St. Paul Island Operable Unit

Completion of Two-Party Agreement Activities

Volume 2

National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Islands Environmental Restoration Project

August 2008

U.S. DEPARTMENT OF COMMERCE
Carlos M. Guttierrez, Secretary

National Oceanic and Atmospheric Administration
Vice Admiral Conrad C. Lautenbacher, Jr., U.S. Navy (Ret.),
Under Secretary for Oceans and Atmosphere

National Ocean Service
John H. Dunnigan, Assistant Administrator
for Ocean Services and Coastal Zone Management

Citiation
Lindsay, John A. 2008. *St. Paul Island Operable Unit: Completion of Two-Party Agreement Activities, Volume 2*. Prepared by the National Oceanic and Atmospheric Administration, Pribilof Islands Environmental Restoration Project Office. Seattle, WA: Government Printing Office.

Table of Contents

Available in Volume 1

Letter from John Lindsay to Jennifer Roberts RE: Closure of the St. Paul Island, Alaska Operable Unit. Dated June 4, 2008 v

Table 1 - Summary of NOAA Sites on St. Paul Island, Alaska, Revised: April 30, 2008 ix

Appendix I

Appendix I to the June 4, 2008 Request for Closure of the St. Paul Island, Alaska, Operable Unit under the Two-Party Agreement between the Alaska Department of Environmental Conservation and the National Oceanic and Atmospheric Administration Signed January 1996 3

Site Closure Documents 1–35 5

Available in Volume 2

Site Closure Documents 36–60 811

Appendix II

Appendix II to the June 4, 2008 Request for Closure of The St. Paul Island, Alaska, Operable Unit under the Two-Party Agreement between The Alaska Department of Environmental Conservation and the National Oceanic And Atmospheric Administration Signed January 1996 1403

Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska 1405

Letter from Jennifer Roberts to John Lindsay RE: Draft Final Groundwater Use and Classification in the Vicinity of Tract 46 TPA 9 St. Paul Island April 30, 2002 Contract No. 50-SPNA-9-00009 Task Order 56-S-NA-90003. Dated May 30, 2002. 1473

Long Term Groundwater Monitoring Plan, St. Paul Island, Alaska 1477

Letter from Louis Howard to John Lindsay RE: Draft Long Term Monitoring Plan St. Paul Island Alaska June 30, 2005. Dated August 8, 2005 1503

Memoranda from ADNR, Gary J. Prokosch and Michael L. Menge, RE: CWMA St. Paul Island. Dated April 2006 1505

St. Paul Island Residual Contamination Report 1513

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office
7600 Sand Point Way N.E.
Seattle, Washington 98115

June 4, 2008

Jennifer Roberts
Federal Facilities Program Manager
Alaska Department of Environmental Conservation
Division of Spill Prevention and Response
Contaminated Sites Program
555 Cordova Street
Anchorage, AK 99501-2617

Subject: Closure of the St. Paul Island, Alaska Operable Unit.

Dear Ms. Roberts:

In accordance with paragraph 59 of the Pribilof Islands Environmental Restoration Agreement (Two-Party Agreement or TPA) January 1996 by designated officials of the State of Alaska and the National Oceanic and Atmospheric Administration (NOAA), NOAA requests Alaska Department of Environmental Conservation (ADEC), as the duly authorized representative of the State of Alaska, certification of NOAA's completion of corrective action for the St. Paul Island Operable Unit (OU).

NOAA and the ADEC identified a total of sixty (60) sites at St. Paul Island (Table 1). This number (60) exceeded the number (15) of source areas identified in the TPA (Attachment A, St. Paul Island) due to agreed upon changes in the manner of site designation and the discovery of new sites during various phases of site investigation. Site 1 listed in TPA Attachment A and Table 1, and Sites 48 and 56 (Table 1), Windmill Wells and ATCO/Radio Building Barrel Storage Area, respectively, were subsequently recognized as formerly used defense sites (FUDS) in accordance with Public Law 106-562 legislated in 2000. While NOAA had conducted soil and groundwater assessments at these sites, PL106-562 precluded NOAA from undertaking any corrective action. Also, Site 57, Tract 46 Sheet Metal Garage (Table 1), did not include any hazardous materials, and general building demolition does not fall under the purview of ADEC regulations applicable to NOAA environmental restoration activities on the Pribilof Islands (TPA paragraph 2). Consequently, NOAA did not request a conditional closure or a no further action determination from ADEC for Sites 1, 48, 56, or 57. Appendix I contains copies of closure documents appropriate to each site in accordance with TPA paragraphs 42-47. Appendix II includes copies of NOAA's long-term groundwater monitoring plan approved by ADEC in 2005. NOAA considers groundwater and surface water corrective actions complete per TPA paragraph 59 with ADEC's approval of the plan and NOAA's on-going compliance with the plan.

NOAA asserts that it has completed in accordance with the TPA all investigations and corrective actions approved by ADEC, to the extent practicable by:

- removing drums and debris,
- removing underground storage tanks (USTs) and above ground storage tanks (ASTs),
- removing fuel pipelines,
- removing contaminated soil,
- closing solid waste sites, and
- characterizing and monitoring groundwater
-

Table 1 summarizes specific environmental quality parameters at each site. Parameters in Table 1 include type of contamination (drums, surface debris and solid wastes), media contaminated (soil, surface water, and groundwater), presence or absence of residual contamination with succinct comments regarding land use (a.k.a. institutional) controls, as appropriate, the date ADEC signed its conditional closure or a no further remedial action planned (NFRAP) determination, as appropriate, per TPA paragraph 59, and the current property owner.

Appendix I also includes copies of deed notices recorded with the Alaska Recorder's Office, Aleutian District for ten sites where contamination and or buried debris remains in-situ. In addition, notice of residual contamination or buried solid waste will be identified in quitclaim deeds NOAA is drafting as it continues to transfer real property to St. Paul Island entities in accordance with the Transfer of Property Agreement signed by NOAA and various Pribilof Islands' entities in 1984.

Appendix II includes copies of the following and related documents: a St. Paul Village groundwater use and classification study; the long-term groundwater monitoring plan; ADEC's acceptance of the groundwater use and classification study and NOAA's request to apply the ten times rule; the ADNR critical water management area determination; and a summary of in-situ residual soil and groundwater contamination.

In addition to the attached documentation and pursuant to TPA paragraph 57, NOAA maintains an administrative record (AR) for the St. Paul Island OU at the following four locations: St. Paul Island Tribal Government Center; Alaska Resources Library and Information Services, Anchorage, AK; NOAA Sand Point, Seattle, WA; and the National Archives and Records Administration, Seattle, WA. Currently, the AR is complete through calendar 2007. Calendar year 2008 documents will be added to the AR by the end of January 2009.

Per this submission, including Appendices I and II, NOAA requests ADEC concurrence that all corrective actions pursuant to the TPA between ADEC and NOAA signed in 1996 for the St. Paul Island Operable Unit are complete. Enclosed are two copies of a signature page attesting no further remedial action is planned ("conditional closure status") for the St. Paul Island Operable Unit. I have signed both copies as NOAA's project manager pursuant to TPA paragraph 42.

If you concur, please sign both copies on behalf of ADEC, returning one signed copy to me and retaining the other copy for ADEC's records.

If you have any questions, please do not hesitate to contact me either in writing, or at (206) 526-4560.

Sincerely,

John A. Lindsay, Manager
Pribilof Islands Environmental Restoration Project Office

Appendices: I and II

cc: St. Paul RAB Members (DVD only)
David Kennedy, Pribilof Program Director
William Broglie, NOAA OCAO
James Barrows, NOAA CAO
Nancy Briscoe, NOAA GCNR
Craig O'Connor, NOAA GCNR
Robert Taylor, NOAA GC

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office
7600 Sand Point Way N.E.
Seattle, Washington 98115

For the National Oceanic and Atmospheric Administration

John A. Lindsay
NOAA, Manager, Pribilof Islands Environmental Restoration Project Office

June 4, 2008
Date

Approvals:

In accordance with Paragraph 59 of the Two Party Agreement (TPA), my signature confirms that all corrective action has been completed to the maximum extent practicable for all environmental media at NOAA's TPA and Non-TPA sites comprising the St. Paul Island Operable Unit, in accordance with the Agreement and that no further remedial action is required as a part of this conditional closure granted by ADEC.

