAR 1729 | 009 | NOAA/KUMMERLOWE 100 YDS EAST OF WARRIOR ROCK | 9 | BOTTOM SEDIMENT/SAND | GRAB |
| 21 MAR 1740 | 010 | NOAA/KUMMERLOWE 25 YDS NE WARRIOR ROCK LIGHT | 10 | BOTTOM SEDIMENT/SAND | GRAB |
| 22 MAR 1339 | 011 | NOAA/KUMMERLOWE LINE BETWEEN WARRIOR ROCK AND DM 80 OILING ON DIAPER | 1 | BOTTOM OIL AND SEDIMENT | CANNONBALL |
| 22 MAR 1346 | 012 | NOAA/KUMMERLOWE WARRIOR ROCK BETWEEN DM 80 AND 79 | 2 | BOTTOM HEAVY OILING, LIGHT SEDIMENT | CANNONBALL |
| 22 MAR 1402 | 013 | NOAA/KENNEDY RIGHT SIDE OF WARRIOR ROCK* *TANGENT TO BEACH, 150 YARDS NORTH OF PREVIOUS LINE | 3 | BOTTOM HEAVY OILING | CANNONBALL |
| 22 MAR 1413 | 014 | NOAA/KENNEDY LINE BETWEEN WARRIOR ROCK, STACK 25 YDS FROM LIGHT | 4 | BOTTOM HEAVY OILING | CANNONBALL |
| 22 MAR 1522 | 015 | NOAA/KUMMERLOWE BETWEEN DAYMARKS 73 & 72 | 5 | WATER COLUMN DETRITUS, SEDIMENT, OIL (ABOUT 1/8 CUP) | PLANKTON NET |
| 26 MAR 1120 | 016 | NOAA/MCGEE SHIP SITE SAMPLE DISPOSED, SEE PHOTOGRAPH | 101 | BOTTOM LIGHT OILING | CANNONBALL |
| 26 MAR 1132 | 017 | NOAA/MCGEE SHIP SITE SAMPLE DISPOSED, SEE PHOTOGRAPH | 102 | BOTTOM VERY LIGHT OILING | CANNONBALL |
| 26 MAR 1142 | 018 | NOAA/KUMMERLOWE SHIP SITE SAMPLE DISPOSED, SEE PHOTOGRAPH | 103 | BOTTOM LIGHT OILING | CANNONBALL |

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| DATE TIME | SEQ. # | AGENCY / NAME LOCATION(S) NOTES | FIELD TAG# | WHAT WAS SAMPLED RESULTS | METHOD USED |
|---|---|---|---|---|---|
| 26 MAR 1206 | 019 | NOAA/MCGEE SHIP SITE SAMPLE DISPOSED, SEE PHOTOGRAPH | 104 | BOTTOM LIGHT OILING | CANNONBALL |
| 26 MAR 1214 | 020 | NOAA/CARLSON SHIP SITE | 105 | SURFACE WATER OIL SHEEN AND TAR BALLS COLLECTED | JAR (SURFACE WATER) |
| 26 MAR 1216 | 021 | NOAA/CARLSON SHIP SITE | 106 | SURFACE WATER OIL SHEEN AND TARBALLS COLLECTED | JAR (SURFACE WATER) |
| 26 MAR 1220 | 022 | NOAA/CARLSON SHIP SITE | 107 | SURFACE WATER OIL SHEEN AND TAR BALLS COLLECTED | JAR (SURFACE WATER) |
| 26 MAR 1224 | 023 | NOAA/CARLSON SHIP SITE | 108 | SURFACE WATER OIL SHEEN AND TAR BALLS COLLECTED | JAR (SURFACE WATER) |
| 26 MAR 1227 | 024 | NOAA/CARLSON SHIP SITE | 109 | SURFACE WATER OIL SHEEN AND TAR BALLS COLLECTED | JAR (SURFACE WATER) |
| 26 MAR 1228 | 025 | NOAA/CARLSON. SHIP SITE | 110 | SURFACE WATER OILSHEEN AND TAR BALLS COLLECTED | JAR (SURFACEWATER) |
| 26 MAR 1238 | 026 | NOAA/CARLSON SHIP SITE | 111 | SURFACE WATER OIL SHEEN AND TAR BALLS COLLECTED | JAR (SURFACE WATER) |
| 26 MAR 1239 | 027 | NOAA/CARLSON SHIP SITE | 112 | SURFACE WATER OIL SHEENAND TAR BALLS COLLECTED | JAR (SURFACE WATER) |
| 26 MAR 1248 | 028 | NOAA/MCGEE SHIP SITE SAMPLE DISPOSED, SEE PHOTOGRAPH | 113 | BOTTOM LIGHT TO MODERATE OILING | CANNONBALL |
| 26 MAR 1256 | 029 | NOAA/MCGEE SHIP SITE SAMPLE DISPOSED, SEE PHOTOGRAPH | 114 | BOTTOM LIGHT OILING | CANNONBALL |
| 26 MAR 1302 | 030 | NOAA/MCGEE SHIP SITE SAMPLE DISPOSED, SEE PHOTOGRAPH | 115 | BOTTOM LIGHT TO MODERATE OILING | CANNONBALL |
| 26 MAR 1310 | 031 | NOAA/MCGEE SHIP SITE SAMPLE DISPOSED,NO PHOTOGRAPH | 116 | BOTTOM LIGHT TO MODERATE OILING | CANNONBALL |
| 26 MAR 1315 | 032 | NOAA/MCGEE SHIP SITE SAMPLE DISPOSED, SEE PHOTOGRAPH | 117 | BOTTOM LIGHT OILING | CANNONBALL |
| 26 MAR 1320 | 033 | NOAA/MCGEE SHIP SITE SAMPLE DISPOSED, SEE PHOTOGRAPH | 118 | BOTTOM LIGHT OILING | CANNONBALL |
| 26 MAR 1503 | 034 | NOAA/CARLSON BUOY "7" | 119 | BOTTOM CLEAN SEDIMENT/SAND | CLAM SHELL GRAB |
| 26 MAR 1524 | 035 | NOAA/CARLSON SHIP SITE NO APPARENT OILING NOTICED | 120 | BOTTOM SEDIMENT/SAND SAMPLE | CLAM SHELL GRAB |
| 26 MAR 1600 | 036 | NOAA/KUMMERLOWE TRANSECT BETWEEN DAY MARKERS 72 AND 73 1600-1635 TRANSECT PERIOD | 121 | BOTTOM NET AND SEDIMENT HEAVILY OILED | PLANKTON NET |

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| DATE TIME | SEQ. # | AGENCY / NAME LOCATION(S) | FIELD TAG# | WHAT WAS SAMPLED RESULTS | METHOD USED |
|---|---|---|---|---|---|
| | | NOTES ..... | | | |
| 26 MAR 1600 | 037 | NOAA/KUMMERLOWE<br>TRANSECT BETWEEN DAY MARKERS 72 AND 73 | 122 | BOTTOM<br>NET AND SEDIMENT HEAVILY OILED | PLANKTON NET |
| | | 1600-1635 TRANSECT PERIOD | | | |
| 26 MAR 1600 | 038 | NOAA/KUMMERLOWE<br>TRANSECT BETWEEN DAY MARKERS 72 AND 73 | 123 | BOTTOM<br>NET AND SEDIMENT HEAVILY OILED | PLANKTON NET |
| | | 1600-1635 TRANSECT PERIOD | | | |
| 26 MAR 1600 | 039 | NOAA/KUMMERLOWE<br>TRANSECT BETWEEN DAY MARKERS 72 AND 73 | 124 | BOTTOM<br>NET AND SEDIMENT HEAVILY OILED | PLANKTON NET |
| | | 1600-1635 TRANSECT PERIOD | | | |
| 26 MAR 1600 | 040 | NOAA/KUMMERLOWE<br>TRANSECT BETWEEN DAY MARKERS 72 AND 73 | 125 | BOTTOM<br>NET AND SEDIMENT HEAVILY OILED | PLANKTON NET |
| | | 1600-1635 TRANSECT PERIOD | | | |
| 26 MAR 1600 | 041 | NOAA/KUMMERLOWE<br>TRANSECT BETWEEN DAY MARKERS 72 AND 73 | 126 | BOTTOM<br>NET AND SEDIMENT HEAVILY OILED | PLANKTON NET |
| | | 1600-1635 TRANSECT PERIOD | | | |
| 26 MAR 1630 | 042 | NOAA/KUMMERLOWE<br>TRANSECT BETWEEN DAY MARKERS 72 AND 73 | 127 | BOTTOM<br>EVIDENCEOF MODERATE/HEAVY OILING ON NET | PHOTOGRAPH (PLANKTON NET) |
| | | | | | |
| 26 MAR 1124 | 043 | NOAA/MCGEE<br>SHIP SITE | 128 | BOTTOM<br>NO OILING | CANNONBALL |
| | | SAMPLE DISPOSAL, NO PHOTOS | | | |
| 26 MAR 1126 | 044 | NOAA/MCGEE<br>SHIP SITE | 129 | BOTTOM<br>NO OILING | CANNONBALL |
| | | SAMPLE DISPOSAL, NO PHOTOS | | | |
| 26 MAR 1128 | 045 | NOAA/MCGEE<br>SHIP SITE | 131 | BOTTOM<br>NO OILING | CANNONBALL |
| | | SAMPLE DISPOSAL, NO PHOTOS | | | |
| 26 MAR 1130 | 046 | NOAA/MCGEE<br>SHIP SITE | 131 | BOTTOM<br>NO OILING | CANNONBALL |
| | | SAMPLE DISPOSED, NO PHOTOS | | | |
| 26 MAR 1137 | 047 | NOAA/MCGEE<br>SHIP SITE | 132 | BOTTOM<br>NO OILING | CANNONBALL |
| | | SAMPLE DISPOSAL, NO PHOTOS | | | |
| 26 MAR 1203 | 048 | NOAA/MCGEE<br>SHIP SITE | 133 | BOTTOM<br>NO OILING | CANNONBALL |
| | | SAMPLE DISPOSAL, NO PHOTOS | | | |
| 26 MAR 1246 | 049 | NOAA/MCGEE<br>SHIP SITE | 134 | BOTTOM<br>NO OILING | CANNONBALL |
| | | SAMPLE DISPOSAL, NO PHOTOS | | | |
| 26 MAR 1253 | 050 | NOAA/MCGEE<br>SHIP SITE | 135 | BOTTOM<br>NO OILING | CANNONBALL |
| | | SAMPLE DISPOSAL, NO PHOTOS | | | |
| 26 MAR 1300 | 051 | NOAA/MCGEE<br>SHIP SITE | 136 | BOTTOM<br>NO OILING | CANNONBALL |
| | | SAMPLE DISPOSED, NO PHOTOS | | | |
| 26 MAR 1307 | 052 | NOAA/MCGEE<br>SHIP SITE | 137 | BOTTOM<br>NO OILING | CANNONBALL |
| | | SAMPLE DISPOSED, NO PHOTOS | | | |
| 26 MAR 1325 | 053 | NOAA/MCGEE<br>SHIP SITE | 138 | BOTTOM<br>NO OILING | CANNONBALL |
| | | SAMPLE DISPOSAL, NO PHOTOS | | | |
| 26 MAR 1110 | 054 | NOAA/KUMMERLOWE<br>SHIP SITE | 139 | SURFACE WATER<br>SILVER TO RAINBOW, TARBALLS AVERAGE SIZE .5 CM, SHEENS 20% | VISUAL SURVEY |
| | | COVERAGE OF RIVER, SHORE TO SHORE TARBALL DENSITY, 1 PER 10 SQ. FEET | | | |

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|---|---|---|---|---|---|
| 26 MAR 1210 | 055 | NOAA/KUMMERLOWE SHIP SITE COVERAGE OF RIVER, SHORE TO SHORE, TARBALL DENSITY, 1 PER 10SQ. FEET | 140 | SURFACE WATER SILVER TO RAINBOW, TARBALLS AVERAGE SIZE .5 CM, SHEENS 20% | VISUAL SURVEY |
| 26 MAR 1310 | 056 | NOAA/KUMMERLOWE SHIP SITE COVERAGE OF RIVER, SHORE TO SHORE, TARBALL DENSITY, 1 PER 10 SQ. FEET | 141 | SURFACE WATER SILVER TO RAINBOW, TARBALLS AVERAGE SIZE .5 CM, SHEEN 20% | VISUAL SURVEY |
| 26 MAR 1250 | 057 | NOAA/KAISER NE OF MILLER SANDS AT BUOY #12 | A-86-1 | BEACH SURVEY NO OIL - DARK SANDS | SCOOP BEACH SAMPLE - HOTO |
| 26 MAR 1352 | 058 | NOAA/KAISER ENTRANCE TO ELOCHOMAN SLOUGH 20' WATER DEPTH | A-86-2 | BOTTOM NO OIL | CANNONBALL |
| 26 MAR 1353 | 059 | NOAA/KAISER ENTRANCE TO ELOCHOMAN SLOUGH WATER DEPTH 5' | A-86-3 | BOTTOM NO OIL | CANNONBALL |
| 26 MAR 1355 | 060 | NOAA/KAISER MID-CHANNEL OF ELOCHOMAN SLOUGH 60' WATER DEPTH | A-86-4 | BOTTOM NO OIL | CANNONBALL |
| 26 MAR 1400 | 061 | NOAA/KAISER ENTRANCE SOUTH OF ELOCHOMAN SLOUGH (RANGE MARKS) WATER DEPTH UNKNOWN | A-86-5 | BOTTOM NO OIL | CANNONBALL |
| 26 MAR 1403 | 062 | NOAA/KAISER ENTRANCE SOUTH OF ELOCHOMAN SLOUGH (RANGE MARKS) SAMPLE TAKEN AT 3' DEPTH | A-86-6 | WATER | WHEATON SAMPLER |
| 26 MAR 1410 | 063 | NOAA/KAISER 200 YDS SOUTH OF DAY MARKER 39 | A-86-7 | BOTTOM NO OIL | CANNONBALL |
| 26 MAR 1411 | 064 | NOAA/KAISER ENTRANCE TO HUNTING ISLAND SLOUGH 5' WATER DEPTH | A-86-8 | WATER | WHEATON SAMPLER |
| 26 MAR 1413 | 065 | NOAA/KAISER ENTRANCE TO HUNTING ISLAND SLOUGH 5' WATER DEPTH | A-86-9 | BOTTOM NO OIL | CANNONBALL |
| 26 MAR 1415 | 066 | NOAA/KAISER WESTSHORE NEAR ENTRANCE TO HUNTING ISLAND SLOUGH NEAR WATER'S EDGE. BARELY COLLECTIBLE AMOUNTS. (5 PHOTOS) | A-86-10 | SHORELINE RANDOM SILVER DOLLAR-SIZEDSMEARS, SOME OILING OF GRASSES | SCOOP/PHOTOS |
| 26 MAR 1442 | 067 | NOAA/KAISER MID-CHANNEL OF CATHLAMET CHANNEL 60' WATER DEPTH | A-86-11 | BOTTOM NO OIL | CANNONBALL |
| 26 MAR 1447 | 068 | NOAA/KAISER DAY MARKER 42 OFF SOUTHERN END TENASILLAHE ISLAND | A-86-12 | BOTTOM NO OIL | CANNONBALL |
| 26 MAR 1449 | 069 | NOAA/KAISER DAY MARKER 42,SOUTH END OF TENASILLAHE ISLAND 3'SAMPLER DEPTH | A-86-13 | WATER | WHEATON SAMPLER |
| 26 MAR 1513 | 070 | NOAA/KAISER MID-CHANNEL SW OF SOUTH TIP OF TENASILLAHE ISLAND SHALLOW | A-86-14 | BOTTOM NO OIL | CANNONBALL |
| 26 MAR 1520 | 071 | NOAA/KAISER 400 YD EAST OF JIM CROW PT TO SKAMOKAWAY -DAYMK 31 LESS THAN 100' OFFSHORE | A-86-15 | SHORELINE NO VISIBLE OIL | VISUAL SURVEY |
| 26 MAR 1525 | 072 | NOAA/KAISER NW TIP OF PRICE ISLAND 1 3" PATCH OF OIL | A-86-16 | SHORELINE 1 OILED BIRD (MOBILE), SPECIES UNKNOWN | VISUAL/PHOTO |

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|---|---|---|---|---|---|
| | | NOTES ..... | | | |
| 26 MAR 1525 | 073 | NOAA/KAISER<br>1/2 MILE NW OF CATHLAMET BRIDGE, MID-CHANNEL<br>CONVERSTION WITH FISHING VESSEL | A-86-17 | PUBLIC CONTACT<br>BOTTOM. (RESULTS): NO OIL | SMELT NET-BOTTOM TO 10' ABOVE |
| 26 MAR 1530 | 074 | NOAA/KAISER<br>LIVESTOCK DOCK ON SW SHORE OF TENASILLAHE ISLAND<br>SMALL PATCHES ONSHORE (2 PHOTOS) | A-86-18 | BEACH SURVEY<br>SMALLCLEANABLE AMOUNT OF OIL TRAPPED BEHIND DOCK, MINOR | VISUAL/PHOTO |
| 26 MAR 1545 | 075 | NOAA/KAISER<br>ALDRICH POINT BOAT RAMP | A-86-19 | SHORELINE<br>NO OIL OBSERVED IN AN AREA CONDUCIVE TO IT. BRINE TRAPPED. | VISUAL SURVEY |
| 26 MAR 1550 | 076 | NOAA/KAISER<br>HORSESHOE ISLAND,WOODY ISLAND CHANNEL | A-86-20 | SHORELINE<br>NO OIL SIGHTED IN AREA CONDUCIVE TO IT BEING TRAPPED. | VISUAL SURVEY |
| 26 MAR 1600 | 077 | NOAA/KAISER<br>JIM CROW SANDS<br>FREE. | A-86-21 | SHORELINE<br>WEST POINTOF ISLAND,CLOCKWISE TO MIDDLE OF SOUTH SHORE OIL | WALKED SHORELINE |
| 27 MAR 1400 | 078 | NOAA/KUMMERLOWE<br>BETWEEN N. BRIDGE PILING & BUOY 35A, N. OF SHIP*<br>90' WATER DEPTH, 2 KNOT CURRENT | B-87-1 | BOTTOM<br>NO OIL - ALL REPLICATES CLEAN<br>*CHANNEL OFF W. MOORING BASIN | CANNONBALL |
| 27 MAR 1430 | 079 | NOAA/KUMMERLOWE<br>BETWEEN N. BRIDGE PILING & BUOY 35A N. OF SHIP*<br>DEPTH 50', CURRENT 2-3 KNOTS. SLIGHT SHEEN NOTED IN WATER OFSAMPLE. *CHANNEL OFF W. MOORING BASIN | B-87-2 | BOTTOM | CLAMSHELL GRAB |
| 27 MAR 1442 | 080 | NOAA/KUMMERLOWE<br>N. OF SHIP CHANNEL BETWEEN N. BRIDGE & BUOY 35A<br>.5 METER DEPTH | B-87-3 | WATER | WHEATON WATER SAMPLER |
| 27 MAR 1445 | 081 | NOAA/KUMMERLOWE<br>N OF SHIP CHANNEL BETWEEN N. BRIDGE & BUOY 35A<br>DEPTH .5 METERS | B-87-4 | WATER | WHEATON WATER SAMPLER |
| 27 MAR 1447 | 082 | NOAA/KUMMERLOWE<br>N. SHIP CHANNEL BETWEEN N. BRIDGE & BUOY 35A<br>SURFACE SAMPLE | B-87-5 | SURFACE WATER | JAR (SURFACE WATER) |
| 27 MAR 1448 | 083 | NOAA/KUMMERLOWE<br>N. SHIP CHANNEL BETWEEN N. BRIDGE & BUOY 35A<br>SURFACE | B-87-6 | SURFACE WATER | JAR (SURFACE WATER) |
| 27 MAR 1448 | 084 | NOAA/KUMMERLOWE<br>N. OF SHIP CHANNEL BETWEEN N. BRIDGE & BUOY 35A<br>NO VISUAL SIGN OF SHEEN OR TARBALLS | B-87-7 | SURFACE WATER | VISUAL SURVEY |
| 27 MAR 1520 | 085 | NOAA/KUMMERLOWE<br>DESDEMONA SANDS LIGHT<br>24'DEPTH | B-87-8 | BOTTOM<br>CLEAN | CANNONBALL |
| 27 MAR 1523 | 086 | NOAA/KUMMERLOWE<br>DESDEMONA SANDS LIGHT<br>DEPTH 24' | B-87-9 | BOTTOM | CLAM SHELL GRAB |
| 27 MAR 1529 | 087 | NOAA/KUMMERLOWE<br>DESDEMONA SANDS<br>.5 METER DEPTH | B-87-10 | WATER | WHEATON WATER SAMPLER |
| 27 MAR 1531 | 088 | NOAA/KUMMERLOWE<br>DESDEMONA SANDS LIGHT<br>.5 METER DEPTH | B-87-11 | WATER | WHEATON WATER SAMPLER |
| 27 MAR 1532 | 089 | NOAA/KUMMERLOWE<br>DESDEMONA SANDS LIGHT | B-87-12 | SURFACE WATER | JAR (SURFACE WATER) |
| 27 MAR 1533 | 090 | NOAA/KUMMERLOWE<br>DESDEMONA SANDS LIGHT | B-87-13 | SURFACE WATER | JAR (SURFACE WATER) |

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|---|---|---|---|---|---|
| | | NOTES | | | |
| 27 MAR 1552 | 091 | NOAA/KUMMERLOWE ENTRANCE TO HAMMOND MARINA | B-87-14 | SURFACE WATER | JAR (SURFACE WATER) |
| 27 MAR 1557 | 092 | NOAA/KUMMERLOWE ENTRANCE TO HAMMOND MARINA | B-87-15 | SURFACE WATER | JAR (SURFACE WATER) |
| 27 MAR 1605 | 093 | NOAA/KUMMERLOWE ENTRANCE TO HAMMOND MARINA | B-87-16 | SURFACE WATER | JAR (SURFACE WATER) |
| 27 MAR 1607 | 094 | NOAA/KUMMERLOWE ENTRANCE TO HAMMOND MARINA | B-87-17 | SURFACE WATER | JAR (SURFACE WATER) |
| 27 MAR 1609 | 095 | NOAA/KUMMERLOWE ENTRANCE TO HAMMOND MARINA | B-87-18 | SURFACE WATER | JAR (SURFACE WATER) |
| | | TARBALL | | | |
| 27 MAR 1615 | 096 | NOAA/KUMMERLOWE ENTRANCE TO HAMMOND MARINA | B-87-19 | SURFACE WATER | JAR (SURFACE WATER) |
| 27 MAR 1620 | 097 | NOAA/KUMMERLOWE INSIDE HAMMOND MARINA | B-87-20 | SURFACE WATER | JAR (SURFACE WATER) |
| 27 MAR 1625 | 098 | NOAA/KUMMERLOWE INSIDE HAMMOND MARINA | B-87-21 | SURFACE WATER | JAR (SURFACE WATER) |
| | | 3 PHOTOS TAKEN | | | |
| 27 MAR 1628 | 099 | NOAA/KUMMERLOWE INSIDE HAMMOND MARINA | B-87-22 | SURFACE WATER | JAR (SURFACE WATER) |
| 27 MAR 1632 | 100 | NOAA/KUMMERLOWE INSIDE HAMMOND MARINA | B-87-23 | BOTTOM CLEAN | CANNONBALL |
| | | 15' DEPTH | | | |
| 27 MAR 1634 | 101 | NOAA/KUMMERLOWE INSIDE HAMMOND MARINA | B-87-24 | BOTTOM | CLAM SHELL GRAB |
| | | 15' DEPTH - ENOUGH SEDIMENT WAS COLLECTED TO FILL 2 SAMPLE JARS - 1 PHOTO | | | |
| 27 MAR 1105 | 102 | NOAA/CARLSON MOUTH OF ELOCHOMAN SLOUGH | A-87-1 | BOTTOM NO OIL, NO SAMPLE | CANNONBALL |
| | | WATER DEPTH 10', MOUTH OF ELOCHOMAN SLOUGH | | | |
| 27 MAR 1107 | 103 | NOAA/CARLSON NORTH EDGE OF CHANNEL-ELOCHOMAN SLOUGH | A-87-2 | BOTTOM NO OIL, NO SAMPLE | CANNONBALL |
| | | 50' WATER DEPTH | | | |
| 27 MAR 1110 | 104 | NOAA/CARLSON MID-CHANNEL, OFF ELOCHOMAN SLOUGH ON RANGE MARKS | A-87-3 | BOTTOM NO OIL, NO SAMPLE | CANNONBALL |
| | | 60' DEPTH | | | |
| 27 MAR 1113 | 105 | NOAA/CARLSON SOUTH SIDE OF CHANNEL OFF ELOCHOMAN SLOUGH | A-87-4 | BOTTOM NO OIL, NO SAMPLE | CANNONBALL |
| | | 40' DEPTH | | | |
| 27 MAR 1117 | 106 | NOAA/CARLSON NEAR SOUTH SHORE OF CHANNEL, ELOCHOMAN SLOUGH | A-87-5 | BOTTOM NO OIL, NO SAMPLE | CANNONBALL |
| | | 18' DEPTH | | *200' FROM SHORE | |
| 27 MAR 1120 | 107 | NOAA/CARLSON NE SHORE TENASILLAHE ISLAND | A-87-6 | SHORE SHORE CLEAN | VISUAL SURVEY |
| 27 MAR 1120 | 108 | NOAA/CARLSON 100 YDS OFFSHORE TENASILLAHE ISLAND | A-87-7 | SURFACE WATER OCCASIONAL SMALL OIL STREAKS ON WATER SURFACE | VISUAL SURVEY |

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|---|---|---|---|---|---|
| | | NOTES | | | |
| 27 MAR 1125 | 109 | NOAA/CARLSON<br>CROSS-CHANNEL TENASILLAHE ISLAND TO ELOCHOMAN SL. | A-87-8 | WATER COLUMN<br>OIL FOUND - NET APPEARED TO REMAIN OFF BOTTOM DURING TOW. | PLANKTON TOW |
| | | DROPLET-SIZED OILPARTICLES FOUND SCATTERED THROUGHOUT NET | | | |
| 27 MAR 1150 | 110 | NOAA/CARLSON<br>OFF ELOCHOMAN SLOUGH | A-87-9 | SURFACE WATER | JAR (WATER SAMPLE) |
| | | BROWN SCUM COLLECTED IN JAR, 3 PHOTOS TAKEN | | | |
| 27 MAR 1240 | 111 | NOAA/CARLSON<br>OFF ELOCHOMAN SLOUGH | A-87-10 | SURFACE WATER | WHEATON WATER SAMPLER |
| | | WATER DEPTH 40' | | | |
| 27 MAR 1208 | 112 | NOAA/CARLSON<br>OFF ELOCHOMAN SLOUGH | A-87-11 | SURFACE WATER | WHEATON WATER SAMPLER |
| | | WTER DEPTH 40' | | | |
| 27 MAR 1210 | 113 | NOAA/CARLSON<br>OFF ELOCHOMAN SLOUGH | A-87-12 | SURFACE WATER | WHEATON WATER SAMPLER |
| | | | | WATER DEPTH 40' | |
| 27 MAR 1216 | 114 | NOAA/CARLSON<br>OFF ELOCHOMAN LOUGH | A-87-13 | WATER | WHEATON WATER SAMPLER |
| | | SAMPLE DEPTH 3' | | WATER DEPTH 40' | |
| 27 MAR 1219 | 115 | NOAA/CARLSON<br>OFF ELOCHOMAN SLOUGH | A-87-14 | WATER | WHEATON WATER SAMPLER |
| | | 3' SAMPLE DEPTH | | WATER DEPTH 40' | |
| 27 MAR 1221 | 116 | NOAA/CARLSON<br>OFF ELOCHOMAN SLOUGH | A-87-15 | WATER | WHEATON WATER SAMPLER |
| | | 3' SAMPLE DEPTH | | | |
| 27 MAR 1235 | 117 | NOAA/CARLSON<br>MOUTH OF STEAMBOAT SLOUGH | A-87-16 | BOTTOM<br>NO OIL | CANNONBALL |
| | | 6' WATER DEPTH | | | |
| 27 MAR 1239 | 118 | NOAA/CARLSON<br>200 YDS TOWARD CHANNEL OFF STEAMBOAT SLOUGH | A-87-17 | BOTTOM<br>NO OIL | CANNONBALL |
| | | 55' WATER DEPTH | | | |
| 27 MAR 1241 | 119 | NOAA/CARLSON<br>MID-CHANNEL OF STEAMBOAT SLOUGH, 100 YDS NORTH* | A-87-18 | BOTTOM<br>NO OIL | CANNONBALL |
| | | WATER DEPTH 62' | | *OF BUOY #36 | |
| 27 MAR 1247 | 120 | NOAA/CARLSON<br>3/4 ACROSS CHANNEL OF STEAMBOAT SLOUGH | A-87-19 | BOTTOM<br>NO OIL | CANNONBALL |
| | | | | WATER DEPTH 16' | |
| 27 MAR 1300 | 121 | NOAA/CARLSON<br>MOUTH OF STEAMBOAT SLOUGH AT RANGE MARK | A-87-20 | SURFACE WATER | WHEATON WATER SAMPLER |
| | | WATER DEPTH 25' | | | |
| 27 MAR 1307 | 122 | NOAA/CARLSON<br>MOUTH OF STEAMBOAT SLOUGH AT RANGE MARK | A-87-21 | WATER | WHEATON WATER SAMPLER |
| | | SURFACE SAMPLE | | WATERDEPTH 25' | |
| 27 MAR 1302 | 123 | NOAA/CARLSON<br>MOUTH OF STEAMBOAT SLOUGH AT RANGE MARK | A-87-22 | WATER | WHEATON WATER SAMPLER |
| | | SUBSURFACE DEPTH 3' | | WATER DEPTH 25' | |
| 27 MAR 1303 | 124 | NOAA/CARLSON<br>MOUTH OF STEAMBOAT SLOUGH AT RANGE MARK | A-87-23 | WATER | WHEATON WATER SAMPLER |
| | | SUBSURFCE DEPTH 3' | | WATER DEPTH 25' | |
| 27 MAR 1428 | 125 | NOAA/CARLSON<br>NORTH EDGE OF CHANNEL - OFF ELOCHOMAN SLOUGH | A-87-24 | BOTTOM<br>NO OIL | CANNONBALL |
| | | WATER DEPTH 50' | | | |
| 27 MAR 1427 | 126 | NOAA/CARLSON<br>NORTH-MID CHANNEL OFF ELOCHOMAN SLOUGH | A-87-25 | BOTTOM<br>NO OIL | CANNONBALL |
| | | WATER DEPTH 60' | | | |

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|---|---|---|---|---|---|
| 27 MAR 1430 | 127 | NOAA/CARLSON<br>MID-CHANNEL OFF ELOCHOMAN SLOUGH<br>WATER DEPTH 62' | A-87-26 | BOTTOM<br>NO OIL | CANNONBALL |
| 27 MAR 1435 | 128 | NOAA/CARLSON<br>SOUTH SIDE OF CHANNEL OF ELOCHOMAN SLOUGH<br>WATER DEPTH | A-87-27 | BOTTOM<br>NO OIL<br>*100 YARDS FROM TENASILLAHE ISLAND | CANNONBALL |
| 27 MAR 1455 | 129 | NOAA/CARLSON<br>ACROSS ENTIRE CHANNEL OF ELOCHOMAN SLOUGH<br>THAT FOUND EARLIER IN THE DAY. PHOTO OF NET TAKEN. | A-87-28 | WATER COLUMN<br>OIL FOUND. CONTENTSWERE SMALL DROPLETS OF OIL SIMILAR TO | PLANKTON TOW |
| 27 MAR 1510 | 130 | NOAA/CARLSON<br>OFF MOUTH OF ELOCHOMAN SLOUGH<br>IN WATER, ON SMALL AMOUNT OF SEDIMENT OR ON GRAB. | A-87-29 | BOTTOM<br>3 TRIES, VERY LITTLE SEDIMENT PICKET UP. NO EVIDENCE OF OIL | CLAMSHELL GRAB |
| 27 MAR 1526 | 131 | NOAA/CARLSON<br>DAYMARK 37 TO STEAMBOAT SLOUGH<br>GLOBLET. | A-87-30 | SHORE AND WATER PHOTOS<br>SCATTERED OILING AT HIGH WATER MARK. SCUM ON WATER WITH OIL | VISUAL SURVEY |
| 27 MAR 1645 | 132 | NOAA/SIGRIST<br>HAMMOND MOORING BASIN, FLOAT D, EAST EXTENSION<br>5 PHOTOS (MARKED C-87-001) | C-87-1 | SURFACE WATER<br>WATER, OIL,DEBRIS,MODERATE OIL. OIL IS OF LIGHT CONSISTENCY. | JAR (SURFACE WATER)/PHOTO |
| 27 MAR 1700 | 133 | NOAA/SIGRIST<br>SW CORNER, HAMMOND MOORING BASIN<br>NOT REPRESENTATIVE OF OILING ON RIPRAP - ISOLATED. | C-87-2 | ROCK, FROM RIPRAP<br>SMALL ROCK WITHOIL GLOB<br>2 PHOTOGRAPHS, (MARKED C-87-002) | HAND SPECIMEN/PHOTO |
| 27 MAR 1650 | 134 | NOAA/SIGRIST<br>LAUNCHING RAMP - HAMMOND MOORING BASIN<br>HEAVY OIL | C-87-3 | OIL GLOB OFF RAMP<br>OIL SAMPLE (GLOB) IN JAR<br>1 PHOTO (MARKED C-87-003) | HAND SPECIMEN IN JAR/PHOTO |
| 27 MAR 1730 | 135 | NOAA/SIGRIST<br>HAMMOND MOORING BASIN, SOUTH SIDE<br>OIL GLOBS 12-15" (MAX DIAMETER), HEAVY IN 30 SQ. FT. AREA OILING ON LOG | C-87-4 | OIL ON BEACH<br>6 PHOTOGRAPHS, OIL GLOBS ON BEACH. | PHOTOGRAPH |
| 27 MAR 1540 | 136 | NOAA/SIGRIST<br>HAMMOND MOORING BASIN, NORTHWARD VIEW<br>DISTRESSED BIRDS NOTED NEAR SAND FLATS. REPORT PROVIDED BY HARBORMASTER, JACK ZIMMERMAN. | C-87-5 | PHOTOS OF AREA<br>2 PHOTOGRAPHS,SHOWING AREA | PHOTOGRAPH |
| 28 MAR 0929 | 137 | NOAA/KUMMERLOWE<br>TAYLOR SANDS SEINE HOUSE<br>DEPTH 20 FT. | B-88-1 | BOTTOM<br>CLEAN - THREE DROPS | CANNONBALL |
| 28 MAR 0942 | 138 | NOAA/KUMMERLOWE<br>TAYLOR SANDS SEINE HOUSE<br>20 FT. DEPTH - SURFACE SAMPLE | B-88-2 | SURFACE WATER | WHEATON WATER SAMPLER |
| 28 MAR 0943 | 139 | NOAA/KUMMERLOWE<br>TAYLOR SANDS SEINE HOUSE<br>50 FT. DEPTH - SURFACE SAMPLE | B-88-3 | SURFACE WATER | WHEATON WATER SAMPLER |
| 28 MAR 0944 | 140 | NOAA/KUMMERLOWE<br>TAYLOR SANDS SEINE HOUSE<br>WATER DEPTH 20 FT. - SURFACE SAMPLE- | B-88-4 | SURFACE WATER | WHEATON WATER SAMPLER |
| 28 MAR 0952 | 141 | NOAA/KUMMERLOWE<br>TAYLOR SANDS SEINE HOUSE<br>60 FT. WATER DEPTH | B-88-5 | 5 FT FROM BOTTOM<br>LIGHT AMOUNT DETRITUS - NO OIL | PLANKTON TOW |
| 28 MAR 1027 | 142 | NOAA/KUMMERLOWE<br>RICE ISLAND - SW TIP<br>WATER DEPTH 10 FT. 1 SMALL TR BALL OBSERVED | B-88-6 | BOTTOM<br>CLEAN | CANNONBALL |
| 28 MAR 1029 | 143 | NOAA/KUMMERLOWE<br>RICE ISLAND - SW TIP<br>WATER DEPTH 10 FT. | B-88-7 | SURFACE WATER | WHEATON WATER SAMPLER |
| 28 MAR 1031 | 144 | NOAA/KUMMERLOWE<br>RICE ISLAND - SW TIP<br>WATER DEPTH 10 FT. | B-88-8 | SURFACE WATER | WHEATON WATER SAMPLER |

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| | | NOTES ..... | | | |
| 28 MAR 1052 | 145 | NOAA/KUMMERLOWE<br>RICE ISLAND - SW TIP<br>WATER DEPTH 10 FT. | B-88-9 | SURFACE WATER | WHEATON WATER SAMPLER |
| 28 MAR 1038 | 146 | NOAA/KUMMERLOWE<br>RICE ISLAND - SW TIP<br>WATER DEPTH 10 FT. | B-88-10 | 5 FT. FROM BOTTOM<br>SAND - ABOUT 1 DOZ. 1-MM SIZED TAR BALLS<br>ABOUT 1 DOZ. 1-MM SIZED TAR BALLS | PLANKTON TOW |
| 28 MAR 1044 | 147 | NOAA/KUMMERLOWE<br>MILLER SANDS - WEST TIP<br>WATER DEPTH 14 FT. | B-88-11 | BOTTOM<br>CLEAN 3-DROPS | CANNONBALL/DIAPER |
| 28 MAR 1046 | 148 | NOAA/KUMMERLOWE<br>MILLER SANDS - WESTERN TIP<br>WATER DEPTH 14 FT. | B-88-12 | SURFACE WATER | WHEATON WATER SAMPLER |
| 28 MAR 1048 | 149 | NOAA/KUMMERLOWE<br>MILLER SANDS - WESTERN TIP<br>WATER DEPTH 14 FT. | B-88-13 | SURFACE WATER | WHEATON WATER SAMPLER |
| 28 MAR 1050 | 150 | NOAA/KUMMERLOWE<br>MILLER SANDS - WESTERN TIP<br>WATER DEPTH 14 FT. | B-88-14 | SURFACE WATER | WHEATON WATER SAMPLER |
| 28 MAR 1056 | 151 | NOAA/KUMMERLOWE<br>MILLER SANDS - WESTERN TIP<br>AVERAGE. WATER DEPTH 14 FT. 2 PHOTOS TAKEN. | B-88-15 | 5 FT. FROM BOTTOM<br>ONE SMALL TARBALL EVERY SQUARE INCH. TAR BALL SIZE 1 MM | PLANKTON TOW |
| 28 MAR 1114 | 152 | NOAA/KUMMERLOWE<br>JIM CROW SANDS - WESTERN TIP<br>WATER DEPTH 20 FT. 3 DROPS | B-88-16 | BOTTOM<br>10 MM SIZED TARBALLS | CANNONBALL |
| 28 MAR 1120 | 153 | NOAA/KUMMERLOWE<br>JIM CROW SANDS - WESTERN TIP<br>WATER DEPTH 20 FT. | B-88-17 | BOTTOM | CLAM SHELL GRAB |
| 28 MAR 1123 | 154 | NOAA/KUMMERLOWE<br>JIM CROW SANDS<br>WATER DEPTH 20 FT. | B-88-18 | SURFACE WATER | WHEATON WATER SAMPLER |
| 28 MAR 1124 | 155 | NOAA/KUMMERLOWE<br>JIM CROW SANDS - WESTERN TIP<br>WATER DEPTH 20 FT. | B-88-19 | SURFACE WATER | WHEATON WATER SAMPLER |
| 28 MAR 1125 | 156 | NOAA/KUMMERLOWE<br>JIM CROW SANDS - WESTERN TIP<br>WATER DEPTH 20' | B-88-20 | SURFACE WATER | WHEATON WATER SAMPLER |
| 28 MAR 1131 | 157 | NOAA/KUMMERLOWE<br>JIM CROW SANDS - WESTERN TIP<br>WATER DEPTH 20 FT. 1 SMALL TARBALL | B-88-21 | 5 FT. FROM BOTTOM<br>TARBALL SIZE AVERAGE 1MM - DISTRIBUTED EVERY SQ. CENTIMETER<br>2 PHOTOS TAKEN. | PLANKTON TOW |
| 28 MAR 1155 | 158 | NOAA/KUMMERLOWE<br>NORTHERN TIP OF FITZPATRICK ISLAND<br>PICKED UPT ARBALL AT HIGH WATER MARK-BLACK SAND BEACH- | B-88-22 | BEACH SURVEY<br>NO SHEEN OBSERVED ON SHORELINE | HAND SCOOP |
| 28 MAR 1246 | 159 | NOAA/KUMMERLOWE<br>NORTHERN ENTRANCE TO ELOCHOMAN SLOUGH-MID-CHANNEL<br>NET WAS LOST WHILE BRING IT IN - WAS ABLE TO SEE 3/4 OF NET BEFORE LOST | B-88-23 | 5 FT. FROM BOTTOM<br>SMALL TARBALLS AVERAGE SIZE 1 MM - DISTRIBUTED EVERY SQ. CM | PLANKTON TOW |
| 28 MAR 1051 | 160 | NOAA/CARLSON<br>WARRIOR ROCK, ST. HELENS (NEARSHORE) | A-88-1 | BOTTOM<br>NEGATIVE | CANNONBALL |
| 28 MAR 1054 | 161 | NOAA/CARLSON<br>WARRIOR ROCK, ST. HELENS (50 YDS. OUT AND ABEAM) | A-88-2 | BOTTOM<br>NEGATIVE | CANNONBALL |
| 28 MAR 1055 | 162 | NOAA/CARLSON<br>WARRIOR ROCK, ST. HELENS (MID-CHANNEL, ABEAM) | A-88-3 | SURFACE WATER | JAR (WATER SURFACE) |

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|---|---|---|---|---|---|
| 28 MAR 1056 | 163 | NOAA/CARLSON WARRIOR ROCK, ST. HELENS (MID-CHANNEL, ABEAM) | A-88-4 | SURFACE WATER | JAR (WATER SURFACE) |
| 28 MAR 1056 | 164 | NOAA/CARLSON WARRIOR ROCK, ST. HELENS (MID-CHANNEL, ABEAM) | A-88-5 | SURFACE WATER | JAR (WATER SURFACE) |
| 28 MAR 1058 | 165 | NOAA/CARLSON WARRIOR ROCK, ST. HELENS (ABEAM, DUE WEST OF BUOY 4 | A-88-6 | BOTTOM NEGATIVE | CANNONBALL |
| 28 MAR 1103 | 166 | NOAA/CARLSON WARRIOR ROCK, ST. HELENS (ABOUT 200 YDS ENE OF) | A-88-7 | BOTTOM SMALL OIL DROPLETS WERE NOTED | CANNONBALL ON DIAPER |
| 28 MAR 1108 | 167 | NOAA/CARLSON WARRIOR ROCK, ST. HELENS (200 YDS ENE OF) | A-88-8 | BOTTOM NEGATIVE | CANNONBALL |
| 28 MAR 1114 | 168 | NOAA/CARLSON BUOY #4, ST. HELENS, MID-CHANNEL BETWEEN BUOY AND* *SOUTH SHORE. | A-88-9 | BOTTOM NEGATIVE | CANNONBALL |
| 28 MAR 1118 | 169 | NOAA/CARLSON WARRIOR ROCK, ST. HELENS (ABOUT 200 YDS ENE OF) | A-88-10 | BOTTOM SMALL OIL DROPLETS WERE NOTED | CANNONBALL ON CLOTH |
| 28 MAR 1130 | 170 | NOAA/CARLSON WARRIOR ROCK, ST. HELENS (ABOUT 200 YDS ENE OF) | A-88-11 | BOTTOM NO OIL WAS VISIBLE | CLAMSHELL GRAB |
| 28 MAR 1201 | 171 | NOAA/CARLSON CHANNEL BETWEEN DM 73 AND 72, ST. HELENS | A-88-12 | 2' TO 6' ABOVE BOTTOM SMALL OIL DROPLETS WERE ONSERVED ON THE NET. | PLANKTON FISH TOW, CANNONBALL |
| 28 MAR 1218 | 172 | NOAA/CARLSON CHANNEL BETWEEN DM 73 AND 72, ST. HELENS | A-88-13 | 2' TO 6' ABOVE BOTTOM SMALL OIL DROPLETS WERE OBSERVED ON NET SURFACE. PHOTO TAKEN | PLANKTON TOW AND CANNONBALL |
| 28 MAR 1247 | 173 | NOAA/CARLSON NEAR OR. SHORE ACROSS FROM W . TIP OF ST. HELENS* *BAR | A-88-14 | BOTTOM NEGATIVE | CANNONBALL |
| 28 MAR 1251 | 174 | NOAA/CARLSON MID-CHANNEL BETWEEN W. TIP OF ST. HELENS BAR AND* *OREGON SHORE | A-88-15 | BOTTOM NEGATIVE | CANNONBALL |
| 28 MAR 1300 | 175 | NOAA/CARLSON SOUTHERN SHORE OF ST, HELENS BAR, ABOUT 100 YDS* | A-88-16 | SHORELINE POSITIVE OILING OBSERVED. PHOTO TAKEN *FROM WEST TIP | VISUAL SURVEY |
| 28 MAR 1301 | 176 | NOAA/CARLSON SO, SHORE OF ST. HELENS BAR ABOUT 100 YDS FROM * | A-88-17 | SHORELINE POSITIVE OILING OBSERVED. PHOTO TAKEN *WEST TIP | VISUAL SURVEY |
| 28 MAR 1304 | 177 | NOAA/CARLSON SO. SHORE OF ST. HELENS BAR ABOUT 100 YDS FROM* *WEST TIP | A-88-18 | SHORELINE POSITIVE OILING OBSERVED | KNIFE |
| 28 MAR 1329 | 178 | NOAA/CARLSON CHANNEL BETWEEN ST. HELENS BAR AND OR SHORELINE | A-88-19 | BOTTOM NEGATIVE | CANNONBALL |
| 28 MAR 1330 | 179 | NOAA/CARLSON CHANNEL BETWEEN ST. HELENS BAR AND OR SHORELINE | A-88-20 | BOTTOM SMALL OIL DROPLETS OBSERVED ON CLOTH | CANNONBALL |
| 28 MAR 1332 | 180 | NOAA/CARLSON CHANNEL BETWEEN ST. HELENS BAR AND OR SHORELINE | A-88-21 | BOTTOM NEGATIVE | CANNONBALL |

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| 28 MAR 1335 | 181 | NOAA/CARLSON<br>CHANNEL BETWEEN ST. HELENS BAR AND OR SHORELINE | A-88-22 | BOTTOM<br>NEGATIVE | CANNONBALL |
| 28 MAR 1337 | 182 | NOAA/CARLSON<br>CHANNEL BETWEEN ST.HELENS BAR AND OR SHORELINE | A-88-23 | BOTTOM<br>NEGATIVE | CANNONBALL |
| 28 MAR 1340 | 183 | NOAA/CARLSON<br>W. END OF BOAT DOCK ON SO. SIDE OF ST. HELENS BAR | A-88-24 | BOTTOM<br>NEGATIVE | CANNONBALL |
| 28 MAR 1345 | 184 | NOAA/CARLSON<br>EAST TIP OF ST. HELENS BAR | A-88-25 | BOTTOM<br>NEGATIVE | CANNONBALL |
| 28 MAR 1357 | 185 | NOAA/CARLSON<br>COVE AREA WSW OF WARRIOR ROCK, ST. HELENS | A-88-26 | BOTTOM<br>NEGATIVE | CANNONBALL |
| 21 MAR 1100 | 186 | NOAA/EMMETT<br>GRAYS BAY,OFF HARRINGTON PT.<br>QUALITATIVE SAMPLE, PHOTO | HM-321-1 | BEACH OIL GRAB | BY HAND |
| 21 MAR 1100 | 187 | NOAA/EMMETT<br>GRAYS BAY, OFF HARRINGTON PT.<br>QUANTITATIVE SEDIMENT CORE, PHOTO | HM-321-2 | BEACH SEDIMENT | STAINLESS STEEL CORER |
| 21 MAR 1100 | 188 | NOAA/EMMETT<br>GRAYS BAY, OFF HARRINGTON PT.<br>QUANTITATIVE SEDIMENT CORE | HM-321-3 | BEACH SEDIMENT | STAINLESS STEEL CORER |
| 21 MAR 1100 | 189 | NOAA/EMMETT<br>GRAYS BAY, OFF HARRINGTON PT.<br>QUANTITATIVE SEDIMENT CORE | HM-321-4 | BEACH SEDIMENT | STAINLESS STEEL CORER |
| 21 MAR 1100 | 190 | NOAA/EMMETT<br>GRAYS BAY, OFF HARRINGTON PT.<br>QUANTITATIVE SEDIMENT CORE | HM-321-5 | BEACH SEDIMENT | STAINLESS STEEL CORER |
| 21 MAR 1100 | 191 | NOAA/EMMETT<br>GRAYS BAY, OFF HARRINGTON PT.<br>QUANTITATIVE SEDIMENT CORE | HM-321-6 | BEACH SEDIMENT | STAINLESS STEEL CORER |
| 22 MAR 1330 | 192 | NOAA/MUIR, EMMETT<br>TIDAL FLAT W. OF WALLACUT RIVER IN BAKER BAY<br>BLOBS OF OIL IN GRASS AND AT HIGH TIDE LINE | HM-322-40 | OIL ON BEACH | BY HAND - PHOTOS ALSO TAKEN |
| 22 MAR 1345 | 193 | NOAA/MUIR, EMMETT<br>BEACH EAST OF JETTY A IN BAKER BAY<br>BLOBS OF OIL AT HIGH TIDE LINE | HM-322-41 | OIL ON BEACH | BY HAND - PHOTOS ALSO TAKEN |
| 22 MAR 1400 | 194 | NOAA/MUIR, EMMETT<br>LONG BEACH NEAR SEAVIEW, WASH.<br>BLOBS OF OIL IN SURF LINE AND AT HIGH TIDE LINE | HM-322-42 | OIL ON BEACH | BY HAND-PHOTOS ALSO TAKEN |
| 22 MAR 1254 | 195 | NOAA/COLEY<br>BEACH AT NMFS FACILITY, HAMMOND, OR<br>A NUMBER OF GLOBS ON BEACH | HM-322-50 | OIL ON BEACH | BY HAND - PHOTO TAKEN |
| 22 MAR 1403 | 196 | NOAA/COLEY<br>SE OF DESDEMONA SANDS MARKER (FI 4SEC 23 FT.)<br>COLLECTED SOME FISH AND A DUNGENESS CRAB | HM-322-30 | SUBTIDAL BOTTOM - OIL SAMPLE 5-M SEMI-BALLON SHRIMP TRAWL<br>COLLECTED SOME OIL IN NET DURING A FIVE MINUTE TRAWL, | |
| 22 MAR 1512 | 197 | NOAA/COLEY<br>NE OF BUOY "33" (ASTORIA, OR)<br>COLLECTED SOME FISH | HM-322-31 | SUBTIDAL BOTTOM - OIL SAMPLE 5-M SEMI-BALLON SHRIMP TRAWL<br>COLLECTED SOME OIL IN NET DURING A FIVE-MINUTE TRAWL, | |
| 22 MAR 1403 | 198 | NOAA/COLEY<br>SE OF DESDEMONA SANDS MARKER (FI 4SEC 23 FT.)<br>COLLECTED SOME FISH AND A DUNGENESS CRAB | HM-322-32 | SUBTIDAL BOTTOM - FISH, CRAB 5-M SEMI-BALLON SHRIMP TRAWL<br>COLLECTED SOME OIL IN NET DURING FIVE-MINUTE TRAWL, | |