For the Alaska Department of Environmental Conservation

Jennifer Roberts
Alaska Department of Environmental Conservation
Federal Facilities Program Manager

June 4 2008
Date

Table 1 – Summary of NOAA Sites on St. Paul Island, Alaska. June 4, 2008

			Type of Contamination								
NOAA Site No.	**TPA Site No.**	**Site Name**	**Drums**	**Surface Debris**	**Solid Waste**	**Soil**	**Sediment**	**Surface Water**	**Building Demolition**	**UST/AST/ Pipeline**	**Clean Closure**
1	1	Oil Drum Dump	X	X	X	X					
2	2	Vehicle Boneyard	X	X	X						
3	3	Little Polovina Boneyard		X							X
4	4	Dune Vehicle Boneyard		X							X
5	5a	St. Paul Landfill (active Cell C)	X		X	X					
6	5b	Cell A	X		X	X					
7	5c	Cell B drum dump	X			X					
8	5d	Cell B solid waste			X						X
9	6	Pumphouse Lake		X							X
10	7a	NMFS Fuel Barge: North End Lagoon		X		X					X
11	7b	NMFS Fuel Barge: Lagoon Channel		X							X
12	7c	NMFS Fuel Barge: Black Bluff		X							X
13	7d	NMFS Fuel Barge: East Landing		X							X
14	8a	NOAA (NMFS) Reef Point Landfill		X							X
15	8b	NOAA (Village) Landfill		X	X	X					
16	9a	Old Movie Theater								X	X
17	9b	Former Power Plant (Former Post Office)				X				X	
18	9c	Decommissioned Power Plant				X			X	X	
19	9d	Decommissioned Power Plant Annex				X			X	X	
20	9e	Municipal Garage/Machine Shop (a.k.a. Municipal Garage UST vent fill/pipe TPA 9c, and Municipal Garage Drum Staging Area (Tract 41) 9d per TPA Attachment A)				X			X	X	
21	9f	Old Coal Shed (Cascade Bldg)				X				X	
22	9g	Former Fouke Bunkhouse				X				X	X
23	9h	Former Alaska Dormitory				X				X	
24	9i	E-Shop/Radio Building and Duplex				X				X	
25	9j	5 Car Garage and Anderson Bldg				X				X	X
26	9k	AST Saddle Complex				X				X	
27	9l	Old Sealing Plant (a.k.a. Barreling Shed)				X			X		X
28	9m	Salt Water Wells (a.k.a. Contaminated Salt Water Wells, TPA 9e; TPA Attachment A)							X		X
29	10	Former Gasoline Tank Farm								X	X

			Type of Contamination								
NOAA Site No.	**TPA Site No.**	**Site Name**	**Drums**	**Surface Debris**	**Solid Waste**	**Soil**	**Sediment**	**Surface Water**	**Building Demolition**	**UST/AST/ Pipeline**	**Clean Closure**
30	11	Diesel Tank Farm				X				X	
31	12a	Lukanin Bay Debris Area A	X	X	X						X
32	12b	Lukanin Bay Debris Area B			X						X
33	12c	Lukanin Bay petroleum contaminated soil			X	X					X
34	13a	Salt Lagoon Diesel Seep (uplands)	X			X				X	
35	13b	Salt Lagoon D. Seep Channel				X	X	X			X
36	14	Icehouse Lake (a.k.a. Icehouse Lake Buried Vehicle Bone-yard; TPA Attachment A)	X	X	X	X				X	
37	15a	Scoria Pit – Telegraph Hill	X	X							X
38	15b	Scoria Pit – Lake Hill	X	X	X						X
39	15c	Scoria Pit – Ridge Wall	X	X							X
40	NTPA	Aleut Bunkhouse		X							X
41	NTPA	Bulldozer in Bog		X							X
42	NTPA	Explosives Storage Bunker									X
43	NTPA	Barrels at North End of Salt Lagoon	X	X		X					X
44	NTPA	Big Polovina Debris		X							X
45	NTPA	SW Point Former LORAN		X		X					X
46	NTPA	Blubber Dump Debris		X	X						X
47	NTPA	Petroleum Contaminated Stockpile (Blubber Dump PCS removal and Polovina Hill Stockpile)				X					X
48	NTPA	Windmill Wells									X
49	9n	Gas Station and Garage				X				X	X
50	9o	Former Gasoline/Diesel Drum Storage Area	X			X				X	
51	9p	Fuel Transfer Station and Pipeline (Receiving Warehouse)				X				X	
52	NTPA	Tract 50 asbestos in soil		X							X
53	9q	Tract A Lot 101				X				X	
54	9r	Tract A Lot 102				X				X	
55	9s	Tract A Lot 103				X				X	X
56	NTPA	ATCO/Radio Bldg Barrel Staging Area		X		X				X	
57	NTPA	Tract 46 Sheet Metal Garage							X		X
58	NTPA	Tract 50 Foundation DRO Combine Shop UST	X			X				X	
59	NTPA	Big Polovina Debris Stockpile		X							X
60	NTPA	Lead Contaminated Soils				X					

NOAA Site No.	TPA Site No.	Site Name	Site Conditions as of June 4, 2007	Within CWMA[1]	Site Status as of April 2, 2008	Property Owner as of November 6, 2007
1	1	Oil Drum Dump	DRO and RRO exceed Method Two levels in an estimated 2,300 cubic yards of soil. Groundwater contaminated with DRO. Buried debris exists, but extent and quantity is unknown.		FUDS	TDX/TAC
2	2	Vehicle Boneyard	Buried solid wastes, such as metallic debris and an asbestos monofill capped by vegetated soil cover; post-closure cap monitoring until June 20, 2010; deed notice.		NFRAP 06/20/05	TDX/TAC
3	3	Little Polovina Boneyard			NFRAP 03/03/00	TDX/TAC
4	4	Dune Vehicle Boneyard			NFRAP 02/20/01	TDX/TAC
5	5a	St. Paul Landfill (active Cell C)	Municipal solid waste (MSW), lead-based paint abatement waste (including building renovation waste), demolition debris, and lead soil from other sites consolidated at this location; vegetated cap; cap consists of petroleum-contaminated soil; post-closure cap monitoring until January 24, 2013; groundwater monitoring (potential DRO and lead contamination) until spring 2013 pending regulatory review; deed notice.		NFRAP 10/04/05 Solid Waste Closure 10/27/05 Reopened by NOAA in September 2006 to dispose of abatement and demolition wastes; re-closure approved by ADEC Solid Waste on 01/24/08.	NOAA
6	5b	Cell A	Residual soil DRO or RRO contamination remains in at least one limited area among construction and demolition debris. All buried debris and MSW has been capped with a minimum of two feet of clean scoria; the cap side walls are vegetated; post-closure cap monitoring until November 2010 pending regulatory review; deed notice.		NFRAP 11/15/04	City of St. Paul/TAC
7	5c	Cell B drum dump	Residual soil contaminated with DRO and RRO remains beneath City of St. Paul working pad circa 25 ft bgs; long-term groundwater monitoring at least until spring 2013 as part of the Cell C monitoring effort; deed notice.		NFRAP 04/11/05	City of St. Paul/TAC
8	5d	Cell B solid waste			NFRAP 02/11/05	City of St. Paul/TAC
9	6	Pumphouse Lake			NFRAP 04/11/01	TDX/TAC
10	7a	NMFS Fuel Barge: North End Lagoon			NFRAP 01/02/02	TDX/TAC
11	7b	NMFS Fuel Barge: Lagoon Channel			NFRAP 01/02/02	TDX/TAC
12	7c	NMFS Fuel Barge: Black Bluff			NFRAP 01/02/02	TDX/TAC
13	7d	NMFS Fuel Barge: East Landing			NFRAP 01/02/02	TDX/TAC

NOAA Site No.	TPA Site No.	Site Name	Site Conditions as of June 4, 2007	Within CWMA[1]	Site Status as of April 2, 2008	Property Owner as of November 6, 2007
14	8a	NOAA (NMFS) Reef Point Landfill	TPA Figure 4-2 depicts a "landfill" along the northern shoreline of Reef Point; the "landfill" site was purportedly used two or three times to burn wood debris, and the ash was buried at the site. Tetra Tech (December 2000) identified other disposal locations and removed debris at Reef Point. Nortech (2001) surveyed the area removed some surface debris.		NFRAP 12/19/01	NOAA (Seal Rookery)
15	8b	NOAA (Village) Landfill	De minimis quantities (<1 yd^3) of residual lead contaminated soil lies within basaltic rock fractures, and buried solid waste remains on a vegetated steep slope; deed notice.		NFRAP 12/19/01	TDX
16	9a	Old Movie Theater			NFRAP 10/11/04	TDX/TAC
17	9b	Former Power Plant (Former Post Office)	Residual soil contaminated with DRO remains beyond practical excavation limits and underneath the concrete slab that extends northerly beyond the north end of the former post office building; DRO exceeds the 10x Rule criterion at one location by the building foundation; long term groundwater monitoring (DRO contamination). (Note: Tribal Government installed a UST at Former Post Office in 1972; decommissioning of this UST is outside NOAA's authorization and the Two-Party Agreement); deed notice.	XX	NFRAP 10/11/04	Tribal Government/ TAC
18	9c	Decommissioned Power Plant	Residual soil contaminated with DRO and GRO remains greater than 15 feet bgs and under the roadway; long term groundwater monitoring (DRO contamination); benzene does not exceed 1991 criterion of 0.5 mg/kg, but it does exceed the current criterion of 0.02 mg/kg; deed notice.	XX	NFRAP 02/11/05	NOAA
19	9d	Decommissioned Power Plant Annex	Residual soil contaminated with DRO remains on north side of the Annex; GRO and DRO remain on the eastside of the Annex along buried utilities and potentially below the concrete pad; east side soils exceed CWMA criterion in limited areas. Residual soil benzene remains along buried utilities; benzene does not exceed 1991 criterion of 0.5 mg/kg; long term groundwater monitoring (DRO contamination); deed notice.	XX	NFRAP 09/14/04 NFRAP 04/08/08	NOAA
20	9e	Municipal Garage/ Machine Shop (a.k.a. Municipal Garage UST vent fill/pipe TPA 9c, and Municipal Garage Drum Staging Area (Tract 41) 9d per TPA Attachment A)	No contamination is known to exist under the Machine Shop. However, soil contamination at the water table remains below the former Municipal Garage which was demolished during 2007. Residual soil contaminated with DRO, GRO, benzene, toluene, and ethyl benzene, remain along utilities, beneath the roadway, and underneath a concrete pad tied to the Machine Shop; total xylenes above Method Two in soil remain in limited areas at the water table; DRO, GRO, toluene, and ethyl benzene in soils at the water table exceed the 10x Rule criteria in some areas; benzene exceeds the 1991 benzene criterion of 0.5 mg/kg in some areas; long term groundwater monitoring (DRO, GRO, toluene, and benzene contamination); deed notice.	XX	NFRAP 10/11/04 NFRAP 04/16/08	NOAA

NOAA Site No.	TPA Site No.	Site Name	Site Conditions as of June 4, 2007	Within CWMA[1]	Site Status as of April 2, 2008	Property Owner as of November 6, 2007
21	9f	Old Coal Shed (Cascade Bldg)	This site is contiguous with a former gasoline station. Residual soil contaminated with DRO, GRO, benzene, toluene, and ethylbenzene remain along utilities, in the water table, and beneath the roadway; total xylenes remain in limited areas at the water table; DRO, GRO, toluene, and ethylbenzene in soils at the water table exceed the 10x Rule criteria in most areas; benzene exceeds the 1991 benzene criterion of 0.5 mg/kg in most areas; long term groundwater monitoring (DRO, GRO, benzene, and ethylbenzene contamination); deed notice.	XX	NFRAP 04/01/05	NOAA
22	9g	Former Fouke Bunkhouse	DRO exceeded Method Two at the water table but soil DRO concentrations were below 10x Rule criterion; deed notice.	X	NFRAP 09/14/04	NOAA
23	9h	Former Alaska Dormitory	Residual soil contaminated with DRO remains in the water table, beneath the building and near water service line; DRO in these soils exceeds the 10x Rule criterion; long term groundwater monitoring (DRO contamination); deed notice.	XX	NFRAP 09/17/04	NOAA
24	9i	E-Shop/Radio Building and Duplex	Residual lead soil 2 ft.+ bgs point of compliance along the southeast side of the Duplex (see Site 60 below) and 5 ft+ along eastside of E-Shop; residual soil contaminated with DRO remains along the northwest corner of the E-Shop, and extends beneath the road and near electric and sewer lines. DRO above 10x Rule criterion remains along the northwest corner of the Duplex; additional removal is hindered by electric, water, telephone and sewer trunk and service lines. DRO above 10x Rule criterion remains along a water line approx. 15 ft. from the northeast section of the E-Shop at 5 ft. bgs; deed notice.	X	NFRAP 02/11/05 FUDS	NOAA
25	9j	5 Car Garage and Anderson Bldg	One sample equaled Method Two DRO cleanup level of 250 mg/kg. Residual benzene in some soils exceeded Method Two level of 0.02, but not above 1991 level of 0.5.	X	NFRAP 11/05/04	NOAA
26	9k	AST Saddle Complex	Residual soil contaminated with DRO remains beyond practical limits of excavation (rock) and likely beneath the road; DRO above 10x Rule criterion remains in the area of the former AST saddles. Benzene above the criterion of 0.02 mg/kg remains in limited areas; benzene concentrations did not exceed the 1991 criterion of 0.5 mg/kg; long term groundwater monitoring (DRO and benzene contamination); deed notice.	XX	NFRAP 11/05/04	TDX/TAC
27	9l	Old Sealing Plant (a.k.a. Barreling Shed)			NFRAP 09/14/04	NOAA
28	9m	Salt Water Wells (a.k.a. Contaminated Salt Water Wells, TPA 9e; TPA Attachment A)	One of three well pump houses was demolished in October 2007, along with the Decommissioned Power Plant building (Site 18). The five wells were decommissioned in 2003 and 2004; contaminated groundwater underlies the sites; deed notice.	X	NFRAP 03/22/05	NOAA

NOAA Site No.	TPA Site No.	Site Name	Site Conditions as of June 4, 2007	Within CWMA[1]	Site Status as of April 2, 2008	Property Owner as of November 6, 2007
29	10	Former Gasoline Tank Farm			NFRAP 02/24/00	NOAA
30	11	Diesel Tank Farm	Residual soil DRO remains beyond practical limits of excavation, near a water main, and beneath the road; deed notice.		NFRAP 11/05/04	NOAA
31	12a	Lukanin Bay Debris Area A			NFRAP 05/05/05	TDX/TAC
32	12b	Lukanin Bay Debris Area B			NFRAP 05/05/05	TDX/TAC
33	12c	Lukanin Bay petroleum contaminated soil	Vegetated soil cap over excavation.		NFRAP 05/05/05	TDX/TAC
34	13a	Salt Lagoon Diesel Seep (uplands)	Residual soil contaminated with DRO and GRO (at one location the level was 310 mg/kg) remains within the smear zone and in the east area among buried concrete rubble associated with the former By-Products Plant; two granular activated carbon reactive permeable walls installed; groundwater monitoring (DRO contamination) until at least October 2008 pending regulatory review; deed notice.		NFRAP 02/13/06)	TDX/TAC
35	13b	Salt Lagoon D. Seep Channel			NFRAP 02/13/06	State of Alaska
36	14	Icehouse Lake (a.k.a. Icehouse Lake Buried Vehicle Boneyard; TPA Attachment A)	Long term groundwater monitoring (DRO, GRO, and lead contamination, although in the 2007 sampling round lead fell below the cleanup criterion) until at least October 2008 pending regulatory review; deed notice.		NFRAP 07/06/05	TDX/TAC
37	15a	Scoria Pit – Telegraph Hill	Potential exists for exposure of buried 55 gallon drums.		NFRAP 08/24/04, FUDS	NOAA
38	15b	Scoria Pit – Lake Hill			NFRAP 04/03/03	TDX/TAC
39	15c	Scoria Pit – Ridge Wall			NFRAP 04/03/03	TDX/TAC
40	NTPA	Aleut Bunkhouse			NFRAP 03/02/01)	TDX/TAC
41	NTPA	Bulldozer in Bog			NFRAP 04/13/01	TDX/TAC
42	NTPA	Explosives Storage Bunker	Blasting caps in a bunker were removed and detonated.		NFRAP 04/13/01	TDX/TAC
43	NTPA	Barrels at North End of Salt Lagoon			NFRAP 01/02/02	TDX/TAC
44	NTPA	Big Polovina Debris			NFRAP 02/01/00	NOAA