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| | | NOTES | | | |
| 22 MAR 1435 | 199 | NOAA/COLEY<br>UPSTREAMOF ASTORIA-MEGLER BRIDGE,WASH. SIDE<br>TRAWL, COLLECTED SOME FISH | HM-322-33 | SUBTIDAL BOTTOM - FISH<br>COLLECTED SMALLAMOUNT OF OIL IN NET DURING A FIVE-MINUTE | 5-M SEMI-BALLON SHRIMP TRAWL |
| 22 MAR 1512 | 200 | NOAA/COLEY<br>NE OF BUOY "33" (ASTORIA, OR)<br>COLLECTED SOME FISH | HM-322-34 | SUBTIDAL BOTTOM - FISH<br>COLLECTED SOME OIL IN NET DURING A FIVE-MINUTE TRAWL, | 5-M SEMI-BALLON SHRIMP TRAWL |
| 22 MAR 1543 | 201 | NOAA/COLEY<br>SHIP CHANNEL NEAR BUOY "27" (TANSY PT.)<br>TRAWL, COLLECTED SOME FISH | HM-322-35 | SUBTIDAL BOTTOM - FISH<br>COLLECTED SMALL AMOUNT OF OIL IN NET DURING A FIVE-MINUTE | 5-M SEMI-BALLON SHRIMP TRAWL |
| 22 MAR 1536 | 202 | NOAA/DAVIS<br>LOWER END OF MILLER SANDS<br>*POSSIBLY NOT OIL, COLLECTED ON BEACH | HM-322-20 | BLACK-COLORED SAND* | COLLECTED BY HAND W/SMALL BOAT |
| 22 MAR 1455 | 203 | NOAA/DAVIS<br>SE PART OF MCCGREGOR ISLAND | HM-322-21 | OIL ON BEACH<br>OILGLOBS ON MCGREGORISLAND, OIL GLOBS AND SLICK ON WATER | COLLECTED BY HAND W/SMALL BOAT |
| 22 MAR 1431 | 204 | NOAA/DAVIS<br>SOUTH CHANNEL,DOLHIN "10" (FI 4 SEC 16 FT) | HM-322-22 | OIL ON BEACH<br>OIL GLOBS ON BEACH, OIL SLICK ON WATER AROUND DOLPHIN "10" | COLLECTED BY HAND W/SMALL BOAT |
| 23 MAR 1130 | 205 | NOAA/COLEY<br>CLATSOP SPIT<br>5-6 CM SQ. GLOBS ON BEACH FROM WATER LINE TO HIGH WATER LINE | HM-323-1 | OIL ON BEACH | BY HAND - PHOTO TAKEN |
| 26 MAR 1432 | 206 | NOAA/COLEY<br>HAMMOND BEACH NEAR NAV. MARKER NO. 26<br>GLOBS ON BEACH AT HIGH TIDE LINE | HM-326-1 | OIL ON BEACH | BY HAND - PHOTO TAKEN |
| 27 MAR 0730 | 207 | NOAA/COLEY<br>END OF WALKWAY, NMFS FIELD STATION, HAMMOND, OR<br>0730 (27 MARCH) | HM-327-10 | SUBTIDAL BOTTOM - DUNG. CRABS MODIFIED COMM. DUNG. CRAB POT<br>CAPTURED TWO DUNGENESS CRABS BETWEEN 1700 (26 MARCH) AND | |
| 27 MAR 1230 | 208 | NOAA/COLEY<br>WALKWAY (BEACH), NMFS-HAMMOND | HM-87-20 | BIRD - SEAGULL<br>DEAD SEAGULLHAD SMALL AMOUNT OF OIL ON FEATHERS | COLLECTED BY HAND |
| 27 MAR 1200 | 209 | NOAA/EMMETT<br>HAMMOND MOORING BASIN<br>WERE ACTING TROUBLED (I.E., THEY WERE ON BEACH). LARGE OIL SLICK IN BASIN, NO COLL'NS.BIRDS:CANVASBACK,M | HM-87-21 | BIRDS<br>APPROXIMATELY 38 BIRDS WITH MINIMAL OIL CONTAMINATION, ALL | VISUAL SURVEY |
| 27 MAR 1220 | 210 | NOAA/COLEY<br>WALKWAY, NMFS - HAMMOND<br>THEY WERE CAPABLE OF FLYING. | HM-87-22 | BIRD - SEAGULL<br>SAW THREE SEAGULLS THAT APPEARED TO BE STAINED WITH OIL. | VISUAL SURVEY |
| 27 MAR 0800 | 211 | NOAA/EMMETT<br>OFF ASTORIA COMMERCIAL PIERS, STA. X<br>NO SAMPLE FOR HAZMAT,SAMPLE UNDER CONTRACT (ENVIROSCIENCE) | HM-87-30 | BOTTOM<br>SEDIMENT W/WTER AND TARBALLS, 1 CM. MODERATE. | VAN VEEN GRAB, 1 M. |
| 27 MAR 0830 | 212 | NOAA/EMMETT<br>OFF ASTORIA COMMERCIAL PIERS, STA. ZZ<br>RETAINED FOR HAZMAT,SAMPLE UNDER CONTRACT (ENVIROSCIENCE) | HM-87-31 | BOTTOM<br>SEDIMENT WITH WATER, LIGHT OILING ON SAMPLE. NO SAMPLE | VAN VEEN GRAB, 1M |
| 27 MAR 0900 | 213 | NOAA/EMMETT<br>OFF ASTORIA COMMERCIAL PIERS, STA. A<br>NO OILING | HM-87-32 | BOTTOM<br>SEDIMENT WITH WATER | VAN VEEN GRAB 1M |
| 27 MAR 0930 | 214 | NOAA/EMMETT<br>OFF ASTORIA COMMERCIAL PIERS, STA. B<br>NO OILING | HM-87-33 | BOTTOM<br>SEDIMENT WITH WATER | VAN VEEN GRAB 1M |
| 27 MAR 1000 | 215 | NOAA/EMMETT<br>OFF ASTORIA COMMERCIAL PIERS, STA. C<br>NO OILING | HM-87-34 | BOTTOM<br>SEDIMENT WITH WATER | VAN VEEN GRAB 1M |
| 27 MAR 1030 | 216 | NOAA/EMMETT<br>OFF ASTORIA COMMERCIAL PIERS<br>NO SAMPLE RETAINED FOR HAZMAT, SAMPLE UNDER CONTRACT | HM-87-35 | BOTTOM<br>SEDIMENT WITH WATER AND OIL GLOB ON SEDIMENT.<br>(ENVIROSCIENCE) | VAN VEEN GRAB, 1M |

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| DATE TIME | SEQ. # | AGENCY / NAME LOCATION(S) | FIELD TAG# | WHAT WAS SAMPLED RESULTS | METHOD USED |
|---|---|---|---|---|---|
| | | NOTES ..... | | | |
| 28 MAR 0925 | 217 | NOAA/KAISER<br>TRAWL ST. #7, 300 YDS E OF DESDEMONA SANDS LIGHT | HM-88-1 | BOTTOM<br>NO OIL | BOTTOM TRAWL |
| | | FISH SAMPLE HELD BY NMFS, HAMMOND | | SEE SEQ# 00196 & 00198 (6 PHOTOS OF TRAWL OPE | |
| 28 MAR 0950 | 218 | NOAA/KAISER<br>TRAWL ST. #12, OFF PT. ELLICE, E OF 3RD SPAN OF BR | HM-88-2 | BOTTOM<br>NO OIL | BOTTOM TRAWL |
| | | FISH SAMPLE HELD BY NMFS-HAMMOND. SEE SEQ #00199 | | | |
| 28 MAR 1030 | 219 | NOAA/KAISER<br>TRAWL ST. #10, OFF ASTORIA, 1/4 MI NE BUOY #33 | HM-88-3 | BOTTOM<br>NO OIL | BOTTOM TRAWL |
| | | FISH SAMPLE HELD BY NMFS-HAMMOND. SEE SEQ #'S 00197 & 00200 | | | |
| 28 MAR 1100 | 220 | NOAA/KAISER<br>TRAWL ST. #8, OFF HAMMOND, 1/2 MI W BUOY #27 | HM-88-4 | BOTTOM<br>NO OIL | BOTTOM TRAWL |
| | | FISH SAMPLE HELD BY NMFS-HAMMOND, SEE SEQ #00201 | | | |
| 28 MAR 1100 | 221 | NOAA/KAISER<br>TRAWL STATIONS #7 TO #12, TO 10, TO 8, AND MARINA | HM-88-5 | SURFACE WATER<br>NO OIL | VISUAL SURVEY |
| | | VISUAL TRANSIT | | | |
| 28 MAR 0915 | 222 | NOAA/KAISER<br>HAMMOND MARINA BREAKWATER | HM-88-6 | BIRD - SEAGULL<br>ONE OILED SEAGULL | VISUAL SURVEY |
| 28 MAR 0915 | 223 | NOAA/KAISER<br>HAMMOND MARINA | HM-88-7 | SURFACE WATER<br>SILVER SHEEN COVERING PORTIONS OF HAMMOND MARINA | VISUAL SURVEY |
| 28 MAR 1600 | 224 | NOAA/KAISER<br>PIGEON BLUFF | HM-88-8 | SHORELINE<br>OIL CONTAMINATION (VARYING AMOUNTS) OF SHORELINE | PHOTOGRAPHS |
| | | ELEVEN (11) PHOTOS | | | |
| 28 MAR 1600 | 225 | NOAA/KAISER<br>PIGEON BLUFF | HM-88-9 | SHORE | JAR (HAND SPECIMEN) |
| | | OIL GLOB SAMPLE IN JAR | | | |
| 28 MAR 1630 | 226 | NOAA/EMMETT<br>MUDFLAT WAS OF HARRINGTON PTL | HM-88-10 | MUDFLAT SEDIMENT<br>CORE TAKEN, QUANTITATIVE | STAINLESS CORER |
| | | NO VISIBLE OIL | | | |
| 28 MAR 1630 | 227 | NOAA/EMMETT<br>MUDFLAT WEST OF HARRINGTON PT. | HM-88-11 | MUDFLAT SEDIMENT<br>CORE TAKEN QUANTITATIVE | STAINLESS STEEL CORER |
| | | NO OIL VISIBLE ON MAT | | | |
| 28 MAR 1630 | 228 | NOAA/EMMETT<br>MUD FLAT WEST OF HARRINGTON PT | HM-88-12 | MUDFLAT SEDIMENT<br>SEDIMENT TAKEN, QUANTITATIVE | STAINLESS CORER |
| | | NO OIL VISIBLE ON FLAT | | | |
| 28 MAR 1630 | 229 | NOAA/EMMETT<br>MUD FLAT WEST OF HARRINGTON PT. | HM-88-13 | CORBICULA MANILENSIS<br>PICKED UP LARGE CORBICULA (ALIVE) ON SEDIMENT SURFACE | HAND |
| | | NO OIL ON MUD FLAT | | | |
| 29 MAR 0815 | 230 | NOAA/COLEY<br>EAST OF WALKWAY, NMFS FIELD STATION, HAMMOND, ORE. | HM-89-1 | BIRD - WESTERN GREBE<br>OIL ON THE FEATHER OF THE DEAD GREBE | HAND |
| 20 MAR | 231 | USCG/MOTT<br>MOBILOIL TANK 1 | 1 | CARGO | HAND SPECIMEN |
| 20 MAR | 232 | USCG/MOTT<br>MOBILOIL TANK 3 | 2 | CARGO | HAND SPECIMEN |
| 20 MAR | 233 | USCG/MOTT<br>MOBILOIL TANK 4 | 3 | CARGO | HAND SPECIMEN |
| 28 MAR 1345 | 234 | WDF/MOORE<br>1/4 MILE N. OF OCEAN PARK BEACH ACCESS | OP-28-3/84 | BEACH TARBALL | |
| | | CALL JAN MOORE (206)753-3219 FOR DETAILS | | | |

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| DATE / TIME | SEQ. # | AGENCY / NAME / LOCATION(S) / NOTES | FIELD TAG# | WHAT WAS SAMPLED / RESULTS | METHOD USED |
|---|---|---|---|---|---|
| 29 MAR 1300 | 235 | NOAA/KAISER<br>1/4 MILE NORTH RICE ISLAND TO HARRINGTON POINT<br>NET TWISTED | A-89-1 | BOTTOM<br>NO OIL, NO SAMPLES | BOTTOM TRAWL |
| 29 MAR 1320 | 236 | NOAA/KAISER<br>BEACH NORTH OF RICE ISLAND TO 1/4 MILE OFF *<br>*HARRINGTON POINT | A-89-2 | BOTTOM<br>NO OIL, NO SAMPLE | BOTTOM TRAWL |
| 29 MAR 1405 | 237 | NOAA/KAISER<br>MID-CHANNEL ROCKY POINT TO | A-89-3 | BOTTOM<br>NO OIL, NO SAMPLE | BOTTOM TRAWL |
| 29 MAR 1438 | 238 | NOAA/KAISER<br>CROSS-CHANNEL, GRAYS POINT | A-89-4 | BOTTOM<br>NO OIL, NO SAMPLE | BOTTOM TRAWL |
| 29 MAR 1520 | 239 | NOAA/KAISER<br>BLIND CHANNEL, 1 MILE SE OF HUNGRY HARBOR<br>TOW LENGTH 1.5 MILES | A-89-5 | BOTTOM<br>NO OIL, NO SAMPLE | BOTTOM TRAWL |
| 29 MAR 0844 | 240 | NOAA/KAISER<br>START 100 YDS SW BRIDGE, NO. SIDE CHANNEL END*<br>1 PHOTO, 1 FISH SAMPLE | B-89-1 | BOTTOM<br>6" DIAMETER OIL STAIN ON NET<br>*BUOY 37 | 5 M BALLOON BOTTOM TRAWL |
| 29 MAR 0917 | 241 | NOAA/KAISER<br>1/4 MILE NE BUOY 39 TO N. SIDE MAIN CHANNEL OFF*<br>1 PHOTO, 3 SAMPLES | B-89-2 | BOTTOM<br>1 SMALL TARBALL, MINOR STAINS<br>*EAST END MOORING BASIN | BOTTOM TRAWL |
| 29 MAR 0930 | 242 | NOAA/KAISER<br>NO. SIDE CHANNEL OFF EAST END MOORING BASIN | B-89-3 | SURFACE WATER<br>1 EA. 50 CENT-SIZED TARBALL | VISUAL SURVEY |
| 29 MAR 0917 | 243 | NOAA/KAISER<br>1/4 MILE NE BUOY 34 TO NO. SIDE OF CHANNEL OFF E.*<br>FISH SAMPLE | B-89-4 | BOTTOM<br>BOTTOM TRAWL<br>*END OF MOORING BASIN | BOTTOM TRAWL |
| 29 MAR 0917 | 244 | NOAA/KAISER<br>1/4 MILE NE BUOY 39 TO N. SIDE OF MAIN CHANNEL* | B-89-5 | BOTTOM<br>1 TARBALL SAMPLE<br>*OFF EAST END OF MOORING BASIN | BOTTOM TRAWL |
| 29 MAR 0917 | 245 | NOAA/KAISER<br>1/4 MILE NE BUOY 39 TO N. SIDE CHANNEL OFF EAST*<br>*END OF MOORING BASIN | B-89-6 | BOTTOM<br>1 ABSORBENT PAD, SMALL OIL STAIN | BOTTOM TRAWL |
| 29 MAR 0950 | 246 | NOAA/KAISER<br>1/4 MILE OFF COAST GUARD MUSEUM | B-89-7 | SURFACE WATER<br>SIGHTED 4 CM TARBALL WITH SHEEN | VISUAL SURVEY |
| 29 MAR 0955 | 247 | NOAA/KAISER<br>FROM ASTORIA BRIDGE TO BUOY<br>2-5 CM | B-89-8 | SURFACE WATER<br>SAW 24 FLOATING TARBALLS WITH SILVER SHEEN SIZE OF BALLS | VISUAL SURVEY |
| 29 MAR 1242 | 248 | NOAA/KUMMERLOWE<br>SO. SIDE MAIN CHANNEL NEAR BUOY #54, W. TIP OF *<br>SLIGHT FLOOD | C-89-1 | BOTTOM<br>SAVED 1 SMELT AND 1 FLOUNDER, NO OIL<br>*RICE ISLAND | BOTTOM TRAWL, 5 M. |
| 29 MAR 1310 | 249 | NOAA/KUMMERLOWE<br>WEST TIP MILLER SANDS, SO. OF CHANNEL | C-89-2 | BOTTOM<br>NO OIL, 12 FISH, SAVED SMALL, SHRIMP-LIKE ANIMALS | BOTTOM TRAWL, 5 M. |
| 29 MAR 1431 | 250 | NOAA/KUMMERLOWE<br>NW TIP OF JIM CROW SANDS<br>2 PHOTOS | C-89-3 | BOTTOM<br>APPROX. 2 LITERS OF LEAVES WITH OIL GLOBS<br>1 KNOT EBB | BOTTOM TRAWL, 5 M. |
| 29 MAR 1430 | 251 | NOAA/KUMMERLOWE<br>ASTORIA BRIDGE TO JIM CROW SANDS, MAIN CHANNEL | C-89-4 | BEACH SURVEY<br>VERY SCATTERED TARBALLS LESS THAN 5/MILE | VISUAL SURVEY |
| 29 MAR 1122 | 252 | NOAA/KUMMERLOWE<br>OLD SEINE HOUSE AT TAYLOR SANDS<br>CAUGHT STICKS, NO FISH | C-89-5 | BOTTOM<br>NO OIING ON NET,<br>1/4 KNOT EBB | BOTTOM TRAWL, 5 M |

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| | | NOTES ..... | | | |
| 29 MAR 1205 | 253 | NOAA/KUMMERLOWE<br>SW TIP OF RICE ISLAND | C-89-6 | BOTTOM<br>NO OIL. SAND ONLY | BOTTOM TRAWL |
| | | SLIGHT FLOOD | | | |
| 29 MAR 1320 | 254 | NOAA/KUMMERLOWE<br>BUOY #2 | C-89-7 | BOTTOM<br>NO OIL, 2 FISH (1 FLOUNDER), 3 PEBBLES, LEAVES (SEE PHOTO OF | BOTTOM TRAWL |
| | | SORBENT PAD) -1 PHOTO- | | 1/2 KNOT EBB | |
| 29 MAR 1230 | 255 | EPA/SAINSBURY<br>WASHINGTON SIDE, DOWNSTREAM, FIG "41" | D-89-1* | BOTTOM<br>SLIGHT CONTAMINATION | CANNONBALL |
| | | *EPA SYSTEM NO. D-89-28 (D-89-1 THRU 27 NOT CHAIN OF CUSTODYSAMPLES) | | | |
| 29 MAR 1235 | 256 | EPA/SAINSBURY<br>UPSTREAM END COTTONWOOD, 45 FT. DEEP | D-89-2* | BOTTOM<br>SLIGHT CONTAMINATION | CANNONBALL |
| | | *EPA SYSTEM NO. D-89-29 (D-89-1 THRU 27 NOT CHAIN OF CUSTODYSAMPLES) | | | |
| 29 MAR 1235 | 257 | NOAA/KAISER<br>1 NM EAST OF TONGUE POINT | B-89-9 | SOOT SPILL, ABOUT 3/4 NM LONG | PHOTOGRAPH |
| | | THREE (3) PHOTOS TAKEN | | | |
| 30 MAR 0846 | 258 | NOAA/KUMMERLOWE<br>COE PIER THRU PRAIRIE CHANNEL (UPRIVER) | B-90-1 | SURFACE WATER<br>NO OIL OBSERVED | VISUAL SURVEY |
| 30 MAR 0942 | 259 | NOAA/KUMMERLOWE<br>DM 12A, SVENSEN ISLAND, PRAIRE CHANNEL | B-90-2 | BOTTOM<br>NO OIL, SAMPLE DISPOSED (24' DEPTH) | BOTTOM TRAWL |
| | | ABOUT 3 DOZ. SMALL FISH, ISOPODS, STICKS, CUPS | | | |
| 30 MAR 0942 | 260 | NOAA/KUMMERLOWE<br>DM 12A (UPRIVER) | B-90-3 | ABOUT 2 FT. ABOVE BOTTOM<br>100 1-MM-SIZED TARBALLS IN NET | PLANKTON TOW |
| 30 MAR 1010 | 261 | NOAA/KUMMERLOWE<br>DM 15, PRAIRIE CHANNEL (DOWNRIVER) | B-90-4 | ABOUT 2 FT. ABOVE BOTTOM<br>ABOUT 100 1-MM-SIZED TARBALLS IN NET | PLANKTON NET |
| | | 30 FT. DEPTH | | | |
| 30 MAR 1010 | 262 | NOAA/KUMMERLOWE<br>DM 15 (DOWNRIVER, PRAIRIE CHANNEL) | B-90-5 | BOTTOM<br>NO OIL | BOTTOM TRAWL |
| | | ABOUT 15 SMALL FISH (UNOILED) IN NET (SAMPLE DISPOSED) | | 30 FT. DEPTH | |
| 30 MAR 1050 | 263 | NOAA/KUMMERLOWE<br>NE TIP OF MARSH ISLAND, PRAIRIE CHANNEL | B-90-6 | BOTTOM<br>NO SAMPLE | BOTTOM TRAWL |
| | | TRAWL HUNG UP ON SNAG IN RIVER | | | |
| 30 MAR 1113 | 264 | NOAA/KUMMERLOWE<br>SO. SIDE OF MARSH ISLAND | B-90-7 | 10 FT. BELOW WATER SURFACE<br>NO OIL, ONLY DETRITUS IN NET | PLANKTON NET |
| 30 MAR 1148 | 265 | NOAA/KUMMERLOWE<br>SW FROM BUOY 19 TO SVENSEN ISLAND, ABOUT 1/2 MILE | B-90-8 | BOTTOM<br>NO OIL | BOTTOM TRAWL |
| | | ABOUT 12 SMALLFISH IN NET (SMELT, STICKLEBACK, ETC.) | | 30 FT. WATER DEPTH | |
| 30 MAR 1303 | 266 | NOAA/KUMMERLOWE<br>NO. FROM MINAKER ISLAND TO BIG CREEK SLOUGH | B-90-9 | BOTTOM<br>NO OIL | BOTTOM TRAWL |
| | | 4 SMALL STICKLEBACK FISH | | 24 FT. WATER DEPTH | *WEST TOWARDS DM 15 |
| 30 MAR 1330 | 267 | NOAA/KUMMERLOWE<br>DM 12A, PRAIRIE CHANNEL (DOWNRIVER) | B-90-10 | BOTTOM<br>NO OIL | BOTTOM TRAWL |
| | | ABOUT 4 DOZ. SMALL STICKLEBACK, SMELTS (UNOILED) | | 30 FT. WATER DEPTH | |
| 30 MAR 1328 | 268 | NOAA/KUMMERLOWE<br>DM 12A, PRAIRIE CHANNEL | B-90-11 | ABOUT 10 FT. ABOVE BOTTOM<br>100 1-MM-SIZED TARBALLS IN NET | PLANKTON NET |
| 30 MAR 0940 | 269 | NOAA/KAISER<br>WOODY ISLAND CHANNEL | A-90-1 | BOTTOM<br>SEVERAL BLOBS OF OIL ON NET--NONE ON SORBENT | BOTTOM TRAWL |
| | | SAMPLE DISPOSED | | | |
| 30 MAR 1000 | 270 | NOAA/KAISER<br>WOODY ISLAND CHANNEL, WOODY ISLAND ABEAM | A-90-2 | BOTTOM<br>BLOB OF OIL ON NET. SIGN OF OIL ON GROUND CHAIN | BOTTOM TRAWL |

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|---|---|---|---|---|---|
| 30 MAR 0930 | 271 | VESSEL VALISA/GILLNETTER<br>WOODY ISLAND AND HORSESHOE ISLAND<br>CONCERN THAT TEST GILL NET FISHING ON MONDAY WILL BE | A-90-3 | BOTTOM<br>SOME OIL ABOUT EVERY EIGHT FEET ON GEAR<br>AFFECTED. SOME OILING OF HIS GEAR | LONG LINE |
| 30 MAR 1000 | 272 | NOAA/KAISER<br>PRAIRIE CHANNEL NEAR "23" FL-4 SEC<br>1108 FL 4-SEC. 23 ABEAM 12' DEEP (40 YDS OFF) | A-90-4 | BOTTOM<br>11-12 SMALL FLATFISH (3-4", 1 SCULPIN, NO OIL<br>SOME DEBRIS IN NET | BOTTOM TRAWL |
| 30 MAR 1135 | 273 | NOAA/KAISER<br>CLIFTON/PRAIRIE CHANNEL - 1/4 MILE WEST ALDRICH PT<br>DEPTH 20 FT | A-90-5 | BOTTOM<br>1-12" SUCKER SEVERAL SMALLER FISH. NO OIL - SAMPLE DISPOSED<br>TORN NET | BOTTOM TRAWL |
| 30 MAR 1215 | 274 | NOAA/KAISER<br>CLIFTON CHANNEL | A-90-6 | BOTTOM<br>1 SUCKER - CLEAN, SEVERAwL SMALL FISH. NO OIL | BOTTOM TRAWL |
| 30 MAR 1250 | 275 | NOAA/KAISER<br>TENASILLAHE ISLAND LIVESTOCK DECK | A-90-7 | SHORELINE<br>100 SQ. FEET OF OILED DEBRIS AS PREVIOUSLY OBSERVED | VISUAL SURVEY |
| 30 MAR 1255 | 276 | NOAA/KAISER<br>MOUTH OF CLIFTON CHANNEL TO PUGET ISLAND | A-90-8 | BOTTOM<br>NO OIL - 3 OR 4 SMALL SCUPLIN AND SUCKERS - HEALTHY | BOTTOM TRAWL |
| 30 MAR 1325 | 277 | NOAA/KAISER<br>CATHLAMET CHANNEL | A-90-9 | BOTTOM<br>NO OIL - SMALL HEALTHY STURGEON. 1 PHOTO | BOTTOM TRAWL |
| 30 MAR 1400 | 278 | NOAA/KAISER<br>HUNTING ISLANDS 1/4 MILE SOUTH "39"<br>MAY HAVE BEEN A LIGHT SHEEN WHEN DEBRIS WAS THROWN | A-90-10 | BOTTOM<br>NO OIL. DEBRIS AND 4-5 SMALL FISH<br>BACK IN | BOTTOM TRAWL |
| 30 MAR 1435 | 279 | NOAA/KAISER<br>WHITETAIL DEER REFUGE - MID-CHANNEL | A-90-11 | BOTTOM<br>NO OIL - NET MAY NOT HAVE BEEN ON BOTTOM | BOTTOM TRAWL |
| 30 MAR 1100 | 280 | NOAA/BACA<br>WILLAPA BAY<br>15 PHOTOS TAKEN, MEASURED OIL | C-90-1 | BEACH SURVEY<br>FOUND BEACH OIL IN LIGHT QUANTITIES, OILED BIRDS | VISUAL SURVEY |
| 30 MAR 1530 | 281 | NOAA/BACA<br>LONG BEACH<br>ROADS. 10 PHOTOS TAKEN | C-90-2 | BEACH SURVEY<br>LIGHT OILING, AVERAGE OF 2 OILED BIRDS/MILE, OILED BIRDS ON | VISUAL SURVEY |
| 30 MAR 1600 | 282 | NOAA/BACA<br>OCEAN PARK<br>MILE. 10 PHOTOS TAKEN | C-90-3 | BEACH SURVEY<br>LIGHT OILING, PANCAKES UP TO 60CM. AVERAGE 2 OILED BIRDS/ | VISUAL SURVEY |
| 30 MAR | 283 | NOAA/BACA<br>NO. END ASTORIA BRIDGE<br>4 PHOTOS TAKEN | C-90-4 | BEACH SURVEY<br>VERY LIGHT OIL FOUND | VISUAL SURVEY |
| 21 MAR | 284 | NOAA/KUMMERLOWE<br>BUOY #7 | A-81-1 | BOTTOM | GRAB |
| 21 MAR | 285 | NOAA/KUMMERLOWE<br>BUOY #7 | A-81-2 | WATER COLUMN | PLANKTON NET - TOW |
| 21 MAR | 286 | NOAA/KUMMERLOWE<br>MID SHIP OF MOBILOIL STBD SIDE DWNRIVER 100 FT<br>VISUAL OBS- LIGHT SHEEN ON WATER SURFACE | A-81-3 | BOTTOM | SEDIMENT GRAB |
| 31 MAR 1130 | 287 | NOAA/KAISER<br>INSIDE CLATSOP SPIT | A-91-1 | BEACH SURVEY<br>1 EA. 5" TARBALL EVERY 50-100 FT. | VISUAL SURVEY |
| 31 MAR 1300 | 288 | NOAA/KAISER<br>SEASIDE BEACH<br>SPECK AND 50-CENT-SIZED SHEEN, TARBALL SAMPLE TAKEN | A-91-2 | BEACH SURVEY<br>1 DIFFICULT-TO-FIND TARBALL EVERY 50 YDS. OCCASIONAL OIL | VISUAL & SCOOP (JAR) |