NOAA Site No.	TPA Site No.	Site Name	Site Conditions as of June 4, 2007	Within CWMA[1]	Site Status as of April 2, 2008	Property Owner as of November 6, 2007
45	NTPA	SW Point Former LORAN			NFRAP 05/24/01	TDX/TAC
46	NTPA	Blubber Dump Debris	Vegetated soil cap over solid wastes; deed notice.		NFRAP 03/02/01	TDX/TAC and possibly NOAA (the disposal area may have crossed property boundaries)
47	NTPA	Petroleum Contaminated Stockpile (Blubber Dump PCS removal and Polovina Hill Stockpile)			NFRAP 10/08/04 (Blubber Dump Stockpile) NFRAP 02/11/05 (Polovina Hill Stockpile)	NOAA and TDX/TAC (site crosses two properties at Blubber Dump) TDX/TAC (Polovina Hill Stockpile)
48	NTPA	Windmill Wells			NFRAP 07/05/05, FUDS	TDX/TAC
49	9n	Gas Station and Garage	Deed notice to future landowner.	X	NFRAP 10/11/04	NOAA
50	9o	Former Gasoline/ Diesel Drum Storage Area	Residual soil contaminated with DRO and benzene remain, further removal limited by rock and/or slope grade. DRO exceeds 10x rule criterion in certain areas. Residual benzene in soils exceeded Method Two level of 0.02, but not above 1991 level of 0.5; long term groundwater monitoring (DRO contamination); deed notice.	XX	NFRAP 10/11/04	TDX
51	9p	Fuel Transfer Station and Pipeline (Receiving Warehouse)	Residual soil contaminated with DRO and benzene remain along buried utilities south of the transfer pump station; benzene does not exceed 1991 criterion of 0.5 mg/kg; DRO exceeds 10x rule criterion in limited areas; deed notice.	X	NFRAP 09/14/04	NOAA
52	NTPA	Tract 50 asbestos in soil			NFRAP 05/03/04	NOAA
53	9q	Tract A Lot 101	Residual soil contaminated with DRO remains beneath the building and beyond practical limits of removal in soil; deed notice.		NFRAP 10/11/04	NOAA
54	9r	Tract A Lot 102	Residual soil contaminated with DRO remains beneath the building and beyond practical limits of removal; deed notice.		NFRAP 11/01/04	NOAA
55	9s	Tract A Lot 103			NFRAP 10/11/04	NOAA
56	NTPA	ATCO/Radio Bldg Barrel Staging Area	Soil contaminated with DRO, LNAPL, and groundwater contamination remains. Potential landowner liability and/or FUDS; no NOAA liability for soils or LNAPL and groundwater.	XX	FUDS	TDX/TAC
57	NTPA	Tract 46 Sheet Metal Garage	Building demolition only; concrete pad left in place, but partially removed along with the Municipal Garage (Site 9e) demolition and soil removal during 2007.	X	RAC [DOES NOT REQUIRE NFRAP]	NOAA

NOAA Site No.	TPA Site No.	Site Name	Site Conditions as of June 4, 2007	Within CWMA[1]	Site Status as of April 2, 2008	Property Owner as of November 6, 2007
58	NTPA	Tract 50 Foundation DRO Combine Shop UST	Residual soil contaminated with DRO remains beneath the east end of the Combine Shop by former UST and at the water table; Tract 50 soils at the water table exceed Method Two cleanup levels for DRO. Tract 50 soils at the water table exceed Method Two cleanup level of 0.02 mg/kg for benzene, but not the 1991 level of 0.5 mg/kg. Groundwater with dissolved petroleum at Tract 50 foundation; long term groundwater monitoring (DRO contamination) using Site 13a wells until at least 2008 pending regulatory review; deed notice.		NFRAP 07/25/05 (Tract 50 Foundation DRO) NFRAP 11/30/05 (Combine Shop UST)	NOAA and TDX/ TAC (site crosses two properties)
59	NTPA	Big Polovina Debris Stockpile			NFRAP 01/06/06	NOAA
60	NTPA	Lead Contaminated Soils	Lead-based paint abated; Duplex (parcel 6f) residual lead soil remains along southeast end of building 2ft+ bgs point of compliance; deed notice to future landowner of the Duplex; other two locations (Teacher House 101 and Teacher House 103) clean closed.		NFRAP 02/16/07	NOAA

Notes:

[1] X- denotes the site is within the Critical Water Management Area (CWMA); XX – denotes that contaminated soils exceed the CWMA 10x criterion for DRO at the site. Note, DRO and other analytes exceed the CWMA 10x criteria at Site 9f.

AST: Above ground storage tank
BGS: Below ground surface
DRO: Diesel-range organics
FUDS: Formerly Used Defense Site
NFRAP: No Further Remedial Action Planned (received from State of Alaska Department of Environmental Conservation)
NMFS: National Marine Fisheries Service
NOAA: National Oceanic and Atmospheric Administration
NTPA: Non Two-Party Agreement site
PCS: Petroleum-contaminated soil
TAC: The Aleut Corporation (subsurface estate)
TDX: Tanadgusix Corporation (surface estate)
TPA: Two-Party Agreement
UST: Underground storage tank
CWMA: Critical Water Management Area

Appendix I

APPENDIX I TO THE JUNE 4, 2008 REQUEST FOR CLOSURE OF THE ST. PAUL ISLAND, ALASKA, OPERABLE UNIT UNDER THE TWO-PARTY AGREEMENT BETWEEN THE ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION AND THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION SIGNED JANUARY 1996

In accordance with paragraph 59 of the Pribilof Islands Environmental Restoration Agreement (Two-Party Agreement or TPA) signed in January 1996 by designated officials of the State of Alaska and the National Oceanic and Atmospheric Administration (NOAA), NOAA requested Alaska Department of Environmental Conservation (ADEC), as the duly recognized representative of the State of Alaska, certification of NOAA's completion of corrective action for the St. Paul Island Operable Unit (OU). NOAA asserted in its June 4, 2008 cover letter to ADEC that it had completed in accordance with the TPA all investigations and corrective actions approved by ADEC, to the extent practicable by:

- removing drums and debris,
- removing underground storage tanks (USTs) and above ground, storage tanks (ASTs),
- removing fuel pipelines,
- removing contaminated soil,
- closing solid waste sites, and
- characterizing and monitoring groundwater.

Appendix I of two attachments to the request (cover letter) includes portable document format (PDF) versions of closure documents prepared in accordance with TPA paragraphs 42-47 for the fifty-six sites within the St. Paul Island OU. This number (56) exceeded the number (15) of source areas identified in TPA Attachment A concerning St. Paul Island, due to agreed upon changes in the manner of site designation and the discovery of new sites during various phases of site investigation. Appendix I herein does not include formal closure documents for the Oil Drum Dump, Windmill Wells or the ATCO/Radio Building Barrel Storage Area (Sites, 1, 48, and 56, respectively), as they are formerly used defense sites, and precluded from cleanup by NOAA in accordance with Public Law 106-562. Similarly, no formal closure document exists for Tract 46 Sheet Metal Garage (Site 57) as the site did not include any hazardous materials, and general building demolition does not fall under the purview of ADEC regulations applicable to NOAA environmental restoration activities on the Pribilof Islands (TPA paragraph 2).

Conversion of the original documents to PDF resulted in a slight size reduction of the original document format (8.5 x 11 inches); this reduction was necessary to provide this bound printed copy created for archiving and future reference. The cleanup sites are presented in numerical order in accordance with Table 1 accompanying the cover letter. The documents herein generally exclude report appendices which include such items as final laboratory data deliverables, and contractor daily logs. These items are available to ADEC with NOAA's initial site submittals, such as corrective action plans and reports.

NOAA recorded ten deed notices with the Alaska Recorder's Office, Aleutian District located in Anchorage. Copies of these documents are included within Appendix A. Each deed notice accompanies the appropriate closure document for the applicable site. Notice of residual contamination or buried solid waste to be included with federal property transfer documents under a 1984 Transfer of Property Agreement between NOAA and St. Paul Island entities are not included herein as quitclaim deeds have not been issued at the time of this submission.

Appendix II includes copies of a St. Paul Island groundwater and use classification study, ADEC's approval of NOAA's request to apply the ten times rule, ADNR's critical water management area determination, the St. Paul Island long-term groundwater monitoring plan, and a summary of in-situ residual soil and groundwater contamination.

Site Closure Documents

The following sites are available in Volume 1

NOAA Site 1 TPA Site 1: Oil Drum Dump 13

Final Site Characterization Report, Oil Drum Dump Site, (Two-Party Agreement Site No. 1 and Formerly Used Defense Site B-1) 15

E-mail correspondence between Louis Howard, Paula Souik, and John Lindsay RE: St. Paul Oil Drum Dump Site CCR 105

NOAA Site 2 TPA Site 2: Vehicle Boneyard 107

Request for Conditional Closure, Vehicle Boneyard, NOAA Site 2/TPA Site 2, St. Paul Island, Alaska 109

Notice to Deed for a Closed Inert Solid Waste Monofill Formerly Known as Vehicle Boneyard, TPA 2, Reckey #1994250135404, St. Paul Island, Alaska, The National Oceanic and Atmospheric Administration, March 12, 2008 123

NOAA Site 3 TPA Site 3: Little Polovina Boneyard (Little Polovina Hill Buried Vehicle Boneyard, TPA 3; TPA Attachment A) 131

Final Closure Confirmation Report, Little Polovina Hill Vehicle Boneyard (Two-Party Agreement Site No. 3), Pribilof Islands Site Restoration, St. Paul Island, Alaska 133

Letter from Louis Howard to John Lindsay RE: Draft Confirmation Report-TPA Site No. 3 Little Polovina Hill Vehicle Boneyard January 13, 2000. Dated March 3, 2000 149

NOAA Site 4 TPA Site 4: Dune Vehicle Boneyard 151

Site Closure Report - Final, Dune Vehicle Boneyard, (Two-Party Agreement Site 4) 153

Letter from Louis Howard to John Lindsay RE: Site Closure Report Draft Dune Vehicle Boneyard TPA 4 Pribilof Islands Site Restoration Project St. Paul Island, AK January 24, 2001. Dated February 20, 2001 169

NOAA Site 5 TPA Site 5a: St. Paul Landfill (Active Cell C) (St. Paul Landfill, TPA 5; TPA Attachment A) 171

Closure Report, Site 5/TPA Site 5a – St. Paul Landfill Cell C (Tract 42), St. Paul Island, Alaska 173

Letter from John Lindsay to Louis Howard, RE: Review and Approval of *Closure Report, Site 5a/TPA Site 5 – St. Paul Landfill Cell C (Tract 42)*, dated September 19, 2005. Dated September 19, 2005 205

Letter from John Lindsay to Leslie Simmons, RE: Review and Approval of *Closure Report, Site 5a/TPA Site 5 – St. Paul Landfill Cell C (Tract 42)*, dated September 19, 2005. Dated September 19, 2005 209

Letter from Leslie Simmons to John Lindsay, RE: Closure Report for Site 5a, St. Paul Landfill Cell C, Tract 42. Dated November 7, 2005 213

Letter from John Lindsay to Robert J. Blankenburg RE: Technical Memorandum, Request for Re-Closure of Site 5a/TPA Site 5 – St. Paul Landfill Cell C (Tract 42) St. Paul Island, Alaska. Dated December 14, 2007 215

Letter from Robert J. Blankenburg to John Lindsay RE: Approval of Re-Closure of Site 5a/TPA Site 5–St. Paul Landfill Cell C (Tract 42) St. Paul, Alaska. Dated January 24, 2008....225

NOAA Site 6 TPA Site 5b: Cell A (St. Paul Landfill, TPA 5; TPA Attachment A) ..227

Request for Conditional Closure, St Paul Landfill Cell A, TPA Site 5b, NOAA Site 6, St. Paul Island, Alaska 229

Notice of Environmental Cleanup and Residual Soil and Debris at TPA05 (b), NOAA Cell A Landfill, St. Paul Island, Alaska....245

NOAA Site 7 TPA Site 5c: Cell B drum dump (St. Paul Landfill, TPA 5; TPA Attachment A) 253

Request for Conditional Closure Site 7/TPA Site 5c – St. Paul Landfill Cell B (Drum Dump) St. Paul Island, Alaska 255

Notice of Environmental Cleanup and Residual Soil and Debris at TPA05 (c and d), NOAA Cell B Landfill, St. Paul Island, Alaska 275

NOAA Site 8 TPA Site 5d: Cell B solid waste (St. Paul Landfill, TPA 5; TPA Attachment A) 283

Request for Conditional Closure, St Paul Landfill Cell B (Solid Waste), TPA Site 5d, NOAA Site 8 285

Notice of Environmental Cleanup and Residual Soil and Debris at TPA05 (c and d), NOAA Cell B Landfill, St. Paul Island, Alaska 295

NOAA Site 9 TPA Site 6: Pumphouse Lake....303

Site Closure Report – Final, Pumphouse Lake (Two-Party Agreement Site 6), Pribilof Islands Site Restoration, St. Paul Island, Alaska....305

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report Pumphouse Lake Two Party Agreement Site No. 6 Pribilof Islands Site Restoration Project, St. Paul Island, AK, February 23, 2001. Dated April 11, 2001.. 315

NOAA Sites 10–13 (NMFS Fuel Barges, TPA 7; TPA Attachment A)....317

NOAA Site 10 – TPA Site 7a: NMFS Fuel Barge: North End Lagoon

NOAA Site 11 – TPA Site 7b: NMFS Fuel Barge: Lagoon Channel

NOAA Site 12 – TPA Site 7c: NMFS Fuel Barge: Black Bluff

NOAA Site 13 – TPA Site 7d: NMFS Fuel Barge: East Landing

Site Closure Report - Draft, NMFS Fuel Barges: "A," "B," "C" and "D" (Two-Party Agreement Site 7), Pribilof Islands Site Restoration, St. Paul Island, Alaska....319

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report TPA Site 7-NMFS Fuel Barges A, B, C, D St. Paul Island, Alaska November 19, 2001. Dated January 2, 2002.....349

NOAA Sites 14, 15 (NOAA Landfill, TPA 8; TPA Attachment A) 351

NOAA Site 14 – TPA Site 8a: NOAA (NMFS) Reef Point Landfill

NOAA Site 15 – TPA Site 8b: NOAA (Village) Landfill

Site Closure Report – DRAFT, NOAA Landfill: Cliffside Dump and Reef Point Shoreline Site (Two-Party Agreement Site 8), Pribilof Islands Site Restoration, St. Paul Island, Alaska 353

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report for NOAA Landfill Cliffside Dump and Reef Point: TPA 8 St. Paul Island November 2001. Dated December 19, 2001 369

Notice of Environmental Cleanup and Residual Soil and Debris at TPA08, NOAA (Village) Landfill, St. Paul Island, Alaska 373

NOAA Site 16 TPA Site 9a: Old Movie Theater 379

Request for NFRAP, Old Movie Theater, TPA 9a/Site 16, St. Paul Island, Alaska 381

NOAA Site 17 TPA Site 9b: Former Power Plant (Former Post Office) 391

Request for NFRAP, Former Power Plant, TPA 9b/Site 17, St. Paul Island, Alaska 393

Notice of Environmental Cleanup and Residual Soil and Groundwater Contamination at TPA9b, Former Power Plant, St. Paul Island, Alaska 405

NOAA Site 18 TPA Site 9c: Decommissioned Power Plant (USTs Site (Tract 41), TPA 9a; Power Plant (Tract 41) – Includes former Power Plant site, TPA 9b; TPA Attachment A) 413

Request for Conditional Closure: Decommissioned Power Plant, TPA Site 9c/Site 18, St. Paul Island, Alaska 415

Corrective Action Report, Decommissioned Power Plant Demolition and Contaminated Soil Removal — NOAA Site 18/TPA Site 9c, St. Paul Island, Alaska 431

NOAA Site 19 TPA Site 9d: Decommissioned Power Plant Annex 471

Request for NFRAP, Decommissioned Power Plant Annex, TPA Site 9d/Site 19, St. Paul Island, Alaska 473

NOAA Site 20 TPA Site 9e: Machine Shop/Municipal Garage (USTs Site (Tract 41), TPA 9a; Municipal Garage – UST vent/fill pipe (Tract 41), TPA 9c; Municipal Garage Drum Staging Area (Tract 41), TPA 9d; TPA Attachment A) 485

Request for NFRAP, Municipal Garage/Machine Shop, TPA Site 9e, NOAA Site 20, St. Paul Island, Alaska 487

Corrective Action Report and Conditional Closure Request, Municipal Garage Demolition and Contaminated Soil Removal, NOAA Site 20/TPA Site 9e, St. Paul Island, Alaska 511

Letter from Louis Howard to John Lindsay RE: Corrective Action Report and Conditional Closure Request-Municipal Garage Demolition Soil Removal NOAA Site 20/TPA Site 9e. Dated April 9, 2008 573

NOAA Site 21 TPA Site 9f: Old Coal Shed (Cascade Bldg) (USTs Site (Tract 41), TPA 9a; TPA Attachment A) 575

Request for Conditional Closure, Old Coal Shed (Cascade Building), TPA Site 9f/NOAA Site 21, St. Paul Island, Alaska 577

NOAA Site 22 TPA Site 9g: Former Fouke Bunkhouse.....597

Request for NFRAP, Former Fouke Bunkhouse TPA Site 9g/Site 22, St. Paul Island, Alaska 599

NOAA Site 23 TPA Site 9h: Former Alaska Dormitory 611

Request for NFRAP, Former Alaska Dormitory,TPA 9h/Site 23, St. Paul Island, Alaska.....613

NOAA Site 24 TPA Site 9i: E-Shop/Radio Building and Duplex.....623

Request for Conditional Closure TPA Site 9i, NOAA Site 24, - Duplex Building and E-Shop, St. Paul Island, Alaska 625

Letter from Louis Howard to John Lindsay RE: Request for Corrective Action at Duplex 108, St. Paul Island. Dated December 2, 2005 641

Letter from Louis Howard to John Lindsay RE: Request for Corrective Action at Duplex 109, St. Paul Island. Dated December 2, 2005 643

Subject: Review and Approval of *Corrective Action Plan for the Removal of Lead Contaminated Soil at Teacher Houses 101 and 103, and the Duplex, Lead Contaminated Soils Site (NOAA Site 60, Non-TPA)*, St. Paul Island, Alaska, dated May 15, 2006. Dated May 15, 2006.....645

NOAA Site 25 TPA Site 9j: 5 Car Garage and Anderson Bldg.....649

Request for NFRAP, TPA Site 9j - Five Car Garage and Anderson Building, St. Paul Island, Alaska 651

NOAA Site 26 TPA Site 9k: AST Saddle Complex.....665

Request for NFRAP, AST Saddle Complex, TPA Site 9k/Site 26, St. Paul Island, Alaska 667