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| 31 MAR 1330 | 289 | NOAA/KAISER<br>FIVE MILES NORTH OF SEASIDE | A-91-3 | BEACH SURVEY<br>NO OIL | VISUAL SURVEY |
| 31 MAR 1205 | 290 | NOAA/KUMMERLOWE<br>FIRST BEACH NO. OF CAPE DISAPPOINTMENT LIGHT | B-91-1 | OIL FROM KAYAK<br>FOUND TAR, OIL | STICK, PLASTIC BAG |
| 31 MAR 1210 | 291 | NOAA/KUMMERLOWE<br>FIRST BEACH NO. OF CAPE DISAPPOINTMENT LIGHT | B-91-2 | TARRY STICK | STICK, JAR |
| 31 MAR 1300 | 292 | NOAA/KUMMERLOWE<br>BEACH, 100 YDS. NO. OF NORTH JETTY | B-91-3 | BEACH TARBALL | STICK |
| 31 MAR 1140 | 293 | VESSEL CAROLINE/CREW<br>OFFSHORE NORTH HEAD, 2-3 MILES | B-91-4 | BOTTOM<br>NO OIL | BOTTOM TRAWL - VISUAL |
| 31 MAR 1150 | 294 | NOAA/KUMMERLOWE<br>BEACH WEST OF JETTY (OCEAN SIDE) | B-91-5 | BEACH - FLOTSAM<br>NO OIL SPOTTED | VISUAL SURVEY |
| 31 MAR 1210 | 295 | NOAA/KUMMERLOWE<br>FT. CANBY BEACH, NO. OF CAPE DISAPPOINTMENT LIGHT<br>PHOTOS TAKEN | B-91-6 | BEACH SURVEY<br>VERY LIGHTLY SCATTERED SMALL TARBALLS | VISUAL SURVEY |
| 31 MAR 1300 | 296 | NOAA/KUMMERLOWE<br>BEACH NORTH OF NORTH JETTY | B-91-7 | BEACH SURVEY<br>VERY LIGHTLY SCATTERED, SMALL TARBALLS | VISUAL SURVEY |
| 31 MAR 1320 | 297 | NOAA/KUMMERLOWE<br>NORTH HEAD | B-91-8 | BEACH SURVEY<br>SEA FOAM WAS BROWN--DIATOMACEOUS | VISUAL SURVEY |
| 31 MAR 1340 | 298 | NOAA/KUMMERLOWE<br>ILWACO FISH DOCKS | B-91-9 | DOCKMASTERS, SKIPPERS, CREW<br>NO SIGNIFICANT OIL OBSERVED ON ANYONE'S GEAR | VERBAL (CONVERSATIONS) |
| 31 MAR 1400 | 299 | NOAA/KUMMERLOWE<br>CHINOOK CANNERY | B-91-10 | DOCKMASTER, TERRY KRAGER<br>NOSIGNIFICANT OIL OBSERVED ON ANYONE'S GEAR | VERBAL (CONVERSATION) |
| 31 MAR 0600 | 300 | NOAA/PAYTON<br>BAKER BAY (NORTH END, WEST SIDE)<br>ILWACO HARBOR DRYDOCK-HAVEN'T NOTICED ANY SIGNIFICANT OIL. LIGHT WIND. 3 OILED BIRDS (ALIVE), SPECIES | C-91-1 | BEACH SURVEY<br>NO VISIBLE OIL, NO TARBALLS.LOW TIDE. TALKED TO FISHERMAN AT | 15-MIN. WALKING, REST FROM CAR |
| 31 MAR 0630 | 301 | NOAA/PAYTON<br>ILWACO TO OCEAN PARK<br>LIKE ANIMALS, NEAR OCEAN PARK. LOW TIDE, LIGHT NW WIND | C-91-2 | BEACH SURVEY<br>LITTLE TO NO OIL SOME SMALL OIL INCORPORATED INTO JELLYFISH-<br>1 DEAD BIRD - WESTERN GREBE | ACCESS ROADS, WALK EACH WAY. |
| 31 MAR 0820 | 302 | NOAA/PAYTON<br>WILLAPA BAY, 11 ACCESS PLACES<br>LOW TIDE. NO WIND | C-91-3 | BEACH SURVEY<br>BEACH ON 5 OF THEM,JUST LOOKED AT OTHERS. NO OIL FOUND. VERY<br>2 OILED (ALIVE) BIRDS | 11 ACCESS PLACES. WALKED ON |
| 31 MAR 1100 | 303 | NOAA/PAYTON<br>NORTH COVE TO WESTPORT<br>SOUTHERNMOST. GRAYLAND STATE PARK BEACH ACCESS, LIGHT COVER-AGE FOR ABOUT 1/2 MILE (LESS THAN 3 TARBALLS/ | C-91-4 | BEACH SURVEY<br>AT (5 WALKED). NO OIL UNTIL ABOUT 1/4 MILE SOUTH OF THE | 8 ACCESS ROADS, 3 ONLY LOOKED |
| 31 MAR 1230 | 304 | NOAA/PAYTON<br>LONG BEACH TO OYSTERVILLE (SEAVIEW ESTATES) | C-91-5 | BEACH SURVEY<br>STILLNEAR OCEAN PARK. NONE FOUND UP NORTH | 5 ACCESS ROADS. SMALL AMOUNT |
| 31 MAR 1150 | 305 | NOAA/PAYTON<br>SWASH LINE NEAR S. GRAYLAND STATE PARK BEACH ACCES | C-91-6 | BIRD - WESTERN GREBE<br>1 DEAD, OILED BIRD (2 SAMPLES: BIRD, FEATHERS) | BY HAND |
| 1 APR 0800 | 306 | NOAA/KUMMERLOWE<br>HAMMOND MARINA | A-92-1 | BEACH SURVEY<br>NO SHEEN - ONE DEAD GREBE (OILED) | VISUAL/WALK |

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|---|---|---|---|---|---|
| | | NOTES ..... | | | |
| 1 APR 0905 | 307 | NOAA/KUMMERLOWE<br>300 YDS S. OF ENTRANCE TO ILWACO CHANNEL, HDG ESE<br>WATER DEPTH, 30 FEET 4-5 DOZEN FISH | A-92-2 | BOTTOM<br>NO OIL<br>END SURVEY 0920 | BOTTOM TRAWL |
| 1 APR 0933 | 308 | NOAA/KUMMERLOWE<br>2000 YDS S. OF SAND ISLAND, END D.M. 11<br>72 FEET WATER DEPTH | A-92-3 | BOTTOM<br>NO OIL<br>KELP & LEAVES, ABOUT 1 DOZEN FISH | BOTTOM TRAWL |
| 1 APR 1000 | 309 | NOAA/KUMMERLOWE<br>BUOY 14, 400 YDS OFFSHORE -END BUOY 19<br>DEPTH 48 FEET, 1 DOZEN FISH | A-92-4 | BOTTOM<br>NO OIL<br>END SURVEY AT 1015 | BOTTOM TRAWL |
| 1 APR 1020 | 310 | NOAA/KUMMERLOWE<br>1/2 MILE E. OF CLATSOP SPIT (BUOY 19), 100 YDS OS<br>WATER DEPTH 30 FEET, ONE CRAB | A-92-5 | BOTTOM<br>NO OIL<br>END SURVEY 1035 | BOTTOM TRAWL |
| 1 APR 1230 | 311 | NOAA/KUMMERLOWE<br>FORT CANBY STATE PARK<br>BEACH SURVEY | A-92-6 | BEACH SURVEY<br>VERY LIGHT SCATTERING OF TAR BALLS, NO CHANGE FROM 3/31/1984 | VISUAL SURVEY |
| 1 APR 1300 | 312 | NOAA/KUMMERLOWE<br>CAPE DISAPPOINTMENT LIGHTHOUSE | A-92-7 | BAR<br>NO OIL OBSERVED | VISUAL SURVEY |
| 1 APR 1320 | 313 | NOAA/KUMMERLOWE<br>ILWACO | A-92-8 | ACCOUNTS, FISHERMEN<br>HAD NOT SEEN ANY OIL | TALKING WITH FISHERMEN |
| 1 APR 1200 | 314 | NOAA/KAISER<br>COLUMBIA RIVER MOUTH<br>TRANSITIONAL PERIOD, CURRENTS WEAK TO NORTH) | B-92-1 | SURVEY OF SEDIMENT PLUME<br>DEFINITE NORTH FLOW, BUT SOME SOUTH SCATTER (IMPLIES | AERIAL SURVEY |
| 1 APR 1100 | 315 | NOAA/KAISER<br>CAPE DISAPPOINTMENT (TO) LEDBETTER POINT<br>ON BEACH NEAR LONG BEACH & LEDBETTER POINT. PHOTOS TAKEN, BOTH 35MM AND POLAROID. | B-92-2 | BEACH SURVEY<br>DIATEMACEOUS, LOOKED LIKE POSSIBLE OIL SURF. VELELHA OR OIL | AERIAL SURVEY |
| 1 APR 1122 | 316 | NOAA/KAISER<br>BAY CENTER, WILLAPA BAY TO NORTH COVE | B-92-3 | BEACH SURVEY<br>NO OBVIOUS OILING | AERIAL SURVEY, ALTITUDE 500' |
| 1 APR 1126 | 317 | NOAA/KAISER<br>NORTH COVE (TO) WESTPORT | B-92-4 | BEACH SURVEY<br>POSSIBLE OIL NEAR GRAYLAND (ABOUT 1/4 MILE, EACH SIDE)<br>PHOTOS TAKEN, 35MM | AERIAL SURVEY, 500' |
| 1 APR 1132 | 318 | NOAA/KAISER<br>POINT BROWE (TO) OCEAN SHORES | B-92-5 | BEACH SURVEY<br>POSSIBLE OIL NEAR OCEAN SHORES<br>PHOTOS TAKEN, 35MM | AERIAL SURVEY, 500' |
| 1 APR 1505 | 319 | NOAA/BACA<br>0.5 MILE SOUTH OF CHINOOK<br>NO SAMPLES | B-92-6 | MARSH GRASS | PHOTOGRAPH (35 MM) |
| 1 APR 1530 | 320 | NOAA/BACA<br>SEAVIEW TO OYSTERVILLE, (PACIFIC SIDE)<br>UP BEING CONDUCTED. PICTURES OF OIL IN BAG. 5 BAGS CHECKED, 1-W/BIRD. SUSPECTED OIL ON MORNING OVERFLITE | B-92-7 | BEACH SURVEY<br>FEW SCATTERED TARBALLS, 3 OILED & DEAD WESTERN GREBES. CLEAN | VISUAL, PHOTOGRAPHS |
| 29 MAR 0815 | 321 | EPA/SAINSBURY<br>BETWEEN GOBLE & SANDY ISL. ; ORE. SIDE | D-89-1 | BOTTOM<br>NO OIL | CANNONBALL/DIAPER |
| 29 MAR 0825 | 322 | EPA/SAINSBURY<br>BETWEEN GOBLE & SANDY ISL. ;85 FT. DEEP | D-89-2 | BOTTOM<br>OIL FLECKS | CANNONBALL |
| 29 MAR 0835 | 323 | EPA/SAINSBURY<br>BETWEEN GOBLE & SANDY ISL. ; 65 FT. DEEP<br>TAIL END OF DEEP | D-89-3 | BOTTOM<br>OIL FLECKS | CANNONBALL |
| 29 MAR 0845 | 324 | EPA/SAINSBURY<br>BETWEEN GOBLE & SANDY ISL. ; 95 FT. DEEP | D-89-4 | BOTTOM<br>OIL FLECKS | CANNONBALL |

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|---|---|---|---|---|---|
| 29 MAR 0900 | 325 | EPA/SAINSBURY ORE. SIDE (FL. R. "52" ) | D-89-5 | BOTTOM OIL FLECKS | CANNONBALL |
| 29 MAR 0920 | 326 | EPA/SAINSBURY UPSTREAM END MARTIN ISL. (G "67" ) | D-89-6 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 0930 | 327 | EPA/SAINSBURY COL. R, MID-CHANNEL, MARTIN ISL. ; 34 FT. DEEP | D-89-7 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 0940 | 328 | EPA/SAINSBURY FL. G. "65", MARTIN ISL. ; 55 FT. DEEP | D-89-8 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 0945 | 329 | EPA/SAINSBURY MARTIN BLUFF | D-89-9 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 0950 | 330 | EPA/SAINSBURY MARTIN BLUFF, MID-CHANNEL ; 50 FT. DEEP | D-89-10 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 0955 | 331 | EPA/SAINSBURY MARTIN BLUFF, DOWNSTREAM ; 65 FT. DEEP | D-89-11 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 1000 | 332 | EPA/SAINSBURY MARTIN BLUFF, DOWNSTREAM | D-89-12 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 1005 | 333 | EPA/SAINSBURY MARTIN BLUFF, DOWNSTREAM | D-89-13 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 1010 | 334 | EPA/SAINSBURY WASH. SIDE OPPOSITE DEER ISL. PT., LT. "59" ;80 FT | D-89-14 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 1014 | 335 | EPA/SAINSBURY LT. "59" MID-CHANNEL | D-89-15 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 1018 | 336 | EPA/SAINSBURY KALAMA GRAIN SILOS, UPSTREAM END | D-89-16 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 1024 | 337 | EPA/SAINSBURY KALAMA GRAIN SILOS, DOWNSTREAM END | D-89-17 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 1028 | 338 | EPA/SAINSBURY MID-CHANNEL OFF KALAMA GRAIN SILOS | D-89-18 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 1032 | 339 | EPA/SAINSBURY KALAMA, MID-CHANNEL FL. G "49" 30 FT. DRAG ON BOTTOM | D-89-19 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 1050 | 340 | EPA/SAINSBURY KALAMA , FL. G "47A" 50 FT. DRAG | D-89-20 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 1055 | 341 | EPA/SAINSBURY KALAMA, DOWNSTREAM 50 FT. DRAG | D-89-21 | BOTTOM NO OIL | CANNONBALL |
| 29 MAR 1100 | 342 | EPA/SAINSBURY KALAMA, DOWNSTREAM 50 FT. DRAG | D-89-22 | BOTTOM NO OIL | CANNONBALL |

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| | | NOTES ..... | | | |
| 29 MAR 1115 | 343 | EPA/SAINSBURY<br>ORE. SIDE, UPSTREAM FROM TROJAN ; 100 FT. DEEP<br>50 FT. DRAG | D-89-23 | BOTTOM<br>NO OIL | CANNONBALL |
| 29 MAR 1120 | 344 | EPA/SAINSBURY<br>ORE. SIDE UPST. TROJAN/COFFIN ROCK<br>DRUG BALL APP. 120 FT. DEEP ALONG BOTTOM | D-89-24 | BOTTOM<br>MINOR OIL FLECKS | CANNONBALL |
| 29 MAR 1130 | 345 | EPA/SAINSBURY<br>ORE. SIDE UPST. TROJAN/COFFIN ROCK ; 70 FT. DEEP<br>DRUG BALL ALONG BOTTOM | D-89-25 | BOTTOM<br>OIL FLECKS | CANNONBALL |
| 29 MAR 1140 | 346 | EPA/SAINSBURY<br>ORE. SIDE DWNST. TROJAN/COFFIN ROCK ; 70 FT. DEEP<br>BALL DRAGGER 30-40 FT. | D-89-26 | BOTTOM<br>NO OIL FLECKS | CANNONBALL |
| 29 MAR 1208 | 347 | EPA/SAINSBURY<br>MID-CHANNEL DWNST. TROJAN | D-89-27 | BOTTOM<br>LIGHT OIL FLECKS | CANNONBALL |
| 29 MAR 1230 | 348 | EPA/SAINSBURY<br>FL. G "41" WASH. SIDE<br>BOTTOM DRAG OF APP. 100 FT. | D-89-28 | BOTTOM<br>LIGHT OILING | CANNONBALL |
| 29 MAR 1240 | 349 | EPA/SAINSBURY·<br>UPST. END COTTONWOOD ISL. ; 45 FT. DEEP<br>DRAG OF APP. 100 FT. | D-89-29 | BOTTOM<br>FLECKS | CANNONBALL |
| 29 MAR 1245 | 350 | EPA/SAINSBURY<br>MID-CHANNEL FL. G "39" ; 50 FT. DEEP<br>DRAG OF APP. 100 FT. | D-89-30 | BOTTOM<br>NO FLECKS | CANNONBALL |
| 29 MAR 1250 | 351 | EPA/SAINSBURY<br>WASH. SIDE FL. G "39" ; 40 FT. DEEP<br>DRAG OF APP. 100 FT. | D-89-31 | BOTTOM<br>NO OIL | CANNONBALL |
| 29 MAR 1255 | 352 | EPA/SAINSBURY<br>WASH. SIDE FL. "33" ; 60 FT. DEEP<br>DRAG OF APP. 100 FT. | D-89-32 | BOTTOM<br>NO OIL | CANNONBALL |
| 29 MAR 1320 | 353 | EPA/SAINSBURY<br>WASH. SIDE DWNST. FL.G "29A"<br>DRAG OF APP. 100 FT. | D-89-33 | BOTTOM<br>FLECKS | CANNONBALL |
| 29 MAR 1345 | 354 | EPA/SAINSBURY<br>OK FL. "17" DWNST. MT. COFFIN ; 100 FT. DEEP<br>100 FT. DEEP , DRAG OF APP. 100 FT. | D-89-34 | BOTTOM<br>NO OIL | CANNONBALL |
| 29 MAR 1400 | 355 | EPA/SAINSBURY<br>DWNST. WALKER ISL. , ORE. SIDE ; 35 FT. DEEP | D-89-35 | BOTTOM<br>FLECKS | CANNONBALL |
| 29 MAR 1405 | 356 | EPA/SAINSBURY<br>DWNST. WALKER ISL., ORE. SIDE ; 40 FT. DEEP<br>DRAG OF APP. 100 FT. | D-89-36 | BOTTOM<br>FLECKS | CANNONBALL |
| 29 MAR 1410 | 357 | EPA/SAINSBURY<br>DWNST. WALKER ISL. , ORE. SIDE ; 65 FT. DEEP<br>DRAG OF APP. 100 FT. | D-89-37 | BOTTOM<br>NO FLECKS | CANNONBALL |
| 29 MAR 1425 | 358 | EPA/SAINSBURY<br>UPSTRM. GREEN PT. ORE. ; 30 FT. DEEP<br>NO'S 038-042 ARE A SEQUENTIAL TRAVERSE ACROSS THE RIVER; ORE. TO WASH. SIDES. | D-89-38 | BOTTOM<br>FLECKS | CANNONBALL |
| 29 MAR 1430 | 359 | EPA/SAINSBURY<br>UPSTRM. GREEN PT. ORE. ; 35 FT. DEEP<br>NO'S 038-042 ARE A SEQUENTIAL TRAVERSE ACROSS THE RIVER; ORE. TO WASH. SIDES. | D-89-39 | BOTTOM<br>FLECKS | CANNONBALL |
| 29 MAR 1435 | 360 | EPA/SAINSBURY<br>UPSTRM. GREEN PT. ORE., MID-CHANNEL ; 55 FT. DEEP<br>NO'S 038-042 ARE A SEQUENTIAL TRAVERSE ACROSS THE RIVER; ORE. TO WASH. SIDES. | D-89-40 | BOTTOM<br>NO OIL | CANNONBALL |

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| | | NOTES ..... | | | |
| 29 MAR 1440 | 361 | EPA/SAINSBURY<br>UPSTRM. GREEN PT. ORE. ; 25 FT. DEEP | D-89-41 | BOTTOM<br>FLECKS | CANNONBALL |
| | | NO'S 038-042 ARE A SEQUENTIAL TRAVERSE ACROSS THE RIVER; ORE. TO WASH. SIDES. | | | |
| 29 MAR 1445 | 362 | EPA/SAINSBURY<br>UPSTRM. GREEN PT. ORE. ; 17 FT. DEEP | D-89-42 | BOTTOM<br>NO OIL | CANNONBALL |
| | | NO'S 038-042 ARE A SEQUENTIAL TRAVERSE ACROSS THE RIVER; ORE. TO WASH. SIDES. | | | |
| 29 MAR 1450 | 363 | EPA/SAINSBURY<br>UPSTRM. GREEN PT., HUMP ISL. ; 20 FT. DEEP | D-89-43 | BOTTOM<br>NO OIL | CANNONBALL |
| 29 MAR 1500 | 364 | EPA/SAINSBURY<br>STELLA, WASH. ; 55 FT. DEEP | D-89-44 | BOTTOM<br>NO OIL | CANNONBALL |
| 29 MAR 1505 | 365 | EPA/SAINSBURY<br>STELLA, WASH. ; 85 FT. DEEP | D-89-45 | BOTTOM<br>NO OIL | CANNONBALL |
| 29 MAR 1515 | 366 | EPA/SAINSBURY<br>CRIMS ISL. BEHIND GRAVEL BAR | D-89-46 | BOTTOM<br>OIL FLECKS | CANNONBALL |
| 29 MAR 1520 | 367 | EPA/SAINSBURY<br>DWNST. FROM STELLA ; 105 FT. DEEP | D-89-47 | BOTTOM<br>OIL FLECKS | CANNONBALL |
| 21 MAR | 368 | NOAA/KUMMERLOWE<br>MID-SHIP OF MOBILOIL STBD SIDE DWNRIVER 100 FT | A-81-4 | BOTTOM | SEDIMENT GRAB |
| 21 MAR | 369 | NOAA/KUMMERLOWE<br>MID-SHIP OF MOBILOIL STBD SIDE DWNRIVER 100 FT | A-81-5 | BOTTOM | SEDIMENT GRAB |
| 21 MAR | 370 | NOAA/KUMMERLOWE<br>ABEAM WARRIOR ROCK LIGHT 200 YDS EAST OF OTSD BOOM<br>60 FT WATER DEPTH | A-81-6 | BOTTOM | SEDIMENT GRAB |
| 21 MAR | 371 | NOAA/KUMMERLOWE<br>150 YDS DWNRIVER BUOY #4 TRANSECT 1, STATION A | A-81-7 | BOTTOM | SEDIMENT GRAB |
| | | TRANSECT 1 IS A LINE BETWEEN BUOY #4 AND DAY MARKER #6 | | | |
| 21 MAR | 372 | NOAA<br>STERN OF MOBILOIL - TRANSECT 1 STATION B | A-81-7.1 | WATER<br>NONE | |
| | | UNABLE TO GET SAMPLE, CURRENTS TOO STRONG | | | |
| 21 MAR | 373 | NOAA/KUMMERLOWE<br>SE OF WARRIOR ROCK LIGHT - TRANSECT 1 STATION C | A-81-8 | BOTTOM | SEDIMENT GRAB |
| 21 MAR | 374 | NOAA/KUMMERLOWE<br>100 YDS EAST OF WARRIOR ROCK LIGHT | A-81-9 | BOTTOM | SEDIMENT GRAB |
| 21 MAR | 375 | NOAA/KUMMERLOWE<br>25 YDS NE OF WARRIOR ROCK LIGHT | A-81-10 | BOTTOM | SEDIMENT GRAB |
| 22 MAR 1339 | 376 | NOAA/KUMMERLOWE<br>LINE BETWEEN WARRIOR ROCK AND DAYMARK 80 | A-82-1 | BOTTOM<br>TARBALLS 2CM SIZE | CANNONBALL |
| 22 MAR 1346 | 377 | NOAA/KUMMERLOWE<br>WARRIOR ROCK BETWEEN DAYMARK 80 AND 79 | A-82-2 | BOTTOM<br>HEAVY OIING - DIAPER COVERED WITH OIL | CANNONBALL |
| 22 MAR 1402 | 378 | NOAA/KUMMERLOWE<br>RT SIDE WARRIOR LT - TRANS. W/BCH 150 YDS N PR. LN | A-82-3 | BOTTOM<br>VERY HEAVY OIL | CANNONBALL |