Notice of Environmental Cleanup and Residual Soil and Groundwater Contamination at TPA9k, (Former) AST Saddles Site, St. Paul Island, Alaska.....683

NOAA Site 27 TPA Site 9l: Old Sealing Plant (Barreling Shed).....691

Request for NFRAP, Old Sealing Plant/Barreling Shed, TPA Site 9ℓ/Site27, St. Paul Island, Alaska 693

NOAA Site 28 TPA Site 9m: Salt Water Wells (Contaminated Salt water Wells TPA 9e; TPA Attachment A).....705

Request for Conditional Closure, Saltwater Wells, NOAA Site 28/TPA Site 9m, St. Paul Island, Alaska 707

NOAA Site 29 TPA Site 10: Former Gasoline Tank Farm 725

Final Site Characterization Report Former Gasoline Tank Farm, Two-Party Agreement Site No. 10, Pribilof Islands Site Restoration, St. Paul Island, Alaska 727

Letter from Louis Howard to John Lindsay RE: Draft Site Characterization Report Former Gasoline Tank Farm TPA Site No. 10, St. Paul Island, January 13, 2000. Dated February 24, 2000.....747

NOAA Site 30 TPA Site 11: Diesel Tank Farm (Demolished Diesel Tank Farm (Tract 43), TPA 11; TPA Attachment A).....749

Request for NFRAP Former Diesel Tank Farm, TPA Site 11/Site 30 St. Paul Island, Alaska.....751

NOAA Sites 31–33 (Lukanin Bay Debris, TPA 12; TPA Attachment A).....769

NOAA Site 31 – TPA Site 12a: Lukanin Bay Debris Area A

NOAA Site 32 – TPA Site 12b: Lukanin Bay Debris Area B

NOAA Site 33 – TPA Site 12c: Lukanin Bay petroleum contaminated soil

Request for Conditional Closure, Lukanin Bay SiteTPA Sites 12a, 12b, 12c/NOAA Sites 31, 32, 33, St. Paul Island, Alaska 771

NOAA Sites 34–35 (Salt Lagoon Diesel Deep, TPA 13; TPA Attachment A).....787

NOAA Site 34 – TPA Site 13a: Salt Lagoon Diesel Seep (uplands)

NOAA Site 35 – TPA Site 13b: Salt Lagoon Diesel Seep Channel

Request for Conditional Closure, Salt Lagoon Diesel Seep, NOAA Sites 34 and 35/TPA Sites 13a and 13b, St. Paul Island, Alaska.....789

Notice of Environmental Cleanup and Groundwater Contamination at TPA13, Salt Lagoon Diesel Seep, St. Paul Island, Alaska 803

The following sites are available in Volume 2

NOAA Site 36 TPA Site 14: Icehouse Lake (Icehouse Lake Buried Vehicle Boneyard, TPA 14; TPA Attachment A).....811

Request for Conditional Closure Icehouse Lake, NOAA Site 36, TPA Site 14, St. Paul Island, Alaska 813

Notice of Environmental Cleanup and Groundwater Contamination at TPA14, Icehouse Lake, St. Paul Island, Alaska.....823

NOAA Site 37 TPA Site 15a: Scoria Pit – Telegraph Hill (Scoria Pits, TPA 15; TPA Attachment A) 829

Final Site Characterization Report, Telegraph Hill Scoria Pit Site, Two-Party Agreement Site No. 15-1, Pribilof Islands Environmental Restoration Project, St. Paul Island, Alaska 831

Letter from Louis Howard to John Lindsay RE: Telegraph Hill Two-Party Agreement (TPA) Site 15, St. Paul Island, Alaska July 2004. Dated August 24, 2004.....913

Letter from Louis Howard to John Lindsay RE: Telegraph Hill Two-Party Agreement (TPA) Site 15-1, St. Paul Island, Alaska. Dated Feb. 16, 2005 915

NOAA Site 38 TPA Site 15b: Scoria Pit – Lake Hill (Scoria Pits, TPA 15; TPA Attachment A) 917

St. Paul Island, Alaska Request for No Further Action Lake Hill Scoria Pit TPA Site No. 15b.....919

Letter from Louis Howard to John Lindsay RE: St. Paul Island Request for No Further Action Lake Hill Scoria Pit TPA Site No. 15b. Dated April 3, 2003 943

NOAA Site 39 TPA Site 15c: Scoria Pit – Ridge Wall (Scoria Pits, TPA 15; TPA Attachment A) 945

St. Paul Island, Alaska Request for No Further Action Ridge Wall Scoria Pit TPA Site No. 15c .. 947

Letter from Louis Howard to John Lindsay RE: St. Paul Island Request for No Further Action Wall Scoria Pit TPA Site No. 15c. Dated April 3, 2003 969

NOAA Site 40 NTPA: Aleut Bunkhouse 971

Site Closure Report – Draft - Former Aleut Bunkhouse (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska 973

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report Former Aleut Bunkhouse (Non Two Party Agreement Site) Pribilof Islands Site Restoration Project, St. Paul Island, AK February 1, 2001. Dated March 2, 2001 985

NOAA Site 41 NTPA: Bulldozer in Bog 987

Site Closure Report – Final, Abandoned Bulldozer (Non Two-Party Agreement Site, Pribilof Islands Site Restoration, St. Paul Island, Alaska 989

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report Abandoned Bulldozer Non-Two Party Agreement (TPA) Site Pribilof Islands Site Restoration Project, St. Paul Island, AK March 7, 2001. Dated April 13, 2001 1005

NOAA Site 42 NTPA: Explosives Storage Bunker 1007

Site Closure Report – Final, Concrete Storage Bunker – Explosives Discovery & Demolition (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska 1009

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report Concrete Storage Bunker-Explosives Discovery & Demolition Non-Two Party Agreement (TPA) Site Pribilof Islands Site Restoration Project, St. Paul Island AK March 27, 2001. Dated April 13, 2001 1019

NOAA Site 43 NTPA: Barrels at North End of Salt Lagoon 1021

Site Closure Report - Draft, Salt Lagoon Drum Removal Site, (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska 1023

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report Salt Lagoon Drum Removal NON-TPA Site, St. Paul Island November 2001. Dated January 2, 2002 1037

NOAA Site 44 NTPA: Big Polovina Debris 1041

Technical Memorandum Debris Removal Polovina Hill Debris Site,St. Paul Island, Alaska 1043

Letter from Louis Howard to John Lindsay RE: Draft Technical Memorandum Debris Removal Polovina Hill Debris Non-TPA Site December 17, 1999. Dated February 1, 2000 1051

NOAA Site 45 NTPA: SW Point Former LORAN 1053

Final Interim Removal Action Report, St. Paul Island, AK 1055

Letter from Louis Howard to John Lindsay RE: Draft Interim Action Report for Southwest point Battery Site Non-TPA Site St. Paul Island Version 2.0 March 15, 2001 1081

Site Cleanup Report - Final, Former Southwest Point LORAN Station Site (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska 1083

Letter from Louis Howard to John Lindsay RE: Draft Site Cleanup Report for Southwest Point LORAN Station Battery Debris Site (Non-TPA Site) Pribilof Islands Restoration St. Paul Island April 24, 2001. Dated May 24, 2001 1097

NOAA Site 46 NTPA: Blubber Dump Debris 1099

Debris Removal Report - Draft - Former Blubber Dump (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska 1101

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report Former Blubber Dump (Non Two Party Agreement Site) Pribilof Islands Site Restoration Project, St. Paul Island, AK February 5, 2001. Dated March 2, 2001 1113

Notice of Environmental Cleanup and Residual Soil and Debris at Blubber Dump Debris Site, St. Paul Island, Alaska 1115

NOAA Site 47 NTPA: Petroleum Contaminated Stockpile (Blubber Dump PCS removal and Polovina Hill Stockpile) 1121

Final Closure Report, Blubber Dump/Enhanced Thermal Conduction Soil Treatment Facility, St. Paul Island, Alaska 1123

Letter from Louis Howard to John Lindsay RE: Draft Closure Report for Blubber Dump Enhanced Thermal Conduction Soil Treatment Facility Site 47, St. Paul Island dated October 1, 2004. Dated October 8, 2004 1153

Request for Conditional Closure, Polovina Hill Stockpile, non-TPA Site 47, St. Paul Island, Alaska 1155

NOAA Sites 48, 56 1165

NOAA Site 48 – NTPA: Windmill Wells

NOAA Site 56 – TPA Site NTPA: ATCO/Radio Bldg Barrel Staging Area

The History of Parcel 6f, the ATCO Building, and the Windmill Wells on St. Paul Island, Alaska as it Relates to Soil and Groundwater Cleanup Needs and Responsibilities 1167

Letter from Louis Howard to John Lindsay RE: Cleanup Needs and Responsibilities for Parcel 6f, the ATCO Building and the Windmill Wells on St. Paul Island June 2005. Dated July 5, 2005 1197

NOAA Site 49 TPA Site 9n: Gas Station and Garage 1199

Request for NFRAP, Gas Station and Garage, TPA Site 9n/Site 49, St. Paul Island, Alaska 1201

NOAA Site 50 TPA Site 9o: Former Gasoline/Diesel Drum Storage 1211

Request for NFRAP Former Gasoline/Diesel Fuel Drum Storage Site, TPA Site 9o/Site 50, St. Paul Island, Alaska 1213

Letter from Louis Howard to John Lindsay RE: Request for No Further Remedial Action Planned Determination Former Gasoline/Diesel Fuel Drum Storage Site, TPA 9o Site 50, St. Paul Island October 2004. Dated October 11, 2004 1227

Notice of Environmental Cleanup and Residual Soil and Groundwater Contamination at TPA09o, Gas/Diesel Drum Storage, St. Paul Island, Alaska 1229

NOAA Site 51 TPA Site 9p: Fuel Transfer Station and Pipeline (Receiving Warehouse) 1237

Request for NFRAP, West Dock Fuel Transfer Facility, TPA Site 9p/Site 51, St. Paul Island, Alaska 1239

NOAA Site 52 NTPA: Tract 50 Asbestos in Soil 1249

Request for NFRAP, Asbestos Removal, Tract 50, St. Paul Island, Alaska 1251

NOAA Site 53 TPA Site 9q: Tract A Lot 101 1263

Request for NFRAP, House 101, TPA Site 9q/Site 53, St. Paul Island, Alaska 1265

Letter from Louis Howard to John Lindsay RE: Request for No Further Remedial Action Planned Determination Rescinded House 101 TPA Site No. 9q, St. Paul Island. Dated December 2, 2005 1275

Letter from John Lindsay to Louis Howard RE: Review and Approval of Corrective Action Plan for the Removal of Lead Contaminated Soil at Teacher Houses 101 and 103, and the Duplex, Lead Contaminated Soils Site (NOAA Site 60, Non-TPA), St. Paul Island, Alaska, dated May 15, 2006 1277

NOAA Site 54 TPA Site 9r: Tract A Lot 102 1281

Request for NFRAP, House 102, TPA Site 9r/Site 54, St. Paul Island, Alaska 1283

NOAA Site 55 TPA Site 9s: Tract A Lot 103 1295

Request for NFRAP, House 103, TPA Site 9s/Site 55 St. Paul Island, Alaska 1297

Letter from Louis Howard to John Lindsay RE: Request for No Further Remedial Action Planned Determination Rescinded House 103 TPA 9S Site 55, St. Paul Island. Dated December 2, 2005 1307

Letter from Louis Howard to John Lindsay RE: Review and Approval of *Corrective Action Plan for the Removal of Lead Contaminated Soil at Teacher Houses 101 and 103, and the Duplex, Lead Contaminated Soils Site (NOAA Site 60, Non-TPA)*, St. Paul Island, Alaska, dated May 15, 2006. Dated May 15, 2006 1309

NOAA Site 56 TPA Site NTPA: ATCO/Radio Bldg Barrel Staging Area 1313

NOAA Site 57 TPA Site NTPA: Tract 46 Sheet Metal Garage 1315

NOAA Site 58 NTPA: Tract 50 Foundation DRO, Combine Shop UST 1319

Request for Conditional Closure Combine Shop, NOAA Tract 50, St. Paul Island, Alaska 1321

Request for Conditional Closure Tract 50 Drum Platform Foundation Site NOAA Site 58, St. Paul Island, Alaska 1335

NOAA Site 59 NTPA: Big Polovina Debris Stockpile 1347

Letter from John Lindsay to Louis Howard RE: Technical Memorandum, Characterization Soil Sample Collection at the Former Big Polovina Hill Debris Pile. Dated January 3, 2006 1349

NOAA Site 60 NTPA: Lead Contaminated Soils 1357

Corrective Action Report/Conditional Closure Request NOAA Site 60/Non-TPA – Lead Contaminated Soils, St. Paul Island, Alaska 1359

NOAA Site 36
TPA Site 14: Icehouse Lake
(Icehouse Lake Buried Vehicle Boneyard, TPA 14; TPA Attachment A)

Request for Conditional Closure Icehouse Lake, NOAA Site 36, TPA Site 14, St. Paul Island, Alaska 813

Notice of Environmental Cleanup and Groundwater Contamination at TPA14, Icehouse Lake, St. Paul Island, Alaska 823

Request for Conditional Closure
Icehouse Lake, NOAA Site 36, TPA Site 14
St. Paul Island, Alaska

Request for Conditional Closure

Site: Icehouse Lake Site, also known as National Oceanic and Atmospheric Administration (NOAA) Site 36/ Two-Party Agreement (TPA) Site 14. The site will be referred to as the site herein.

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea (Figure 1). The site is located on the east shore of Icehouse Lake, approximately one mile north of the City of St. Paul, adjacent a prominent bend in Polovina Turnpike which passes west of the site (Figure 2).

Legal Property Description: The site is located in Township 35 south, Range 131 west, Section 19, of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986 (Figure 2). The Aleut Corporation owns the subsurface estate. The surface estate is owned by the St. Paul Village Corporation.

Type of Release: Petroleum products likely powered and lubricated a diesel water pump that was located at the site. Five 100-gallon aboveground storage tanks (AST) and several drums were removed from the surface of the site in 1992, along with some buried drums and piping. These items may have been associated with fuel storage and transfer, and may have leaked or spilled petroleum products in the past. Igniter materials, such as gasoline, used for community recreational bonfires at the site may also have contributed to soil and groundwater contamination.

History and Background:
The United States government used lake water from Icehouse Lake as a freshwater source for the Village of St. Paul from the 1920s to the late 1950s. Initially a windmill, and later a diesel powered pump operated on the site to transport the water. Thereafter, water was drawn from Pumphouse Lake located near the National Weather Service Station, and then from wells placed east of Telegraph Hill. Third parties demolished the Icehouse Lake pumphouse and other structures in the early 1990s and added the current scoria pad. Until the access road was blocked in the summer of 2004, the site had been used by members of the community to accumulate scrap wood items such as pallets, which were periodically burned on the site as a community recreational event. Igniters, such as gasoline and diesel fuel, were used to light the bonfires.

Summary of Site Investigations:
Preliminary Assessment by Ecology and Environment, Inc (E&E): E&E, conducted a preliminary assessment (PA) for NOAA at several sites on St. Paul Island in 1992 (E&E 1993). The PA provided the framework for the TPA. During the PA, E&E conducted a visual assessment of the site, noting one or two abandoned 500-gallon ASTs, several drums on the ground, and submerged drums and piping. In 1996, the TPA identified the Icehouse Lake Site as Site 14 classifying it as a debris site.

Debris Removal by Aleutian Enterprises: In 1997, Aleutian Enterprises removed an abandoned AST, five steel drums, and submerged piping from the site (Aleutian Enterprises 1997).

Final Closure Confirmation by Tetra Tech EM Inc.: In 1999, Tetra Tech EM Inc. (Tetra Tech) conducted an electromagnetic survey, locating and then removing the remains of approximately seven rusted, empty, steel drums (Tetra Tech 2000). They did not find any contamination associated with the drums. NOAA subsequently identified TPA Site 14 as Site 36 on a list of sites on St. Paul Island.

Reconnaissance Sampling by Columbia Environmental Sciences Inc. (CESI): In 2000, CESI conducted reconnaissance sampling for subsurface contamination at the site that was expected to be limited in extent (CESI 2001). CESI excavated a test pit 20 ft long by 15 ft wide by 5 ft deep adjacent to the former pumphouse and fuel tank location. CESI also installed four hand-operated Geoprobe boreholes, as well as four hollow-stem auger borings that were completed as monitoring wells. PetroFlag® screening, a semi-quantitative field analytical method for total petroleum hydrocarbons (TPH), and fixed laboratory analyses indicated that soil was locally contaminated with

petroleum-related hydrocarbons [gasoline-range organics (GRO), diesel-range organics (DRO), residual-range organics (RRO), toluene, xylenes, and the trimethylbenzene isomers] in the vicinity of the gravel pad. The excavation revealed visible contamination from about 3 ft bgs to the water table at approximately 6 ft bgs. CESI noted a heavy sheen on groundwater in the excavation (CESI 2001). The soil removed from the test pit was returned to the pit. Analytical results from CESI's soil sampling did not indicate any soil exceeding the ADEC Method Two cleanup level. The four monitoring wells were not developed or sampled until IT Alaska Inc.'s (IT Alaska's) work at the site in 2001, which is discussed below.