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| 22 MAR 1413 | 379 | NOAA/KUMMERLOWE LINE BTWN WARRIOR RK & STACK, 25 YDS FROM LIGHT | A-82-4 | BOTTOM HEAVY OIL | CANNONBALL |
| 22 MAR 1330 | 380 | NOAA/KUMMERLOWE BETWEEN DAYMARK 4A AND BUOY 4 | A-82-5 | BOTTOM NO OIL | CANNONBALL |
| 22 MAR 1334 | 381 | NOAA/KUMMERLOWE BUOY 4 MIDWAY BETWEEN DAYMARK 6 AND 8 | A-82-6 | BOTTOM NO OIL | CANNONBALL |
| 22 MAR 1335 | 382 | NOAA/KUMMERLOWE LINE BETWEEN DAYMARK 8 AND BUOY 4 | A-82-7 | BOTTOM NO OIL | CANNONBALL |
| 22 MAR 1337 | 383 | NOAA/KUMMERLOWE LINE BETWEEN WARRIOR ROCK AND DAYMARK 5 | A-82-8 | BOTTOM NO OIL | CANNONBALL |
| 22 MAR 1350 | 384 | NOAA/KUMMERLOWE WARRIOR ROCK AND DAYMARK 79 | A-82-9 | BOTTOM VERY SMALL AMT OF OIL | CANNONBALL |
| 22 MAR 1353 | 385 | NOAA/KUMMERLOWE LINE BTW WARRIOR RK & WOODEN STRUC. (FRWD RGE MARK | A-82-10 | BOTTOM NO OIL | CANNONBALL |
| 22 MAR 1355 | 386 | NOAA/KUMMERLOWE 100 YDS OFFSHORE OF WARRIOR ROCK | A-82-11 | BOTTOM NO OIL | CANNONBALL |
| 22 MAR 1409 | 387 | NOAA/KUMMERLOWE LINE BTW WARRIOR RK & STACK, BUOY 4 & DAYMARK 8 | A-82-12 | BOTTOM NO OIL | CANNONBALL |
| 22 MAR 1410 | 388 | NOAA/KUMMERLOWE LINE BTW WARRIOR RK AND STACK 75 YDS FROM LIGHT | A-82-13 | BOTTOM 1 SMALL TAR BALL | CANNONBALL |
| 22 MAR 1412 | 389 | NOAA/KUMMERLOWE LINE BTW WARRIOR RK AND STACK, 50 YDS FROM LIGHT | A-82-14 | BOTTOM NO OIL | CANNONBALL |
| 22 MAR 1419 | 390 | NOAA/KUMMERLOWE 150 YDS N. OF WARRIOR ROCK LIGHT-165 MAGNETIC | A-82-15 | BOTTOM NO OIL | CANNONBALL |
| 22 MAR 1420 | 391 | NOAA/KUMMERLOWE WARIOR ROCK- 155 MAGNETIC- 150 YDS NORTH | A-82-16 | BOTTOM NO OIL | CANNONBALL |
| 22 MAR 1422 | 392 | NOAA/KUMMERLOWE WARRIOR ROCK 175 MAGNETIC | 1-82-17 | BOTTOM NO OIL | CANNONBALL |
| 22 MAR 1424 | 393 | NOAA/KUMMERLOWE WARRIOR ROCK - 188 MAGNETIC | A-82-18 | BOTTOM NO OIL | CANNONBALL |
| 22 MAR | 394 | NOAA/KUMMERLOWE BUOY 4 - DAYMARK 6 | A-82-19 | BOTTOM SLIGHT OIL | CANNONBALL |
| 22 MAR | 395 | NOAA/KUMMERLOWE 75 YDS OFF BEACH-150 - 200 YDS N. WARRIOR RK LIGHT | A-82-20 | BOTTOM NO OIL | CANNONBALL |
| 22 MAR 1522 | 396 | NOAA/KUMMERLOWE DAYMARK 73 TO DAYMARK 72- TRANSECT | A-82-21 | BOTTOM SLIGHT OIL | PLANKTON NET TOW |

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| 23 MAR 1655 | 397 | NOAA/KUMMERLOWE<br>CATHLAMET CHANNEL 100FT OFF DAYMARK 2<br>40' WATER DEPTH | A-83-1 | BOTTOM<br>NO OIL | CANNONBALL |
| 23 MAR 1707 | 398 | NOAA/KUMMERLOWE<br>DUE W TENASILLAHE ISL, N-MOST OF 20+ LOGRAFT DOLPH | A-83-2 | BOTTOM<br>NO OIL | CANNONBALL |
| 23 MAR 1712 | 399 | NOAA/KUMMERLOWE<br>SOUTH WEST ENTRANCE TO MULTNOMAH SLOUGH | A-83-3 | BOTTOM<br>NO OIL | CANNONBALL |
| 23 MAR 1716 | 400 | NOAA/KUMMERLOWE<br>NORTHWEST CORNER OF WELSH ISLAND | A-83-4 | BOTTOM<br>NO OIL | CANNONBALL |
| 23 MAR 1727 | 401 | NOAA/KUMMERLOWE<br>MIDDLE PILLAR ROCK UPPER RANGE BTW 2 RANGEMARKER | A-83-5 | BOTTOM<br>NO OIL | CANNONBALL |
| 1 APR 1505 | 402 | NOAA/BACA<br>BAKER BAY APP 1/2 MI UPRIVER OF CHINOOK<br>35MM PHOTO TAKEN | B-92-8 | MARSH GRASS<br>OILED, IN HOUSE SAMPLE TAKEN | PULLED GRASS |
| 22 MAR 1600 | 403 | WDF/NEWMAN<br>TWIN HARBORS, Y-GAP TO NORTH COVE | | BEACH SURVEY<br>NO EVIDENCE OF OIL | VISUAL INSPECTION |
| 23 MAR 1030 | 404 | WDF/MCINTOSH<br>TWIN HARBORS, WESTPORT TO NORTH COVE | | BEACH SURVEY<br>NO OIL OR OILED BIRDS | VISUAL SURVEY |
| 22 MAR 1400 | 405 | WDF/MOORE<br>LONG BEACH, OCEAN PARK TO TIP<br>LIGHTER TO NORTH | | BEACH SURVEY<br>+ 1 TAR BALL EVERY 3' TARBALL SAMPLES TAKEN | VISUAL SURVEY |
| 22 MAR 1600 | 406 | WDF/CREEKMAN<br>WAIKIKI BEACH AT N. JETTY | | BEACH SURVEY<br>LARGE (1.5 =DIA ) BLOBS EVERY 5 PACES SAMPLE TAKEN | VISUAL SURVEY |
| 22 MAR 1400 | 407 | WDF/CREEKMAN<br>LONG BEACH, SEAVIEW TO LONG BEACH | | BEACH SURVEY<br>LARGE GLOBS EVERY 10 PACES JAR SAMPLE TAKENN | VISUAL SURVEY |
| 22 MAR 1000 | 408 | WDF/MOORE<br>LONG BEACH, BEARDS HOLLOW TO LONG BEACH<br>TWO OILED BIRDS AT CRANBERRY | | BEACH SURVEY<br><1 3CM TARBALL PER SQ. FT. | VISUAL SURVEY |
| 23 MAR 1100 | 409 | WDF/MOORE<br>LONG BEACH<br>LIGHTER AT LEDBETTER - 8 OILED BIRDS, ONE DEAD | | BEACH SURVEY<br>HEAVY OILING, 10 CM BLOBS EVERY 2-3 FT AT SOUTH END | VISUAL SURVEY |
| 23 MAR 1800 | 410 | WDF/RAMMER<br>TWIN HARBORS BEACH | | BEACH SURVEY<br>OIL PRESENT FROM Y-GAP TO .7 MI NORTH | VISUAL SURVEY |
| 23 MAR 1600 | 411 | WDF/MOORE<br>LONG BEACH<br>2 GLOBS 1 FT., 2.5CM-10CM GLOBS 9 OILED BIRDS | | BEACH SURVEY<br>INCREASE IN OIL HEAVY AROUND XB | VISUAL SURVEY |
| 24 MAR 1400 | 412 | WDF/MOORE<br>LONG BEACH, LONG BEACH TO OCEAN PARK | | BEACH SURVEY<br>OIL ON BEACH, 9 OILED BIRDS | VISUAL SURVEY |
| 24 MAR 0800 | 413 | WDF/HOOPER<br>TWIN HARBORS, GRAYLAND APPROACH TO S. JETTY<br>3 LIVE OILED BIRDS | | BEACH SURVEY<br>OIL ON TWIN HARBORS BEACH (LIGHT OILING) | 6 JAR SAMPLES OF BEACHED OIL |
| 24 MAR 1400 | 414 | WDF/HOOPER<br>TWIN HARBORS, GRAYLAND BEACH NORTHEND TO SOUTHEND | | BEACH SURVEY<br>1 SAMPLE AT (AREA H) 1 SQ. FT. GLOB EVERY 3-4' | VISUAL AND JAR SAMPLES |

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|---|---|---|---|---|---|
| 24 MAR 1400 | 415 | WDF/TUFFS<br>LONG BEACH, TOKELAND,OYSTER PT., GRASSY ISL. | | BEACH SURVEY<br>NO SIGNS OF OIL | VISUAL SURVEY |
| 24 MAR 0900 | 416 | WDF/BARRY<br>COPALIS BEACH TO MOCLIPS | | BEACH SURVEY<br>NO OIL | VISUAL SURVEY |
| 24 MAR 1400 | 417 | WDF/BARRY<br>COPALIS BEACH TO MOCLIPS | | BEACH SURVEY<br>NO OIL | VISUAL SURVEY |
| 24 MAR 0900 | 418 | WDF/MOORE<br>LONG BEACH | | BEACH SURVEY<br>SAME AMT OF FRESH OIL AS ON 23RD (UP 2 GLOBS/FT 2.5 - 10CM) | VISUAL SURVEY |
| 25 MAR 0900 | 419 | WDF/MOORE<br>LONG BEACH, LONG BEACH TO OCEAN PARK | | BEACH SURVEY<br>HEAVIER FROM KLIPSAN TO OCEAN PARK, SAME LB TO KLIPSAN | VISUAL SURVEY |
| 25 MAR 0800 | 420 | WDF/H.HOOPER;D.HOOPER<br>TWIN HARBORS BEACH<br>EVERY 100 FT.) MODERATE AT XH AT 1800 IN LOCAL | | BEACH SURVEY<br>NO OIL EXCEPT VERY LIGHT OILING AT EDGEWATER (1 3CM GLOB | VISUAL SURVEY |
| 25 MAR 1400 | 421 | WDF/MOORE<br>LONG BEACH, OCEAN PARK TO TIP | | BEACH SURVEY<br>NO OIL AT TIP BUT LARGER GLOBS W. OF TIP/ O.P. NORTH SAME | VISUAL SURVEY |
| 26 MAR 1000 | 422 | WDF/MOORE<br>LONG BEACH, LONG BEACH TO TIP | | BEACH SURVEY<br>NEW OIL IN ALL AREAS, SAMPLES TAKEN | VISUAL & JAR |
| 26 MAR 1415 | 423 | WDF/NEWMAN<br>TWIN HARBORS, Y-GAP TO NORTH COVE<br>1/4 MI NORTH OF N.COVE 300' TRENCH 2-3" DEEP BUT NO OIL FOUND | | BEACH SURVEY<br>NO OIL FOUND | VISUAL SURVEY |
| 26 MAR 1500 | 424 | WDF/BARRY<br>COPALIS BEACH & MOCLIPS BEACH<br>MAX= 3 BLOBS PER SQ. M NORMAL 1 PER SQ. 5M (LIGHT - VERY LIGHT) | | BEACH SURVEY<br>OIL 1 MI SOUTH OF OCEAN CITY TO 2 MI SOUTH OF OCEAN SHORES | VISUAL SURVEY |
| 26 MAR 1530 | 425 | WDF/B INGVOL (LOCAL OYSTERMAN)<br>TWIN HARBORS, W OF BAY CITY IN GRAYS HARBOR | | BLOBS IN WATER | SCOOP & JAR AT BOAT LAUNCH |
| 26 MAR 1400 | 426 | WDF/G.LIPPERT<br>WILLAPA BAY, NAHCOTTA TO GRASSY ISL. TO TOKELAND | | SURFACE WATER & BEACH SURVEY<br>NO OIL IN BAY | VISUAL SURVEY |
| 27 MAR 1300 | 427 | WDF/T.HOOPER<br>TWIN HARBORS, WESTPORT TO NORTH COVE<br>SAMPLES TAKEN | | BEACH SURVEY<br>3-4 BLOBS PER SQ. M, "MODERATE TO HEAVY" OILING | VISUAL SURVEY |
| 27 MAR 1400 | 428 | WDF/SIMONS<br>COPALIS BEACH & MOCLIPS BEACH<br>TO CONNER CREEK NO OIL N. | | BEACH SURVEY<br>2-4" GLOBS EVERY 16 SQ. M | VISUAL SURVEY<br>OIL FROM 3 MI S OF OCEAN SHORE |
| 27 MAR 1100 | 429 | WDF/MOORE<br>LONG BEACH, LONG BEACH TO 4 MI N OF OYSTERVILLE | | BEACH SURVEY<br>SAME OILING AS BEFORE W/NEW AND OLD OIL | VISUAL SURVEY |
| 28 MAR 1200 | 430 | WDF/T.HOOPER<br>TWIN HARBORS<br>20 DEAD OILED BIRDS 4 SAMPLES, 2 AT Y-GAP & 2 AT XH. OIL BLOBS FROM BEACH INTO JARS, SAMPLES AT MONESA | | BEACH SURVEY<br>NO NEW OIL AND DECTEASE IN OIL (POSSIBLY BURIED) | VISUAL SURVEY |
| 28 MAR 1300 | 431 | WDF/BARRY<br>COPALIS BEACH<br>SAMPLS AT OCEAN CITY AND OYHUT | | BEACH SURVEY<br>MUCH LESS OIL (1" OR< GLOBS) | VISUAL SURVEY |
| 29 MAR 1400 | 432 | WDF/MOORE<br>LONG BEACH, LONG BEACH TO N OF OYSTERVILLE<br>7 RAZOR CLAM SAMPLES TAKEN AT 1.8 MI N OF OYSTERVILLE | | BEACH AND OYSTERS<br>LIGHTER W/SOME NEW OIL S OF O.V. BASEBALL SIZED BALLS | VISUAL SURVEY |

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|---|---|---|---|---|---|
| | | NOTES ..... | | | |
| 29 MAR 1000 | 433 | WDF/D. OLSON<br>WILLAPA BAY, RODESIA BEACH AT GOOSE PT. | | BEACH SURVEY<br>APP. 1/2 GAL. OF OIL PER MI AT TIDELINE | VISUAL SURVEY |
| | | SAMPLES TAKEN, CLEANUP IN PROGRESS | | | |
| 29 MAR 1300 | 434 | WDF/NEWMAN<br>TWIN HARBORS, WESTPORT TO NORTH COVE | | BEACH SURVEY<br>2 GLOBS (3-5CM) PER SQ. YD. AT HIGH TIDELINE (LIGHT TO | VISUAL SURVEY |
| | | MODERATE) | | | |
| 29 MAR 1000 | 435 | WDF/SIMONS<br>COPALIS BEACH | | BEACH SURVEY<br>OIL VERY LIGHT N OF CONNER CREEK LIGHT S OF CONNER CREEK | VISUAL SURVEY |
| | | 2 SAMPLES: 1/4 M N OF COPALIS GAP | | | |
| 30 MAR 1330 | 436 | WDF/NEWMAN<br>TWIN HARBORS, Y-GAP TO NORTH COVE | | BEACH SURVEY<br>NO NEW OIL. NORTH-LG BLOBS PER 50-150', S-NUMEROUS SM GLOBS | VISUAL SURVEY |
| | | >24 POOLS OF OIL 6-10 "=DIA AT NORTH COVE | | | |
| 30 MAR 1100 | 437 | WDF/RAMMER<br>COPALIS BEACH, COPALIS BEACH TO OCEAN SHORES | | BEACH SURVEY<br>LITTLE OIL AT N, BUT FRESH OIL AT HIGH TIDELINE AT CONNER C. | VISUAL SURVEY |
| | | MORE AT OCEAN CITY AND OYHUT W/SAMPLES THERE/OCEAN | | SHORES S A LITTLE OIL. SM GOOSENECK BARNICLES GROWING | |
| 31 MAR 1300 | 438 | WDF/RAMMER<br>TWIN HARBORS, Y-GAP TO NORTH COVE | | BEACH SURVEY<br>1 POOL FRESH OIL APP 8" ACROSS AT N COVE 6-8 TARBALLS IN ALL | VISUAL SURVEY |
| | | OIL PROBABLY BURIED BY SAND | | | |
| 1 APR | 439 | WDF/SIMONS<br>TWIN HARBORS, Y-GAP TO S OF NORTH COVE | | BEACH SURVEY<br>VERY LIGHT 10 2-6 OIL BALL ON WHOLE AREA | VISUAL SURVEY |
| 4 APR | 440 | WDF/MOORE<br>LONG BEACH, OCEAN PARK TO 1 MI N OF OCEAN PARK | | BEACH SURVEY<br>DIME SIZE OIL, 1 PER 30' AT TIDELINE | VISUAL SURVEY |
| 21 MAR 1600 | 441 | WDF/MOORE<br>LONG BEACH, LONG BEACH TO OYSTERVILLE, 6 SITES | | CLEAN SAND (PRE-OILED)<br>CLEAN SAMPLES IN STORAGE AT WDF NAHCOTTA | SCOOPS &JARS |
| 21 MAR 1600 | 442 | WDF/MONTESANO LAB<br>COPALIS BEACH, TWIN HARBORS, MOCKROCKS BEACH | | BEACH SAMPLES (PRE-OILED)<br>BACKGROUND SAMPLES IN STORAGE AT WDF/MONTESANO LAB | SCOOPS AND JARS |
| 22 MAR 1200 | 443 | WDF/CRAB FISHERMAN<br>CRAB FISHING AREAS | | NETS/LINE/CRAB<br>NO REPORTED OILING | VISUAL SURVEY |
| 29 MAR 1529 | 444 | WDF/MEEKIN<br>BACHELOR SLOUGH (RM 89) | 141269 | FISH, WATER SAMPLE ALSO<br>ORION PH METER NO FISH MORTALITIES | LIVEBOXES,YSI D.E. METER, |
| | | WATER CHEM. PARAMERS-CONDUCTIVITY,TOTAL HARDNESS,TOTAL ALKALINITY,PH, TEMPERATURE | | | |
| 28 MAR 1400 | 445 | WDF/MOORE<br>OCEAN PARK H20 LINE | WDF-88-1 | BEACH TARBALL | ALUMINUM FOIL |
| | | ORIGINALLY TRACKED AS OP-28-84 | | | |
| 28 MAR 1215 | 446 | LONG BEACH APPROACH | WDF-88-2 | BEACH TARBALL | ALUMINUM FOIL |
| 28 MAR 1300 | 447 | AT TIDE LINE | WDF-88-3 | BEACH TARBALL | ALUMINUM FOIL |
| 28 MAR 1400 | 448 | WDF/MOORE<br>H20 LINE EDGE, OCEAN PARK | WDF-8U8-4 | BEACH TARBALL | ALUMINUM FOIL |
| 28 MAR | 449 | WDF/MOORE<br>OYSTERVILLE + 1/8 H20 LINE | WDF-88-5 | BEACH TARBALL | ALUMINUM FOIL |
| 28 MAR 1230 | 450 | WDF/MOORE<br>LONG BEACH APPROACH + 1/4 | WDF-88-6 | BEACH TARBALL | ALUMINUM FOIL |

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| 28 MAR 1300 | 451 | WDF/MOORE TIDE LINE | WDF-88-7 | BEACH TARBALL | ALUMINUM FOIL |
| 28 MAR 1400 | 452 | WDF/MOORE OCEAN PARK H2O LINE EDGE | WDF-88-8 | BEACH TARBALL | ALUMINUM FOIL |
| 28 MAR | 453 | WDF/MOORE OYSTERVILLE + 1/8 H2O LINE | WDF-88-9 | BEACH TARBALL | ALUMINUM FOIL |
| 28 MAR 1200 | 454 | WDF/MOORE LONG BEACH APPROACH + 1/4 | WDF-88-10 | BEACH TARBALL | ALUMINUM FOIL |
| 28 MAR 1300 | 455 | TIDE LINE | WDF-88-11 | BEACH TARBALL | ALUMINUM FOIL |
| 28 MAR | 456 | WDF/MOORE OYSTERVILLE + 1/8 H2O LINE | WDF-88-12 | BEACH TARBALL | ALUMINUM FOIL |
| 28 MAR | 457 | WDF/SIMONS AREA XH | WDF-88-13 | BEACH TARBALL | JAR |
| 28 MAR | 458 | WDF/SIMONS AREA XH | WDF-88-14 | BEACH TARBALL | JAR |
| 28 MAR | 459 | WDF/SIMONS GRAYLAND, Y-GAP | WDF-88-15 | BEACH TARBALL | JAR |
| 28 MAR | 460 | WDF/SIMONS GRAYLAND, Y-GAP | WDF-88-16 | BEACH TARBALL | JAR |
| 28 MAR | 461 | WDF/SIMONS 1/4 MI SOUTH OF OYEHUT | WDF-88-17 | BEACH TARBALL | JAR |
| 28 MAR | 462 | WDF/SIMONS 1/4 MI SOUTH OF OYEHUT | WDF-88-18 | BEACH TARBALL | JAR |
| 28 MAR | 463 | WDF/SIMONS 3/4 MI SOUTH OF OCEAN CITY | WDF-88-19 | BEACH TARBALL | JAR |
| 28 MAR | 464 | WDF/SIMONS 3/4 MI SOUTH OF OCEAN CITY | WDF-88-20 | BEACH TARBALL | JAR |
| 20 MAR 1135 | 465 | NMFS/MCCONNEL END OF RICE ISLAND | | SURFACE WATER FIRST SIGHTINGS OF OIL SHEEN | VISUAL SURVEY |
| 1 MAR | 466 | NMFS/HAMMOND LAB AT 19 NMFS ESTUARY STUDY SITES | | CRAB DISTRIBUTION PRE-SPILL BACKGROUND SAMPLES | 8M TRAWL/5MI? TOWS |
| 12 MAR | 467 | NMFS/HAMMOND LAB CATHLAMET BAY 4 SITES | | BOTTOM 16 SAMPLES AT EACH SITE BY DIVERS. PRE-SPILL | 8 M TRAWLS & TUBE CORER |
| 19 MAR 1400 | 468 | USFWS/HAGEDORN CATHLAMET TO STELLA | | BANK AREA NO OIL VISABLE | VISUAL SURVEY |

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| 19 MAR 1400 | 469 | USFWS/CLARK<br>CATHLAMET/SLOUGH AREAS AROUND REFUGE | | BANK AREA<br>NO OIL VISABLE | VISUAL SURVEY |
| 20 MAR 1000 | 470 | USFWS/HAGEDORN<br>SLOUGHS AROUND CATHLAMET<br>OIL IN DURING HIGH TIDE SO STICKING TO BEACHES | | SLOUGH AND RIVER BEACHES<br>OIL SLICK IN ELOCHMAN, STEAMBOAT, AND BROOKS SLOUGHS | VISUAL SURVEY |
| 20 MAR 1400 | 471 | USFWS/HAGEDORN<br>HARRINGTON POINT | | BEACH AND WATER SURFACE<br>SHEEN ABOUT 50 YDS OFF SHORE | VISUAL SURVEY |
| 21 MAR 1000 | 472 | USFWS/CLARK<br>CATHLAMET TO FITZPATRICK ISLS. | | BEACH AND SLOUGH AREAS<br>OILED BIRDS AND DEBRIS IN BRUSH LINE | VISUAL SURVEY |
| 21 MAR 1400 | 473 | USFWS/CLARK<br>HUNTING IS., PRICE IS. & ELOCHOMAN SLOUGH | | RIVER & SLOUGH AREAS<br>OIL GLOBS AT MOUTH OF SLOUGH OIL IN AT HIGH TIDE | VISUAL SURVEY |
| 21 MAR 1000 | 474 | USFWS/HAGEDORN<br>GRAY'S BAY | | SURFACE WATER<br>OIL GLOBS AT HARRINGTON POINT ON BEACH | VISUAL SURVEY |
| 22 MAR 1000 | 475 | USFWS/HAGEDORN<br>ASTORIA TO LONGVIEW | | RIVER SURVEY<br>ACCUMULATION AT S. OF MOUTH AND FROM STELLA TO GRAY'S BAY | HELO SURVEY NOTES |
| 22 MAR 1000 | 476 | USFWS/CLARK<br>RICE IS.,MILLER SAND, JIMCROW SANDS, HUNTING IS. | | BEACHES & MARSHES<br>OIL ON BEACHES AND IN MARSHES | VISUAL SURVEY |
| 23 MAR 1000 | 477 | USFWS/CLARK<br>CARLSON, RUSH, LOIS & MARSH ISLANDS<br>SET UP BIRD CLEANING CENTER | | BEACH SURVEY<br>SOME OIL ON BEACH | VISUAL SURVEY |
| 28 MAR 1300 | 478 | ODEQ/SUTHERLAND<br>BUOY 72, 75 & 77 MID-CHANNEL UPSTM. OF DEER ISL. | DEQ-1 | BOTTOM<br>NO OIL | CANNONBALL |
| 28 MAR 1330 | 479 | ODEQ/SUTHERLAND<br>TRANSECT ST. HELENS BAR TO ST. HELENS<br>3 DROPS, 100 FT OFFSHORE ON EACH SIDE AND MID-CHANNEL | DEQ-2 | BOTTOM<br>SMALL AMT OF OIL NEXT TO ST. HELENS BAR | CANNONBALL |
| 29 MAR 1149 | 480 | ODEQ/SUTHERLAND ODFW/JONES<br>WAONA RM 42 TRANSECT<br>10'-40' DEEP | DEQ-3 | BOTTOM<br>NO OIL | CANNONBALL |
| 29 MAR 1130 | 481 | ODEQ/SUTHERLAND ODFW/JONES<br>SW SIDE PUGET ISLAND, WELCOME SLOUGH, BRADWOOD | DEQ-4 | SHORELINE<br>NOTED SMALL AMTS OF SHEEN IN WELCOME SLOUGH | VISUAL SURVEY |
| 29 MAR 1230 | 482 | ODEQ/SUTHERLAND<br>CLIFTON CHNL-2 SITES BRADWD,TRANS CLIFT-MULT SLOUG<br>5'-50' DEEP | DEQ-5 | BOTTOM<br>NO OIL | CANNONBALL |
| 29 MAR 1230 | 483 | ODEQ/SUTHERLAND ODFW/JONES<br>SHORELINE CLIFTON CHANNEL & PRAIRE CHANNEL | DEQ-6 | SHORELINE<br>NOTED A FEW PATCHES OF OIL ON NORTH SIDE OF MARSH ISL. | VISUAL SURVEY |
| 29 MAR 1330 | 484 | ODEQ/SUTHERLAND<br>PRAIRIE CHANNEL-TRANSECT HORSESHOE ISL & RM 25 | DEQ-7 | BOTTOM<br>NO OIL | CANNONBALL |
| 29 MAR 1400 | 485 | ODEQ/SUTHERLAND<br>WENDY ISLAND CHANNEL 4 SITES | DEQ-8 | BOTTOM<br>NO OIL | CANNONBALL |
| 29 MAR 1430 | 486 | ODEQ/SUTHERLAND<br>JIM CROW SANDS<br>AMTS) | DEQ-9 | BEACH SURVEY<br>NOTED DIME SIZE OIL SPOTS ON BEACH AT HIGH TIDE LINE (MINOR | VISUAL SURVEY |

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| 29 MAR 1515 | 487 | ODEQ/SUTHERLAND ODFW/JONES<br>THREE TREE PT TO STEAMBOAT SLOUGH | DEQ-10 | BOTTOM<br>VERY SMALL AMTS NEAR LOWER END OF PRICE ISLAND | CANNONBALL |
| 29 MAR 1500 | 488 | ODEQ/SUTHERLAND<br>THREE TREE PT. TO CATHLAMET<br>HUNTING ISLAND | DEQ-11 | SHORELINE<br>NOTES SOME OIL ON SHORE PARTICULARLY ALONG LOWER END OF | VISUAL SURVEY |
| 29 MAR 1630 | 489 | ODEQ/SUTHERLAND<br>BERNIE SLOUGH, WALLACE SLOUGH, BRADBURY SLOUGH | DEQ-12 | BOTTOM<br>NO OIL | CANNONBALL |
| 29 MAR 1720 | 490 | ODEQ/SUTHERLAND<br>BRADBURY SLOUGH & WALLACE SLOUGH | DEQ-13 | SHORELINE<br>NO OIL | VISUAL SURVEY |
| 30 MAR 0900 | 491 | ODEQ/SUTHERLAND<br>JOHN DAY CHANNEL, PRAIRIE CHANNEL, KNAPPA SLOUGH | DEQ-14 | BOTTOM<br>NO OIL | CANNONBALL |
| 30 MAR 0900 | 492 | ODEQ/SUTHERLAND<br>LOIS ISLAND RM 18 | DEQ-15 | BEACH SURVEY<br>FOUND OCCASIONAL TARBALLS ON INTER-TIDAL AREA 4"-6" | VISUAL SURVEY |
| 30 MAR 0900 | 493 | ODEQ/SUTHERLAND<br>SOUTH CHANNEL, PRAIRIE CHANNEL, KNAPPA SLOUGH | DEQ-16 | SHORELINE<br>NO OIL SITED | VISUAL SURVEY |
| 19 MAR 1200 | 494 | ODEQ/KOLLIAS<br>GOBLE BOAT DOCK<br>DIME TO QUARTER SIZE, FLOATING ON SURFACE AND GIVEN OFF SHEEN | DEQ-17 | SURFACE WATER<br>SCATTERING OF OIL GLOBULES FOUND | VISUAL SURVEY |
| 19 MAR 1300 | 495 | ODEQ/KOLLIAS<br>FISHER ISLAND SLOUGH<br>CONTINUOUS LAYER WITH SOME STREAKS OF OPEN WATER; SOME IS REDDISH-FOAM, INDICATIVE OF EMULSION FORMATIO | DEQ-18 | SURFACE WATER<br>OIL FLOATING ON SURFACE OF SLOUGH | VISUAL SURVEY |
| 28 MAR 1230 | 496 | ODEQ/SMITS<br>CLATSOP SPIT | DEQ-19 | BEACH SURVEY<br>3-4 SMALL PANCAKE SIZED OIL GLOBULES PER SQ. YD.--SPOTTY | VISUAL SURVEY |
| 28 MAR 1300 | 497 | ODEQ/SMITS<br>SOUTH JETTY, RIVERSIDE, NEAR PARKING AREA<br>SOME EEL GRASS COATED WITH OIL | DEQ-20 | BANK AREA<br>1 DEAD BIRD - SOME OIL-PANCAKE SIZE - SCATTERED | VISUAL SURVEY |
| 28 MAR 1330 | 498 | ODEQ/SMITS<br>HAMMOND BOAT BASIN<br>IN 20' X 20' AREA | DEQ-21 | BANK AREA<br>SM AREA OF EEL GRASS COATED WITH OIL-SOME OIL PANCAKE SIZE | VISUAL SURVEY |
| 24 MAR | 499 | ODFW/BOITZ<br>BONNEVILLE TO GOBLE | | ANGLER BEACH SURVEY<br>NO OIL PROBLEMS NOTED | VISUAL SURVEY |
| 22 MAR | 500 | ODFW/LINK<br>JETTY SANDS AND OCEAN BEACH | | BEACH SURVEY<br>OIL ON JETTY SANDS BUT NONE ON OCEAN BEACHES | VISUAL SURVEY |
| 22 MAR 1000 | 501 | ODFW/BOHN<br>ASTORIA TO ST. HELENS | | ANGLER BEACH SURVEY<br>STREAKS OF OIL IN ESTUARY UP TO JIM CROW AND AT FISHER ISL. | VISUAL SURVEY |
| 20 MAR 1400 | 502 | ODEQ/SUTHERLAND<br>SHIP SITE TO STELLA | | SURFACE WATER & BEACH SURVEY<br>OIL STREAKS FROM SHIP, BEACHES OILED- LONGVIEW | VISUAL (HELO OVERFLIGHT) |
| 29 MAR | 503 | ODFW/WEBER<br>CLATSOP BEACH | | BEACH SURVEY<br>4-8" BLOBS ON BEACH, NO DENSITY NOTED, NO SAMPLES | VISUAL SURVEY |
| 6 APR | 504 | ODFW/WEBER<br>CLATSOP BEACH<br>8-10 OILED BIRDS IN 6 MI OF BEACH | | BEACH SURVEY<br>OIL ON BEACH - 4-8" BLOBS | VISUAL SURVEY |

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| 27 MAR 1000 | 505 | ODFW/BOITZ<br>ASTORIA TO BONNEVILLE<br>BEACH & BOAT SAMPLES AT SAME TIME | | ANGLER BEACH SURVEY<br>PATCHES OF OIL FROM LONGVIEW BRIDGE TO LOWER WALLACE ISL. | VISUAL SURVEY |
| 24 MAR 1200 | 506 | ODFW/BOITZ<br>PRESCOTT BEACH , DIBBLE ISL. & ST. HELENS | | ANGLER BEACH SURVEY<br>NOT YET AVAILABLE | INTERVIEWS |
| 24 MAR 1200 | 507 | ODFW/BOITZ<br>ASTORIA TO BONNEVILLE | | ANGLER BEACH SURVEY<br>OIL SHEEN AT FISHER ISLAND AND IN ESTUARY | VISUAL SURVEY |
| 22 MAR | 508 | ODFW/BOITZ<br>ASTORIA TO BONNEVILLE<br>BEACH & BOAT SURVEYS AT SAME TIME | | ANGLER BEACH SURVEY<br>NO OIL NOTED ON REPORT FORMS | VISUAL SURVEY |
| 30 MAR | 509 | ODFW/HREHA<br>ASTORIA AREA SEAFOOD PROCESSORS | | LONGLINE AND TRAWL CAUGHT FISH<br>NO REPORTED PROBLEMS WITH OILED FISH | INTERVIEWS |
| 28 MAR 1040 | 510 | WDOE/KITTLE<br>ELOCHOMAN SLOUGH<br>WATER PARAMETERS-CONDUCTIVITY,TOTAL HARDNESS, TOTAL ALKA- LINITY, PH,TEMPERATURE | 141268 | WATER, FISH BOX<br>NO FISH MORTALITIES | JAR, IN-SITU BIOASSAY |
| 20 MAR 1200 | 511 | WDF/WALL<br>COLUMBIA RIVER, RM 12-20 (ASTORIA)<br>-SAMPLERS AWARE OF SPILL. NO SIGN OF OIL IN WATER OR PICKED UP BY NET. NO SIGN OF OIL ON FISH | | FISH<br>NETTED 2 STURGEON (TAGGED & RELEASED) | COMMERCIAL GILLNET |
| 21 MAR 0730 | 512 | WDF/JAMES<br>COLUMBIA RIVER, RM 31-34 (SKAMOKAWA)<br>HAVE HAD OIL. NO SAMPLES TAKEN. NET PICKED UP 12-18 TARBALLSTOW ENDED AT 11:00 | | FISH<br>EXAMINED APP 24 STURGEON FOR OIL IN GILLS, 2 OF WHICH MAY | COMMERCIAL GILLNET |
| 23 MAR | 513 | WDF/WALL<br>COLUMBIA RIVER, RM 40-110 FISH SAMPLED AT BUYERS<br>AND ENTRAILS OF 1 FISH. HEAD AND ENTRAILS STORED IN FREEZER | | FISH<br>EXAMINED 18 STURGEON FOR OIL, NONE VISIBLE. COLLECTED HEAD | COMMERCIAL SETLINE |
| 24 MAR 0930 | 514 | WDF/JAMES<br>COLUMBIA RIVER, RM 31-34 (SKAMOKAWA)<br>ECTED 22 STURGEON, 6 SALMON, 1 STEELHEAD. PHOTOGRAPHS TAKEN EXAMINED & TAGGED AN ADDITIONAL 34 STURGEON F | | FISH<br>OIL FOUND IN MOUTH OF 13 OF THE 22 STURGEON COLLECTED. COLL- | COMMERCIAL GILLNET |
| 26 MAR 1430 | 515 | WDF/JAMES<br>COLUMBIA RIVER, RM 101 (ENTRANCE TO WILLAMETTE RV.<br>STORED IN FREEZER. FINISHED FISHING AT 1630 | | FISH<br>COLLECTED 4 STURGEON, NO OUTWARD SIGNS OF OIL | HOOK AND LINE (SPORT) |
| 2 APR 1400 | 516 | WDF/WALL<br>COLUMBIA RIVER, RM 124 (CORBETT)<br>CHECKED A TOTAL OF 49 STURGEON, 10 SALMON - SAMPLES FROZEN | | FISH<br>COLLECTED 4 STURGEON, 1 SALMON, NO OUTWARD SIGNS OF OIL | COMMERCIAL GILLNET |
| 2 APR 0900 | 517 | ODFW/HIROSE<br>COLUMBIA RIVER, RM28 (WOODY ISLAND)<br>HEAD COLLECTED. CHECKED A TOTAL OF 62 STURGEON, 17 SALMON, 2 STEELHEAD, NO OIL FOUND. SAMPLES STORED IN | | FISH<br>NO OUTWARD SIGNS OF OIL FOUND ON 2 STURGEON,1 SALMON,1 STEEL | COMMERCIAL GILLNET |
| 2 APR | 518 | ODFW/B JAMES<br>COLUMBIA RIVER, RM 28 (WOODY ISLAND)<br>SPRING CHINOOK, 1 STEELHEAD. 62 STURGEON, 15 SPRING CHINOOK2 STEELHEAD CAUGHT ON DRIFT | | FISH<br>OILY DEBRIS ON LEADLINE, NO OIL NOTED ON FISH -2 STURGEON, 1 | COMMERCIAL GILLNET |
| 2 APR | 519 | ODFW/B JAMES<br>COLUMBIA RIVER, RM 124 (CORBETT)<br>FISH. 49 STURGEON, 10 SPRING CHINOOK CAUGHT ON DRIFT. | | FISH<br>4 STURGEON, 1 SPRING CHINOOK COLLECTED, NO OIL OBSERVED ON | COMMERCIAL GILLNET |
| 21 MAR 1400 | 520 | WDNR/B LACEY<br>COLUMBIA RIVER, COUNTY LINE PARK, RM 53 | | BEACH TARBALL<br>TARBALL < 1 SQ M. SIZE:QUARTER WIDTH:4-5 FT | VISUAL SURVEY |
| 22 MAR 1650 | 521 | NMFS/MCCONNEL<br>ASTORIA BRIDGE, DERDENORA SANDS, DANSY PT.<br>AND LONG BEACH PENNINSULA TO SEAVIEW | | FISH<br>OILED FISH, OIL ON BEACHES AT YOUNG'S BAY TO LEWIS & CLARK R | SHRIMP TRAWLS - 3 HAULS |
| 28 MAR 1400 | 522 | WDOE/KITTLE<br>COLUMBIA R. BEACH, WAHINGTON ST. RM 8 | | BEACH SURVEY<br>OIL ON BEACH, GLOBS QUARTER SIZE, 2-3 SQ M. , BAND WIDTH 1 M | VISUAL SURVEY |

NOAA/HAZMAT SAMPLE TRACKING FOR THE MOBILOIL SPILL (BY SEQ. #) HSTR07
REPORT DATE: 12 JUL 1984

| DATE / TIME | SEQ. # | AGENCY / NAME / LOCATION(S) / NOTES | FIELD TAG# | WHAT WAS SAMPLED / RESULTS | METHOD USED |
|---|---|---|---|---|---|
| 29 MAR | 523 | WDF/MEEKIN | | FISH AND WATER PARAMETERS | IN-SITU BIOASSAY |
| | | ELOCHOMAN SLOUGH -COLUMBIA RIVER (RM 39 | | NO FISH MORTALITIES | |
| | | WATER PARAMETERS-CONDUCTIVITY, TOTAL HARDNESS,TOTAL | | ALKALINITY,PH, TEMPERATURE | |
| 31 MAR | 524 | WDF/MEEKIN | | FISH AND WATER PARAMETERS | IN-SITU BIOASSAY |
| | | ELOCHOMAN SLOUGH-COLUMBIA RIVER (RM 39) | | NO FISH MORTALITIES | |
| | | WATER CHEMISTRY PARAMETERS-CONDUCTIVITY,TOTAL HARDNESS, | | TOTAL ALKALINITY,PH,TEMPERATURE | |
| 27 MAR | 525 | WDOE/KITTLE | | FISH AND WATER PARAMETERS | IN-SITU BIOASSAY |
| 0903 | | ELOCHOMAN SLOUGH, RM 39 | | WATER TEMP. 7.1C.,D.O. 12.0 PPM, PH 7.7, NO FISH MORTALITIES | |
| | | OIL GLOBULES ABOUT 1/SQ.M, SIZE 1 1/2 IN DIAM, RAINBOW | | STREAK SHEEN, WIDTH ABOUT 5 M FROM ISLAND SHO | |
| 26 MAR | 526 | WDOE/KITTLE | | FISH | IN-SITU BIOASSAY |
| 1830 | | ELOCHOMAN SLOUGH - RM 39 | | WATER TEMP. 7.5C, PH 7.2, D.O. 12.1 PPM | |
| | | OIL GLOBULES AND STREAKS ON THE WATER SURFACE. 3 LIVE BOXES 20 FISH/BOX | | | |
| 2 APR | 527 | WDF/MEEKIN | | FALL CHINOOK JUVENILES (CNTRL) | LIVE BOX BIO-ASSAY |
| 1300 | | BACHELOR SLOUGH (RM 91.6) | | ALL CONTRL FISH SURVIVED | |
| | | 2 FISH WERE TAKEN FROM 2 LIVE BOXES AND 5 FISH WERE TAKEN | | FROM THE 3RD LIVE BOX (3 SAMPLES TOTAL) | |
| 2 APR | 528 | WDF/MEEKIN | | FALL CHINOOK JUVENILES-TEST | FLIVE BOX BIOASSAY |
| 0840 | | ELOCHOMAN SLOUGH (RM 39.1) | | TEST FISH IN BOXES 1 AND 2 SURVIED FOR 160 HOURS. 2 FISH | |
| | | EACH TAKEN ROM 2 LIVE BOXES. TWO SAMPLES TOTAL | | | |
| 30 MAR | 529 | WDF/MEEKIN | | FALL CHINOOK JUVENILES -TEST | LIVE BOX BIOASSAY |
| 1040 | | ELOCHOMAN SLOUGH (RM 39.1) | | TEST BOX #3 LIVE BOX WASHED ON LOGBOOM BY SHIP WAKE-ALL 20 | |
| | | FISH DEAD.20 FISH TAKEN AS SAMPLE-TOTAL BIOASSAY TIME AT 90 HOURS.WATER CHEM. PARAMETERS-CONDUCTIVITY,TOT | | | |
| 31 MAR | 530 | WDF/MEEKIN | | FISH | 50 FT. BEACH SEINE |
| 1530 | | WOOTLAND BAR (RM 82) | | SEVEN CHINOOK JUVENILES AND ONE CHUM JUVENILE WERE SEINED | |
| | | EIGHT SEINE HAULS WERE MADE. TOTAL OF ONE SAMPLE | | | |
| 28 MAR | 531 | WDF/MEEKIN | | BEACH SURVEY | PICKED UP ON BEACH |
| 1745 | | WOODLAND BAR (RM 82) | | ONE CUM SALMON JUVENILE AND ONE FRESHWATER CLAM | |
| 31 MAR | 532 | WDF/MEEKIN | | FISH | LIVE BOXES,YSI D.E. METER |
| | | BACHELOR SLOUGH (RM 89) | | ORION PH METER NO FISH MORTALITIES | |
| | | WATER CHEM PARAMETERS-CONDUCTIVITY,TOTAL HARDNESS,TOTAL | | ALKALINITY,PH,TEMPERATURE | |
| 30 MAR | 533 | WDF/MEEKIN | | FISH | LIVEBOXES,YSI D.E. METER |
| | | BACHELOR SLOUGH (RM 89) | | ORION PH METER NO FISH MORTALITIES | |
| | | WATER CHEM. PARAMETERS - CONDUCTIVITY, TOTAL HARDNESS, | | TOTAL ALKALINITY, PH, TEMPERATURE | |
| 28 MAR | 534 | WDF/MEEKIN | | FISH | LIVEBOXES,YSI D.E. METER, |
| | | BACHELOR SLOUGH (RM 89) | | ORION PH METER NO FISH MORTALITIES | |
| | | WATER CHEM. PARAMETERS-CONDUCTIVITY, TOTAL HARDNESS,TOTAL | | ALKALINITY, PH, TEMPERATURE | |
| 27 MAR | 535 | WDOE/KITTLE | | FISH | LIVEBOXES,YSI D.E. METER, |
| | | BACHELOR SLOUGH (RM 89) | | ORION PH METER FISH APPEAR NORMAL | |
| | | LIVEBOX INSTALLATION. NO OIL ON SITE.WATER CHEM PARAMETERS: TOTAL HARDNESS,CONDUCTIVITY,TOTAL ALKALINITY, | | | |
| 25 MAR | 536 | USFWS/BRITTON | | FISH | N/A |
| | | ELOCHOMAN SLOUGH | | ONE STURGEON OILED CARCASS | |
| 27 MAR | 537 | ODFW/BENNET | | ANGLER BEACH SURVEY | VISUAL SURVEY |
| | | BONNEVILLE TO ASTORIA | | FLOATING OIL IN PUGET ISL. AREA NOT IN MID-STREAM. OIL AT | |
| | | STELLA,NASSA,CAPE HORN, FLANDERS | | | |
| 27 MAR | 538 | ODFW/BOITZ | | ANGLER BEACH SURVEY | VISUAL SURVEY |
| | | PRESCOTT AND DIBBLIE POINT | | LINES AND LUES FOULED WITH OIL | |
| 2 APR | 539 | ODFW/GALBREATH | | TEST FISHING,DRIFT NETTING | 1200 FT. DIVER NET WITH APRON |
| | | BELOW 3-TREE PT. TO JIM CROW SANDS | | OIL ON BOTTOM 6 INCHES OF NET ON WASH. HALF OF NET. | |
| | | SAMPLE FISH BEING CHECKED BY WDOE/KITTLE | | | |
| 4 APR | 540 | ODFW/GALBREATH | | TEST FISHING DRIFT NETTING | 1200 FT. DIVER NET WITH APRON |
| | | BEOW 3 TREE PT. TO JIM CROW SANDS | | LESS OIL. OIL COATED LEAVES ONLY A FEW CLUMPS | |
| | | SAMPLE FISH BEING CHECKD BY WDOE/KITTLE | | | |

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|---|---|---|---|---|---|
| | | NOTES ..... | | | |
| 8 APR | 541 | ODFW/GALBREATH<br>BELOW 3 TREE PT. TO JIM CROW SANDS | | TEST FISHING DRIFT NETTING<br>SMALL AMOUNT OF OILED DEBRIS AT BOTTOM ON WASH SIDE | 1200 FT. DIVER NET WITH APRON |
| | | SAMPLE FISH BEING CHECKED BY WDOE/KITTLE | | | |
| 10 APR | 542 | ODFW/GALBREATH<br>BELOW 3 TREE PT. TO JIM CROW SANDS | | TEST FISHING DRIFT NETTING<br>OILED DEBIRS IN SPOTS ON WASH. SIDE OF NET | 1200 FT. DIVER NET WITH APRON |
| | | SAMPLE FISH BEING CHECKED BY WDOE/KITTLE | | | |
| 24 MAR<br>1000 | 543 | RAMSEY THEN TO WDF/MOORE<br>BEARDS HOLLOW | | FISH<br>OIL ON SCALES AND IN MOUTH OF OCEAN PERCH | BEACH FISHING |
| | | FISHERMAN CAUGHT THESE ON BEACH THEN CALLED WDF | | | |
| 17 APR<br>1840 | 544 | NOAA/PAYTON<br>FIRST BEACH, WA. (SOUTH LA PUSH) | A-108-1 | BEACH TARBALL | HEXANE CLEANED BOTTLE |
| | | FOIL LINED LID | | | |
| 17 APR<br>1840 | 545 | NOAA/PAYTON<br>FIRST BEACH, WA. (SOUTH OF LA PUSH) | A-108-2 | BEACH TARBALL | HEXANE CLEANED BOTTLE, |
| | | FOIL LINED LID | | | |
| 17 APR<br>1800 | 546 | NOAA/GLEASON<br>CAPE ALAVA BEACH, WASHINGTON | B-108-1 | BEACH | STICK |
| | | JARS CLEANED WITH ACETONE | | | |
| 17 APR<br>1800 | 547 | NOAA/GLEASON<br>CAPE ALAVA BEACH, WASHINGTON | B-108-2 | BEACH | STICK |
| | | JARS CLEANED WITH ACETONE | | | |
| 17 APR<br>1800 | 548 | NOAA/GLEASON<br>CAPE ALAVA BEACH, WASHINGTON | B-108-3 | BEACH | STICK |
| | | JAR CLEANED WITH ACETONE | | | |
| 29 MAR<br>1140 | 549 | ODEQ/SUTHERLAND<br>SAND ISLAND | | BEACH SURVEY<br>NO OIL FOUND. NOTED PLASTIC BAGS ON BEACH. | VISUAL SURVEY |
| 29 MAR<br>1200 | 550 | ODEQ/SUTHERLAND<br>WELCOME SLOUGH | | WATER SURVEY<br>NOTED SLIGHT SHEEN AND A FEWE SMALL FLOATING GLOBS | VISUAL SURVEY |
| 29 MAR<br>1230 | 551 | ODEQ/SUTHERLAND<br>TENASILAHE ISLAND, NEAR TIP | | BEACH & WATER SURVEY<br>NO OIL FOUND | CANNONBALL |
| | | NO OIL ON BEACH ON SOUTH OR NORTH SIDE | | | |
| 29 MAR<br>1320 | 552 | ODEQ/SUTHERLAND<br>QUEINAS ISLAND, ORE. SIDE;TRONSOW ISL., ORE.SIDE | | WATER SURVEY<br>NO OIL FOUND | VISUAL SURVEY |
| 29 MAR<br>1340 | 553 | ODEQ/SUTHERLAND<br>UPPER PRAIRIE SLOUGH, JUNC. OF PRAIRIE,MARSH,KARSL | | WATER SURVEY<br>NO OIL FOUND | VISUAL SURVEY |
| 29 MAR<br>1358 | 554 | ODEQ/SUTHERLAND<br>MARSH ISLAND SLOUGH | | WATER SURVEY<br>NO OIL FOUND | VISUAL SURVEY |
| | | NOTED YOUNG BALD EAGLE | | | |
| 29 MAR<br>1454 | 555 | ODEQ/SUTHERLAND<br>OUTSIDE & BETWEEN WOODY & HORSESHOE ISLANDS | | BOTTOM<br>NO OIL FOUND | CANNONBALL |
| 29 MAR<br>1500 | 556 | ODEQ/SUTHERLAND<br>WOODY ISLAND, CHANNEL MARKER | | BOTTOM<br>NO OIL FOUND | CANNONBALL |
| 29 MAR<br>1609 | 557 | ODEQ/SUTHERLAND<br>ELOCHOMAN SLOUGH, MID-CHANNEL | | BOTTOM<br>NO OIL FOUND | CANNONBALL |
| 29 MAR<br>1716 | 558 | ODEQ/SUTHERLAND<br>BEAVER TERMINAL, UPPER END OF DOCKS | | BOTTOM<br>NO OIL FOUND | CANNONBALL |

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|---|---|---|---|---|---|
| 29 MAR 1723 | 559 | ODEQ/SUTHERLAND<br>CRIMS ISLAND, MID-CHANNEL<br>NO OIL ON SHORE | | BOTTOM<br>NO OIL FOUND | CANNONBALL |
| 29 MAR 1730 | 560 | ODEQ/SUTHERLAND<br>STELLA | | BOTTOM<br>NO OIL FOUND | CANNONBALL |
| 30 MAR 0930 | 561 | ODEQ/SUTHERLAND<br>CORPS OF ENGINEERS OFFICE FRONT, 100' OFF DOCK | | BOTTOM<br>NO OIL FOUND | CANNONBALL |
| 30 MAR 0945 | 562 | ODEQ/SUTHERLAND<br>MOTT ISLAND, INSIDE EDGE | | BOTTOM<br>NO OIL FOUND | CANNNONBALL |
| 30 MAR 1005 | 563 | ODEQ/SUTHERLAND<br>SVENSON CHANNEL | | WATER SURVEY<br>NO VISIBLE OIL | VISUAL SURVEY |
| 30 MAR 1018 | 564 | ODEQ/SUTHERLAND<br>PRAIRIE CHANNEL, MID-CHAN BTW SVENS. & RUSS. ISLS. | | BOTTOM<br>NO OIL FOUND | CANNONBALL |
| 30 MAR 1030 | 565 | ODEQ/SUTHERLAND<br>LOWER END OF'MINAKUR ISLAND | | BEACH SURVEY<br>NO OIL FOUND | VISUAL SURVEY |
| 30 MAR 1048 | 566 | ODEQ/SUTHERLAND<br>ENTRANCE TO BLIND SLOUGH | | VEGETATION<br>NO OIL FOUND | VISUAL SURVEY |
| 30 MAR 1100 | 567 | ODEQ/SUTHERLAND<br>SEAL ISLAND, OUTER EDGE<br>NO OIL ON VEGETATION | | BOTTOM<br>NO OIL FOUND | CANNONBALL |
| 19 MAR 0900 | 568 | ODFW/KING<br>RM 88 TO RM 65 | | RIVER SURFACE<br>SLICK FROM RM 88 TO RM 65, OIL IN FISHER SLOUGH | ANGLER SURVEY |
| 19 MAR 1500 | 569 | ODFW/JONES<br>RM 88 (SITE) TO RM (COTTONWOOD ISLAND) | | RIVER SURFACE & BEACH<br>50 PCT COVERAGE TO KALAMA 15 PCT COVERAGE AT RAINIER | VISUAL SURVEY (HELO) |
| 20 MAR 1100 | 570 | ODFW/BENNET<br>WESTPORT TO WOODY ISLAND<br>TAR BALLS ON TENESILLEHE IS. AND OIL POCKETS AROUND WOODY IS | | RIVER SURFACE<br>LIGHT OIL AT COFFEE AND PUGET ISLANDS, SHEEN AT WALLACE IS. | VISUAL SURVEY (BOAT) |
| 21 MAR 1330 | 571 | CROWN ZELLERBACK/HANBY<br>WAUNA MILL RM 42 WELCOME SLOUGH | | RIVER SURFACE & BEACHES<br>HEAVY CONCETRATION OF OIL IN SLOUGH | VISUAL SURVEY |
| 21 MAR 1300 | 572 | NIEMELA (LOCAL FISHERMAN)<br>JIM CROW POINT AREA | | RIVER BOTTOM<br>OILED GRASS AND OIL ON HOOKS HEAVY BLOBS IN RIVER | LONGLINE FISHING (40 HR. SET) |
| 20 MAR 0700 | 573 | ODFW/WARREN<br>TROJAN PLANT FISH POND | | FISH IN POND<br>NO PROBLEMS FOUND | FISH PATHOLOGY STUDIES |
| 11 APR 1000 | 574 | MOBILE CLEAN-UP CREW/EES<br>BETWEEN SEAVIEW AND LONGBEACH APPROACH | | STURGEON | PICKED UP BY HAND ON BEACH |
| 7 MAR 1100 | 575 | NMFS/ANTONELLIS<br>ASTORIA TO BONNEVILLE | | MARINE MAMMALS<br>REPORT UNAVAILABLE | VISUAL SURVEY (PLANE) |
| 21 MAR 1100 | 576 | NMFS/ANTONELLIS<br>ASTORIA TO BONNEVILLE | | MARINE MAMMALS<br>REPORT UNAVAILABLE | VISUAL SURVEY (PLANE) |

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|---|---|---|---|---|---|
| 27 MAR 1100 | 577 | NMFS/ANTONELLIS<br>ASTORIA TO BONNEVILLE | | MARINE MAMMALS<br>REPORT UNAVAILABLE | VISUAL SURVEY (PLANE) |
| 8 MAY 2000 | 578 | NOAA/KUMMERLOWE<br>COUNTY LINE PARK | A-129-1 | BEACH SURVEY<br>NO OIL SIGHTED | VISUAL SURVEY, SHOVEL |
| 8 MAY 0655 | 579 | NOAA/KUMMERLOWE<br>COUNTY LINE PARK | A-130-1 | BEACH SURVEY<br>NO OIL SIGHTED | VISUAL SURVEY , SHOVEL |
| 9 MAY 0710 | 580 | NOAA/KUMMERLOWE<br>CATHLAMET CITY MARINA | A-130-2 | VISUAL SURVEY<br>2 .5 CM TARBALLS SIGHTED | VISUAL SURVEY |
| 9 MAY 0715 | 581 | NOAA/KUMMERLOWE<br>SW TIP PUGET ISLAND<br>1 PICTURE TAKEN | A-130-3 | BEACH SURVEY - TRENCH<br>NO OIL SIGHTED | VISUAL SURVEY, SHOVEL |
| 9 MAY 0715 | 582 | NOAA/KUMMERLOWE<br>SE TIP OF PUGET ISLAND | A-130-4 | BEACH TARBALL<br>FOUND 1 TARBALL | JAR |
| 9 MAY 0720 | 583 | NOAA/KUMMERLOWE<br>SE TIP PUGET ISLAND (N. SIDE)<br>2 PHOTOS TAKEN | A-130-5 | BEACH TARBALL<br>TARBALL FOUND | JAR |
| 9 MAY 0845 | 584 | NOAA/KUMMERLOWE<br>SE TIP PUGET ISLAND<br>APPROX .5 - 2 CM AVERAGE SIZE, DO NOT FLOAT | A-130-6 | BEACH SURVEY<br>VERY LIGHT SCATTERING, WELL SORTED, TARBALLS, SAND-ACCRETED | VISUAL SURVEY |
| 9 MAY 0900 | 585 | NOAA/KUMMERLOWE<br>SE TIP (S. SIDE) PUGET ISLAND<br>SAND IS SOFT, 3 PHOTOS TAKEN, COLLECTED ONE BEACH TARBALL | A-130-7 | SAND<br>NO OIL ABOVE OR BELOW WATERLINE IN SAND | VISUAL SURVEY, SHOVEL |
| 9 MAY 0921 | 586 | NOAA/KUMMERLOWE<br>SE TIP TENESILLAHEE ISLAND<br>TARBALLS MOSTLY ASSOCIATED WITH HIGH-WATER DETRITUS | A-130-8 | BEACH SURVEY<br>SCATTERED, VERY LIGHT TARBALL COVERAGE, 3 PHOTOS TAKEN | VISUAL SURVEY, SHOVEL |
| 9 MAY 0955 | 587 | NOAA/KUMMERLOWE<br>BUOY #32 OFF SKAMKAM BEACH<br>6 1 MM TARBALLS PICKED UP, 1 PHOTO TAKEN | A-130-9 | WATER COLUMN<br>30 MINUTE DURATION 1 KT CURRENT | PLANKTON NET 5-10 FT OFF BOT. |
| 9 MAY 1000 | 588 | NOAA/KUMMERLOWE<br>BUOY #32 OFF SKAMKAM BEACH | A-130-10 | WATER COLUMN<br>NO OIL OBSERVED, 30 MINUTE DURATION | PLANKTON NET -5 FT. |
| 9 MAY | 589 | NOAA/KUMMERLOWE<br>SKAMKAM BEACH | A-130-11 | BEACH SURVEY, 200 FT<br>NO OIL OBSERVED | VISUAL SURVEY, SHOVEL |
| 9 MAY 1515 | 590 | NOAA/KUMMERLOWE<br>E. TIP OF SAND ISLAND | A-130-12 | BEACH SURVEY 300 YDS<br>NO OIL OBSERVED | VISUAL SURVEY, SHOVEL |
| 9 MAY 1550 | 591 | NOAA/KUMMERLOWE<br>W.NW TIP OF SAND ISLAND<br>COLLECTED REPRESENTATIVE SAMPLES | A-130-13 | BEACH SURVEY 200 YDS<br>WIDELY SCATTERED TARBALLS, HIGHLY WEATHERED | VISUAL SURVEY, SHOVEL |
| 9 MAY 1550 | 592 | NOAA/KUMMERLOWE<br>W.NW TIP SAND ISLAND<br>COLLECTED TARBALL ON BEACH 2 PHOTOS TAKEN | A-130-14 | BEACH SURVEY 1/2 MILE<br>WIDELY SCATTERED TARBALLS, MUCASOID SHEEN IN MARSH | VISUAL SURVEY, JAR |
| 9 MAY 1550 | 593 | NOAA/KUMMERLOWE<br>W.NW TIP SAND ISLAND<br>2 PHOTOS TAKEN | A-130-15 | BEACH/MARSH SURVEY<br>COLLECTED ONE TARBALL MAT, FOUND IN MARSH AREA | VISUAL SURVEY, JAR |
| 9 MAY 1700 | 594 | NOAA/KUMMERLOWE<br>BEACH N OF CAPE D. FT CANBY STATE PARK | A-130-16 | BEACH SURVEY 50 YDS<br>EXTREMELY FEW SMALL TARBALLS | VISUAL SURVEY |

NOAA/HAZMAT SAMPLE TRACKING FOR THE MOBILOIL SPILL (BY SEQ. #) HSTR07
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|---|---|---|---|---|---|
| 9 MAY 1800 | 595 | NOAA/KUMMERLOWE<br>GRAY'S BAY, SE CORNER NEAR ALTOOVER<br>OIL ON VEGETATION, NO SMELL OF OIL | A-130-17 | BEACH GRASSES<br>NO NEW OILING, OLD WEATHERED OIL, HIGHLY SCATTERED | VISUAL SURVEY |
| 9 MAY 2100 | 596 | HAGEDORN<br>ELOCHOMAN RIVER (3/25/84)<br>RECEIVED FROM LEW KITTLE | A-130-18 | STURGEON<br>1 SAMPLE OF STURGEON GILLS, NARES & LIVER IN BOTTLE | BOTTLE |
| 9 MAY 2100 | 597 | WDF/JONES<br>COLUMBIA RIVER, RMILE 124, CORBETT AREA<br>LENGTHS 92,97,98,62 C, RESPECTIVELY | A-130-19 | WHITE STURGEON, 4<br>RECEIVED 4 SAMPLES OF GILLS FROM LEW KITTLE. W-4-2-1, 2,3,4 | GILLNET |
| 9 MAY 2100 | 598 | WDF/JONES<br>COLUMBIA RIVER RMILE 31-34, SKAMKAM AREA<br>LENGTHS 97,85,82,72 CM RESPECTIVELY | A-130-20 | WHITE STURGEONS<br>RECEIVED 4 SAMPLES OF GILLS FROM LEW KITTLE, W-3-24-1,2,3,4 | GILLNET |

# APPENDIX D

## SELECTED SPECIES

Selected species found downstream of the spill site and in the estuary.

SHELLFISH

- Dungeness crab
- Razor clam
- Sand shrimp
- Blacktail shrimp
- Freshwater crayfish
- Pacific oyster

FISH

- Chinook salmon
- Coho salmon
- Chum salmon
- Sockeye salmon
- Steelhead trout
- Cutthroat trout
- Mountain whitefish
- Columbia River smelt
- Whitebait smelt
- Longfin smelt
- Surf smelt
- Green sturgeon
- White sturgeon
- Starry flounder
- English sole
- Petrale sole
- Striped bass
- Pacific sandlance
- American shad
- Pacific herring
- Redtail surfperch
- Northern anchovy
- Pacific hake
- Pacific tomcod
- Lingcod
- Black rockfish

BIRDS

- Common merganser
- Red-breasted merganser
- Canada goose
- Mallard
- Pintail
- Greater scaup
- Barrow's goldeneye
- Surf scoter
- White-winged scoter
- American coot
- Pigeon guillemot

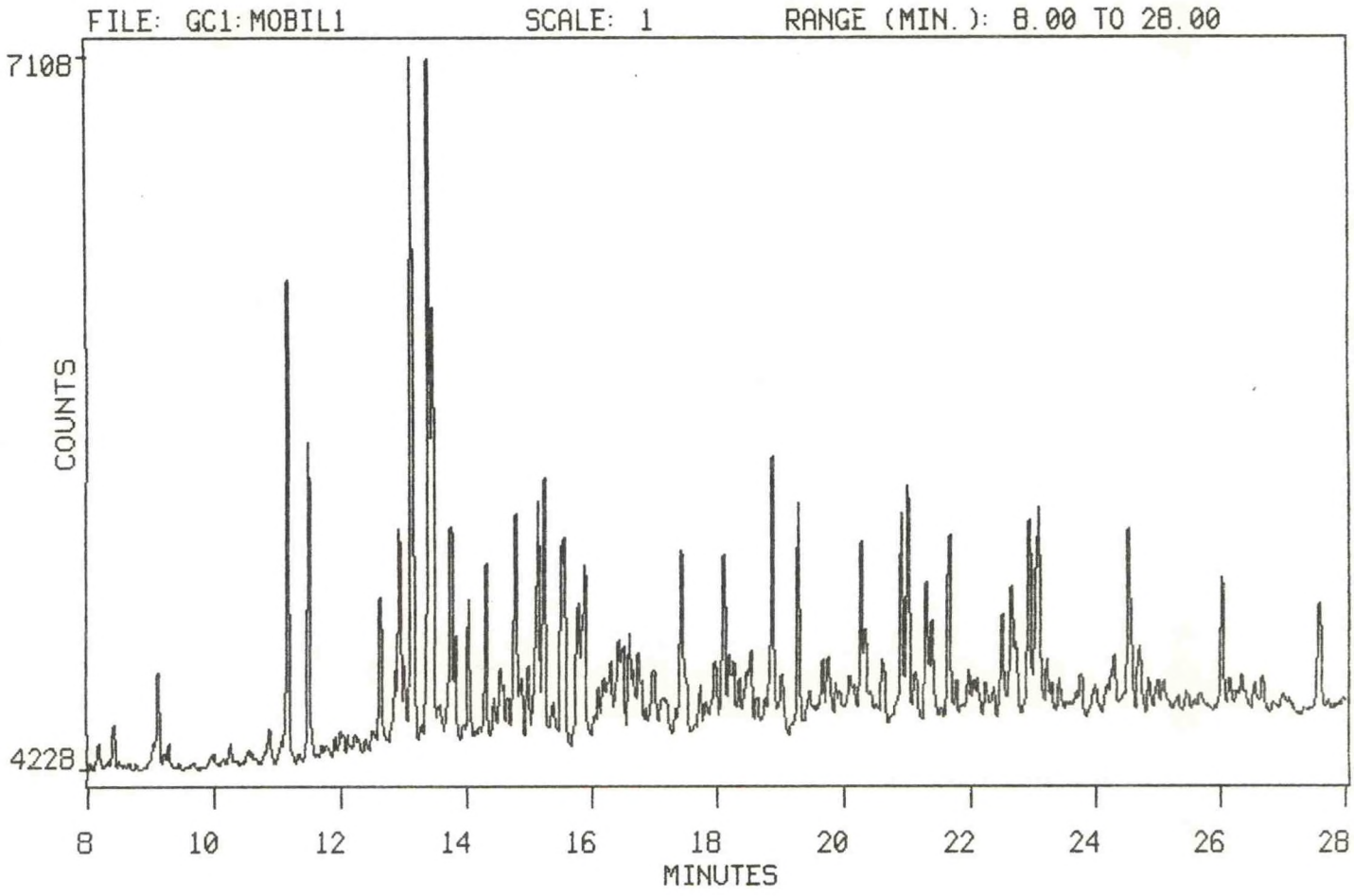
MAMMALS

- Harbor seal
- Beaver
- Muskrat

# APPENDIX E

## SAMPLE CHROMATOGRAMS

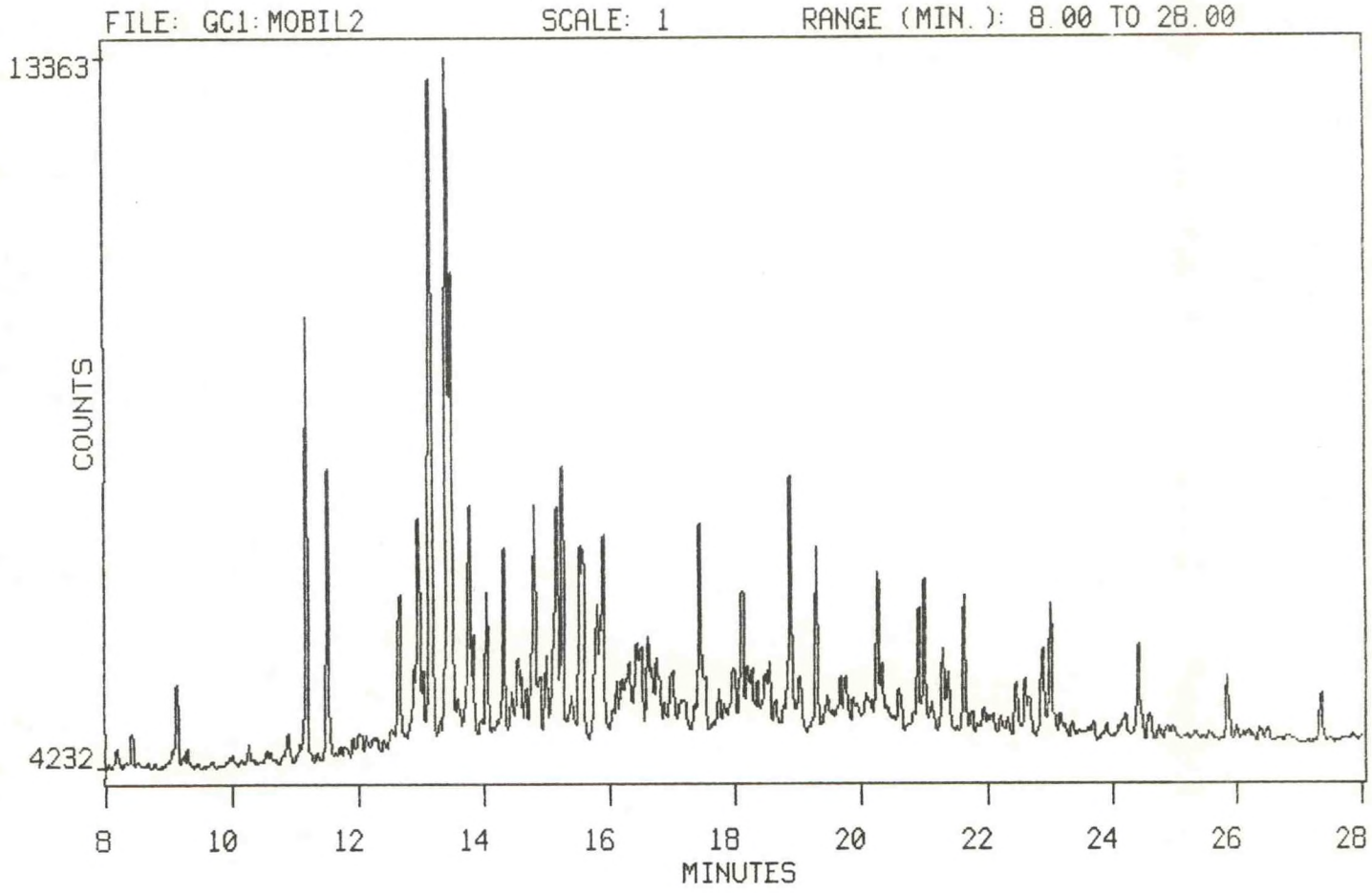
RECONSTRUCT SCREEN DUMP  Time:07:43:33  Date:TUE 24 APR 84
Data Acquisition  Time:12:11:41  Date:TUE 10 APR 84
Method:COLUMBIA3




SAMPLE #1. MOBILOIL Tank #4

RECONSTRUCT SCREEN DUMP
Data Acquisition

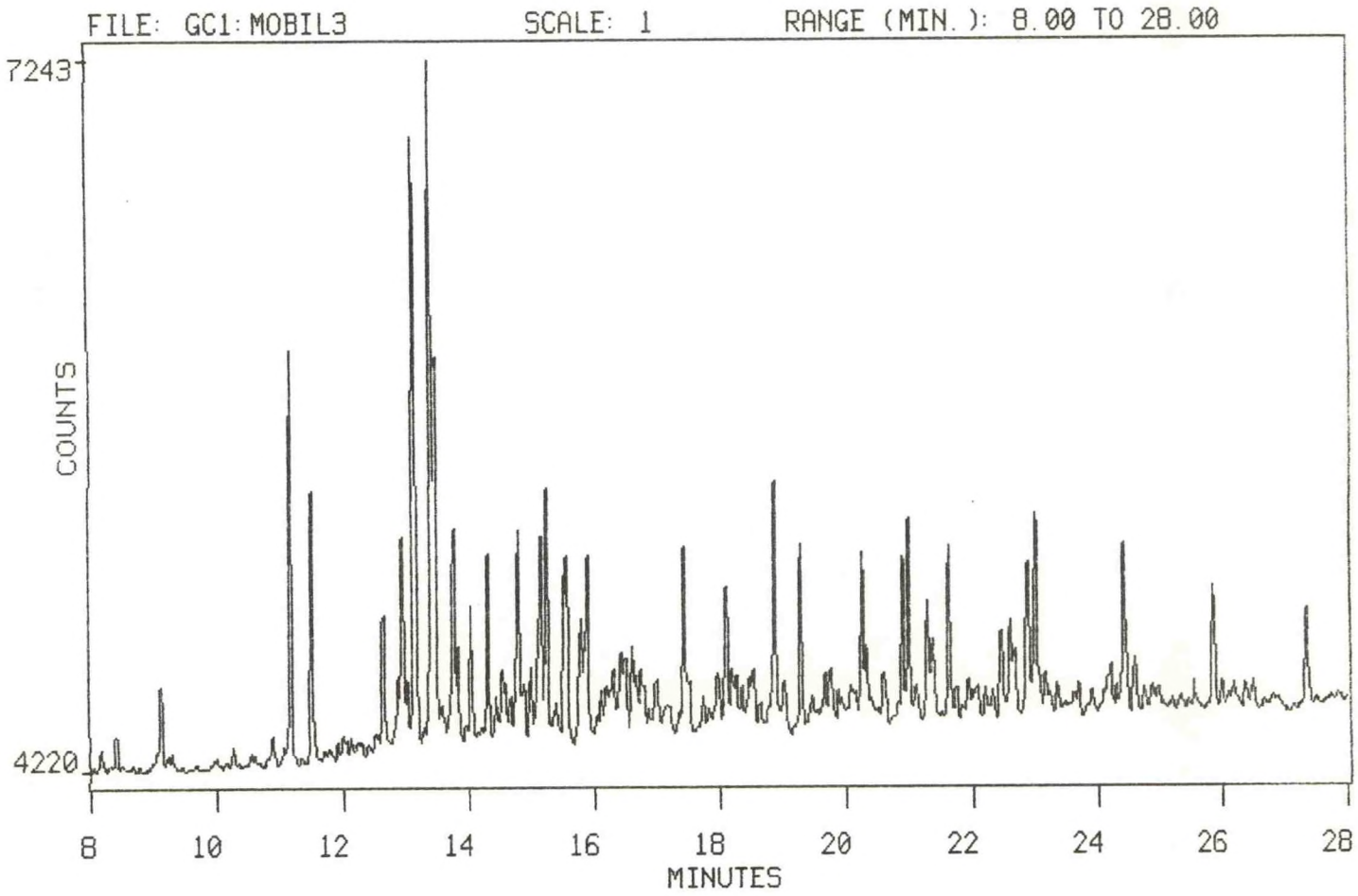
Time:07:46:24 Date:TUE 24 APR 84
Time:13:16:56 Date:TUE 10 APR 84
Method:COLUMBIA3



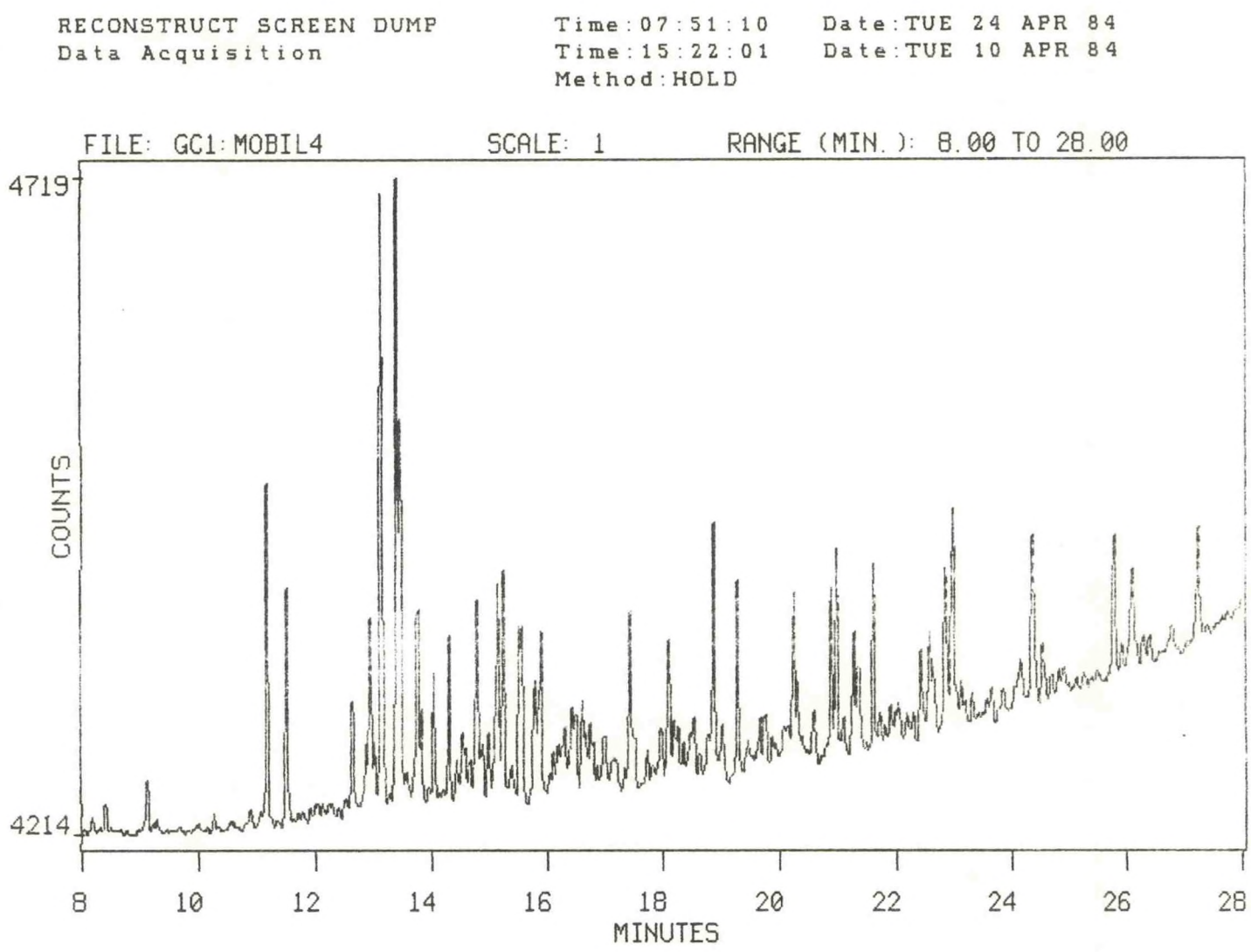

SAMPLE # 2. MOBILOIL Tank #3

RECONSTRUCT SCREEN DUMP
Data Acquisition

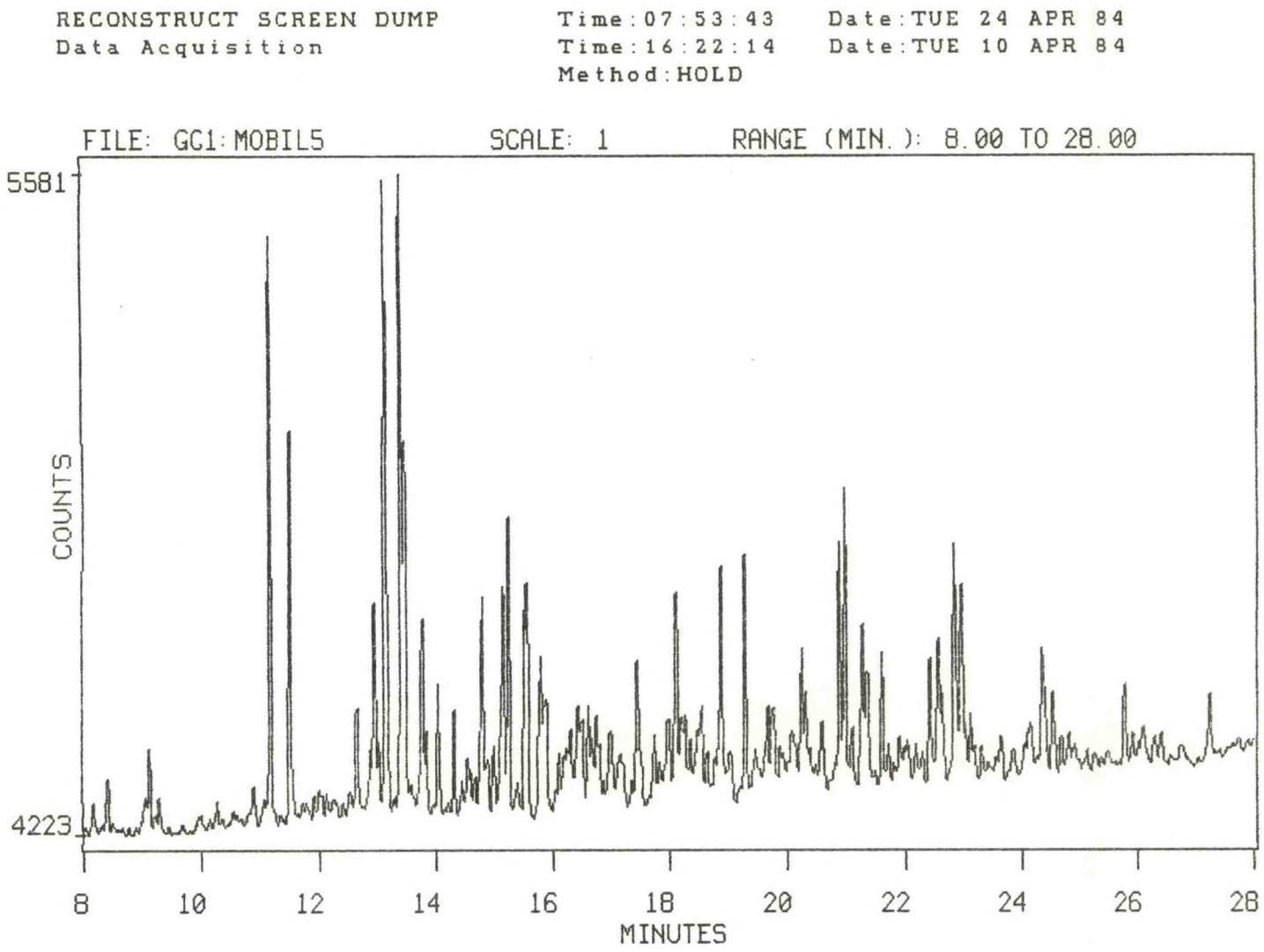
Time:07:48:44 Date:TUE 24 APR 84
Time:14:20:00 Date:TUE 10 APR 84
Method:COLUMBIA2




SAMPLE # 3. MOBILOIL Tank #1



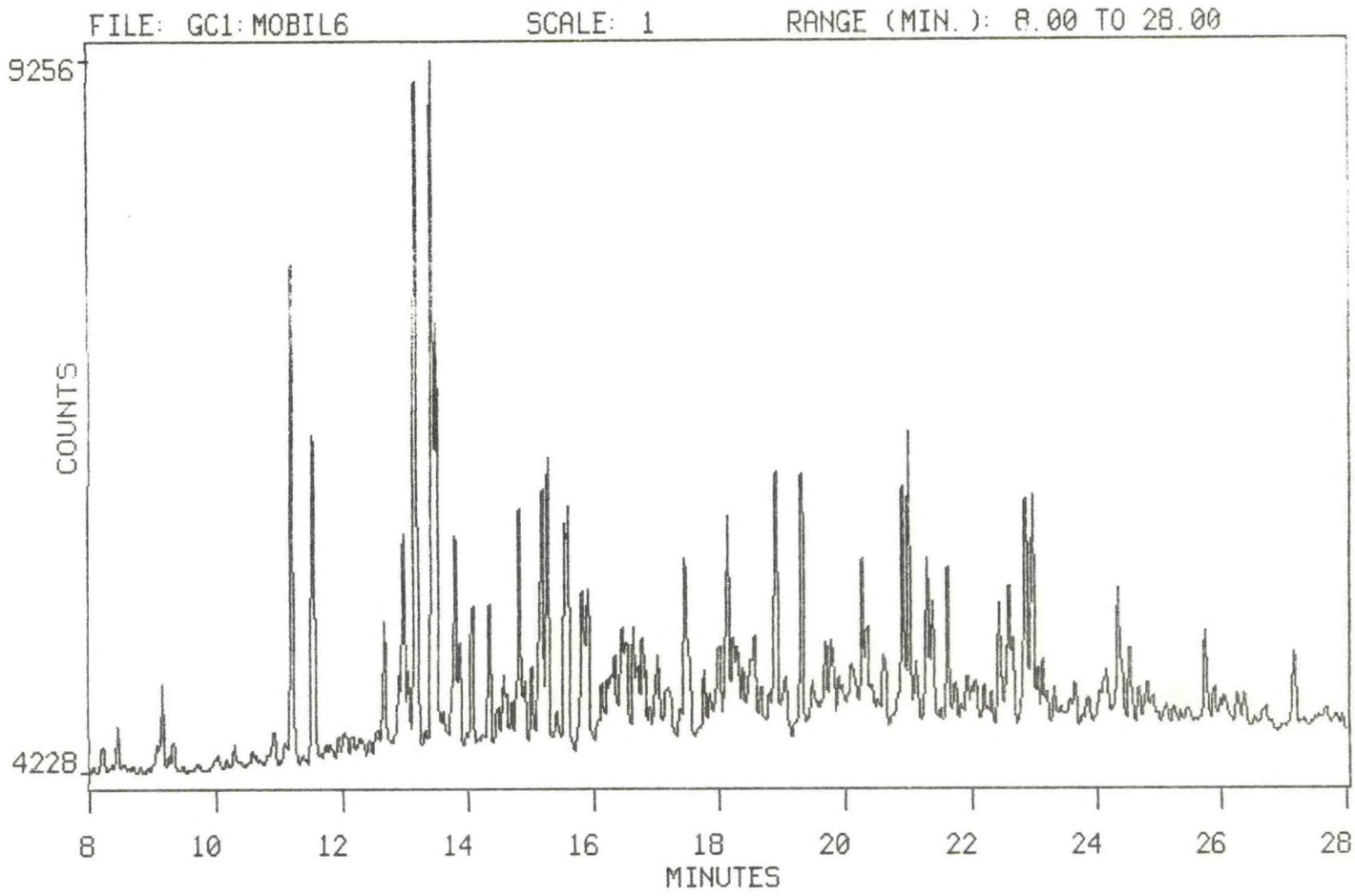

SAMPLE #4. Outer Beach Oil




SAMPLE #5. Oily Sand Downriver of Spill

RECONSTRUCT SCREEN DUMP
Data Acquisition

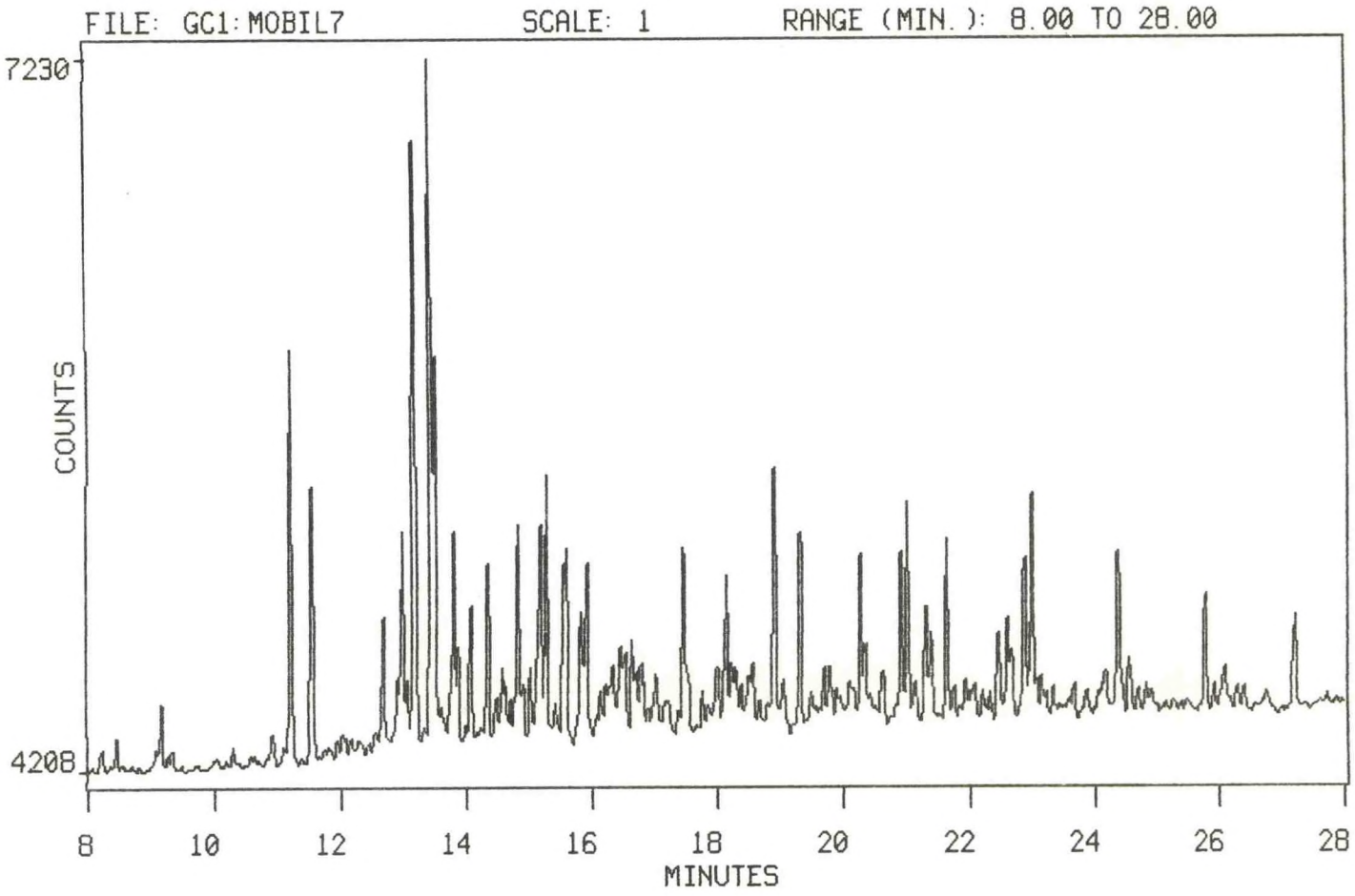
Time:07:56:22 Date:TUE 24 APR 84
Time:08:49:56 Date:WED 11 APR 84
Method:HOLD



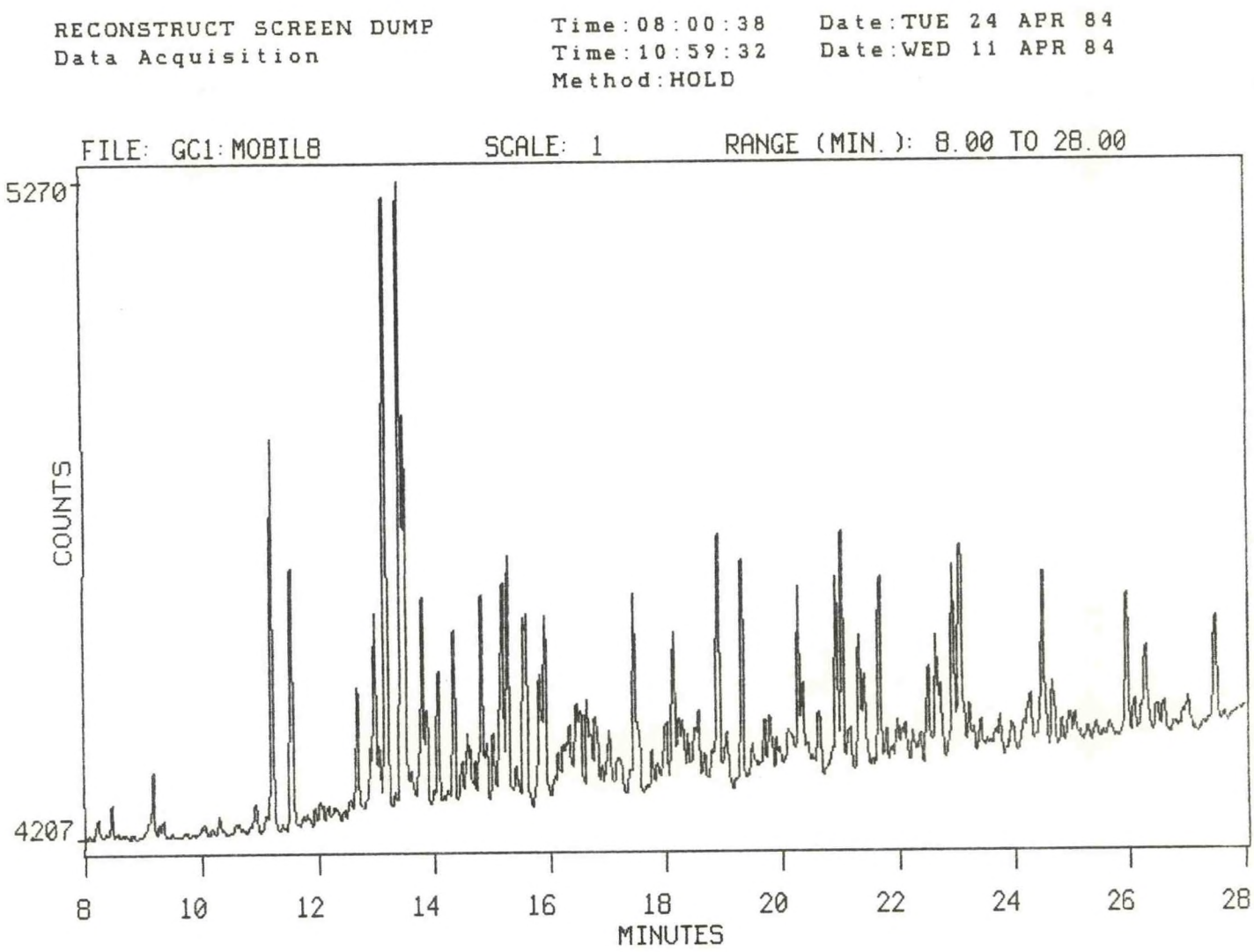

SAMPLE #6. Oil Below Ship

RECONSTRUCT SCREEN DUMP
Data Acquisition

Time:07:58:31 Date:TUE 24 APR 84
Time:09:57:44 Date:WED 11 APR 84
Method:HOLD



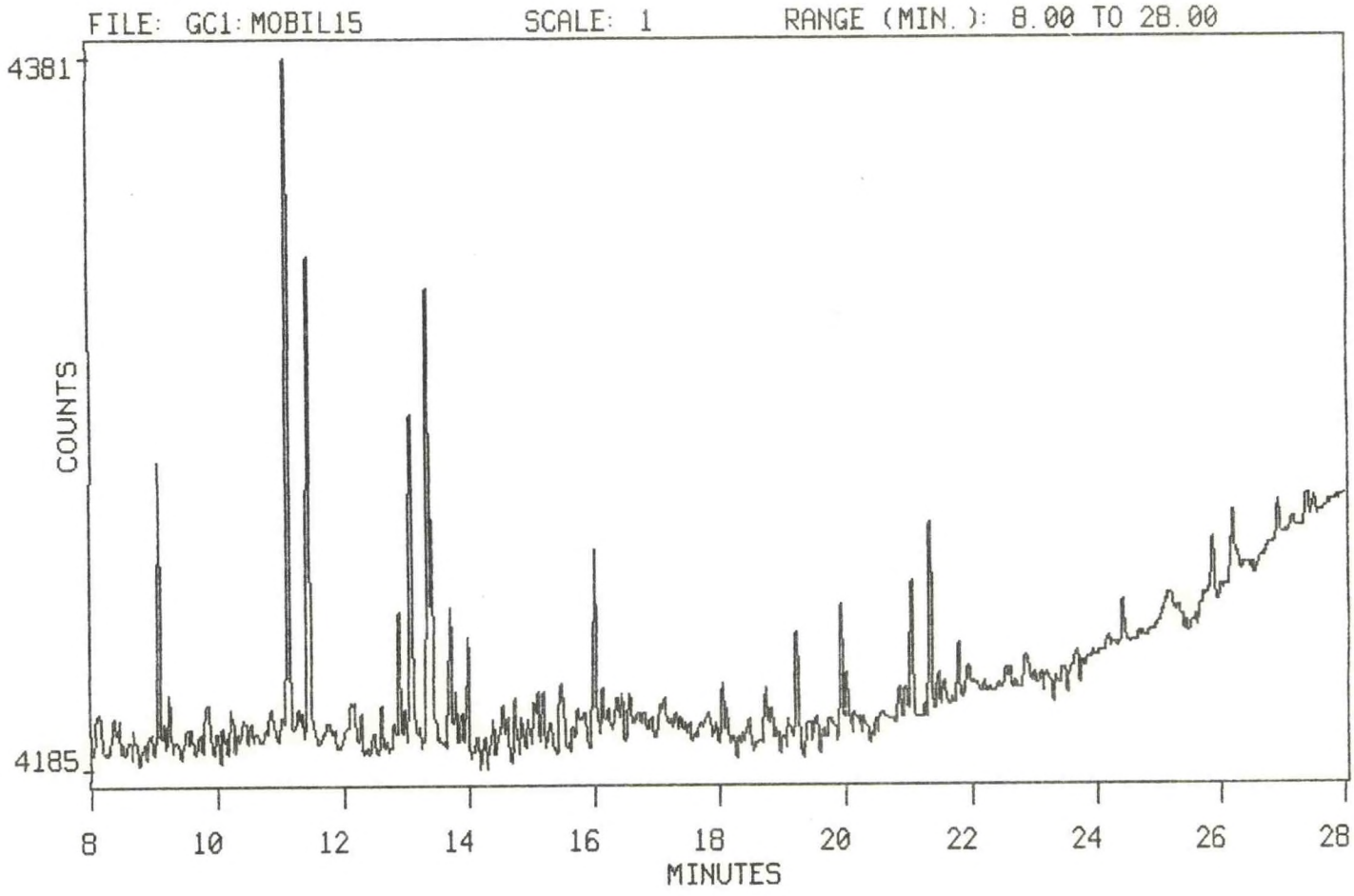

SAMPLE #7. Oil from Jim Crow Sands.



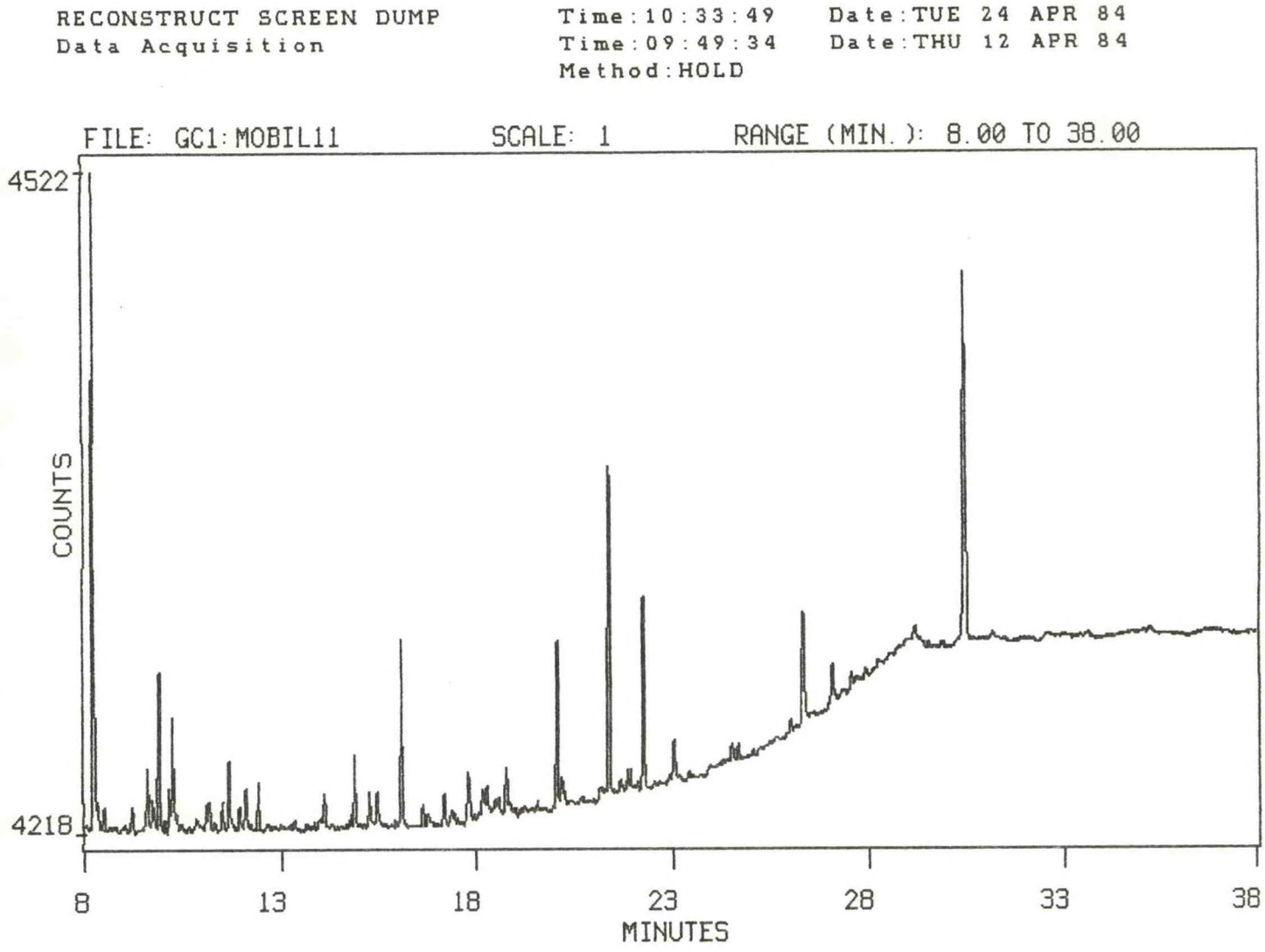

SAMPLE #8. Outer Beach Tarball

RECONSTRUCT SCREEN DUMP
Data Acquisition

Time:08:03:04 Date:TUE 24 APR 84
Time:08:56:55 Date:WED 18 APR 84
Method:COLUMBIA



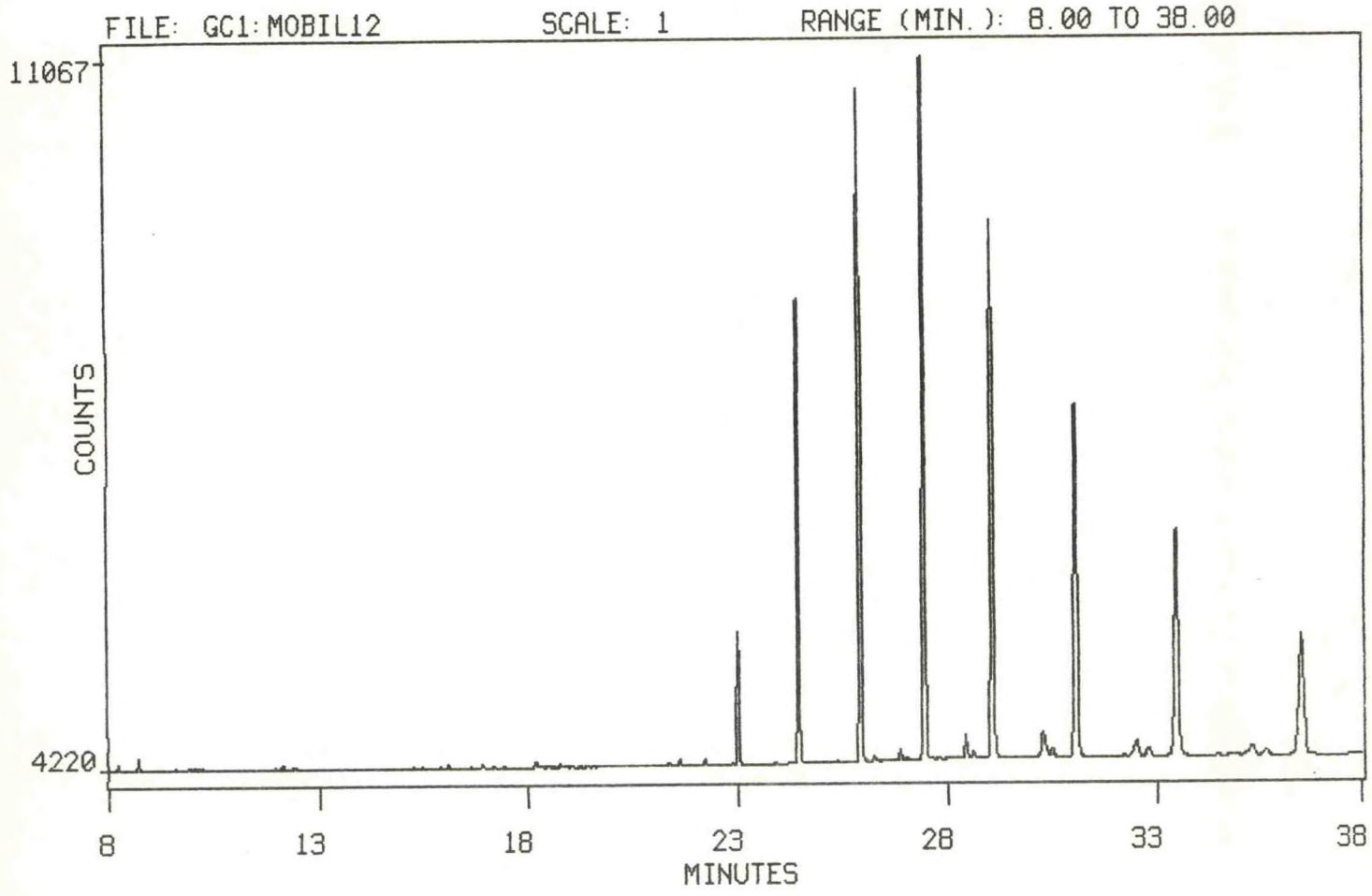

SAMPLE #9. Water-solubles




SAMPLE #10. Water in Elochoman Slough

RECONSTRUCT SCREEN DUMP
Data Acquisition

Time:10:31:32 Date:TUE 24 APR 84
Time:10:52:48 Date:THU 12 APR 84
Method:HOLD




SAMPLE #11. Water near Elochoman Slough

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