Site Characterization by IT Alaska Inc.: NOAA contracted with IT Alaska to conduct characterization activities for the site, resulting in a site characterization report ultimately completed by NOAA (NOAA 2004a). IT Alaska performed the fieldwork between June 23 and July 21, 2001. They conducted follow-up site work between September 4 and 6, 2001, after reviewing the initial fixed laboratory results. IT Alaska performed the following site characterization activities at the site:

- Conducted soil sampling on a systematic grid-based pattern using hand augers, screening 131 soil samples for petroleum hydrocarbons by using PetroFlag® (Figure 3). A total of 15 samples from nine of the soil borings exceeded the selected 200 ppm TPH cut off value. These borings suggested an elongated zone of mostly low-level contamination (greater than 200 ppm TPH) extending approximately 90 feet from east to west, and up to 20 feet north to south.
- Collected 32 samples from additional hand auger borings, which were submitted to a fixed laboratory for analysis to verify the results of the screening samples. Results from all 32 of the samples were well below the ADEC Table A1, B2, and Method Three soil cleanup levels for DRO and RRO (the only two analytes measured in these samples).
- Collected five characterization samples to characterize the chemical constituents present. The samples were submitted to a fixed laboratory for analysis after being collected from soil at locations where high levels of contamination was suspected from observation or from high screening sample results. The samples were analyzed for GRO, DRO, RRO, volatile organic compounds, polynuclear aromatic hydrocarbons, and metals. The samples did not exceed cleanup levels under ADEC Method Three (the cleanup method selected for this site as discussed below) for any of these contaminants. Moderate levels of DRO and RRO exceeding ADEC Method Two were present.
- Collected 15 follow-up samples from soil borings within the area excavated by CESI in 2000. The samples were submitted to a fixed laboratory for analysis. One of these samples exceeded the ADEC Method Three cleanup level for DRO, and two exceeded the Method Three cleanup level for benzene. However, none of the samples exceeded the 18 AAC 65 cleanup level for benzene (ADEC 1991), the cleanup level selected for this site as discussed below.
- Installed two groundwater monitoring wells to determine the vertical and lateral extent of contamination and its impact on groundwater.
- Developed four monitoring wells previously installed by CESI, along with the two new monitoring wells, collected groundwater samples for laboratory analysis, and performed slug testing at one well. The groundwater in well MWIHL-2 exceeded the GRO cleanup level for groundwater under 18 AAC 65.345, Table C, and the groundwater in well MWIHL-4 exceeded the GRO and DRO cleanup levels for groundwater under 18 AAC 65.345, Table C (IT Alaska 2002; Figure 4).
- Collected two lake sediment samples from near the shoreline of Icehouse Lake adjacent to the zone of contaminated soil. Neither of these samples exceeded any ADEC cleanup levels.
- Collected seven samples for general chemical and physical analysis to characterize total organic carbon, grain size, and bulk density for potential application of ADEC Method Three procedures.

Figure 3 shows the location of historical soil samples at the site. Some sample locations were only analyzed by screening analysis using PetroFlag® test kits. Where these samples exceeded the cleanup levels, additional samples were collected and analyzed by off site laboratories. As a result of the site characterization fieldwork, NOAA found only four samples where soil exceeded ADEC soil cleanup standards under Method One or Two

(Figure 3). Only one soil sample exceeded the Method Three cleanup level calculated by NOAA in the Final Site Characterization Report (NOAA 2004a). The only contaminant in that sample that exceeded the Method Three cleanup level was DRO, for which NOAA calculated the Method Three cleanup level to be 1,260 mg/kg. NOAA determined that the area where soil exceeded the Method Three cleanup level was very small and warranted the removal of a small amount of soil at the location of the sample exceeding the cleanup level.

NOAA also identified a plume of groundwater contaminated with DRO and GRO above ADEC Table C cleanup standards (NOAA 2005). Figure 4 shows the groundwater sampling results exceeding ADEC Table C and the apparent groundwater gradient at the site derived from groundwater elevation measurements made during the site characterization (NOAA 2004a). Groundwater under the site flows away from Icehouse Lake in an easterly direction. NOAA recommended that the groundwater be monitored semi-annually at four monitoring wells (MWIHL 2,3,4, and 5) to verify that contamination exceeding the Table C levels is not migrating off site, and that over time, natural attenuation will stabilize or reduce the level of contamination currently observed.

Summary of Applied Cleanup Levels:
The TPA allows NOAA to apply cleanup levels using the methods described in the 1991 non-underground storage tank (UST) regulations (ADEC 1991). However with ADEC approval, NOAA elected to use current regulations (ADEC 2003) to address soil cleanup, except for benzene for which NOAA applied the 1991 cleanup level. NOAA presented the applied cleanup methods in the Icehouse Lake Corrective Action Plan (NOAA 2004b). In summary, the current State of Alaska Oil and Hazardous Substances Pollution Control Regulations (Title 18 of the *Alaska Administration Code* [AAC] 75) provides four methods to determine soil cleanup levels at petroleum-contaminated sites. Method One involves the use of Table A1 of 18 AAC 75.341(a) to calculate a cleanup level and can only be applied to sites where the groundwater does not contain hazardous substances associated with the site. Method Two, discussed at 18 AAC 75.341(c), employs two separate tables, including one for individual contaminants (Table B1) and one for petroleum hydrocarbon contaminants (Table B2). Method Three, discussed at 18 AAC 75.340(e), allows substitution of site-specific data for selected parameters used in the Method Two equations. Method Four, discussed at 18 AAC 75.340(f), requires the development and subsequent ADEC approval of a site specific risk assessment (ADEC 2003).

NOAA applied Method Three for the Icehouse Lake Site because contaminants above Table C levels occurred in groundwater at the site, precluding the use of Method 1. Also, site-specific parameters measured at the site, such as soil type and organic content, allow the calculation of site specific cleanup levels under Method Three that are protective of human health and the environment. NOAA calculated the Method Three cleanup levels in the Final Site Characterization Report (NOAA 2005b). Under Method Three, DRO remained as the only contaminant of concern in soil. A single soil sample exceeded the Method Three DRO migration to groundwater pathway cleanup level at 1,260 mg/kg.

Summary of Cleanup Actions:
Tetra Tech conducted corrective action activities on July 2, 2004, removing approximately 72 cubic yards of soil. Two confirmation samples (Figure 5) confirmed that the remaining soil was not contaminated above the ADEC Method Three cleanup level. The excavation was backfilled to original grade.

NOAA obtained a burn permit from the City of St. Paul on September 22, 2004 to burn wood waste previously accumulated at the site by members of the community. NOAA burned the wood that day and recovered the ash and disposed it at the Tract 42 landfill. The entrance road to the site was blocked with old crab pots to prevent continued dumping at the site.

Recommended Action:
In accordance with paragraph 59 of the TPA (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action to the maximum extent practicable in accordance with the TPA at the Icehouse Lake Site, NOAA Site 36, TPA Site 14, St. Paul Island, Alaska, and further ADEC grant a conditional closure that will not require further remedial action from NOAA. ADEC will require additional containment, investigation, or cleanup if subsequent information indicates that the level of residual contamination does not protect human health, safety, or welfare, or the environment.

References:

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels. Contaminated Sites Program*. July 17.

ADEC. 2002. *Cumulative Risk Guidance*. November 7.

ADEC. 2003. 18 AAC 75, Articles 3 and 9. *Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. Effective date January 30, 2003.

Aleutian Enterprises. 1997. *NOAA Debris Cleanup, St. Paul Island, Alaska, Project Closeout Report*. November 15.

Columbia Environmental Sciences, Inc. (CESI). 2001. *Final Site Reconnaissance Report, St. Paul Island, AK Ice House Lake Boneyard (TPA Site 14)*. April 12.

Ecology and Environment, Inc. (E&E). 1993. *Preliminary Assessment of the National Oceanic and Atmospheric Sites , Pribilof Islands, Alaska*. February.

IT Alaska, Inc. (IT Alaska). 2002. *Draft Annual Groundwater Monitoring Report 2001, St. Paul Island, Alaska*. March.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*, Attorney General's Office File No. 66 1-95-0126. January 26, 1996.

NOAA. 2004a. *Draft Site Characterization Report Icehouse Lake (Site 36/TPA Site 14)*. May 5.

NOAA. 2004b. *Draft Corrective Action Plan Icehouse Lake (Site 36/TPA Site 14) Petroleum and Lead Contaminated Soils St. Paul Island, Alaska*. May 5.

NOAA. 2005a. *Final Corrective Action Report Icehouse Lake (Site 36/TPA Site 14 St. Paul Island, Alaska*. May 24.

NOAA. 2005b. *Final Site Characterization Report, Icehouse Lake (Site 36/TPA Site 14 St. Paul Island, Alaska*. May 26.

Tetra Tech EM, Inc. (Tetra Tech). 2000. *Final Closure Confirmation Report Ice House Lake Boneyard Two-Party Agreement Site No. 14, Pribilof Islands Site Restoration St. Paul Island, Alaska*. November.

Tetra Tech. 2005. Draft Field Investigation Report, St. Paul Island, Alaska. May 2.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

6/21/05
Date

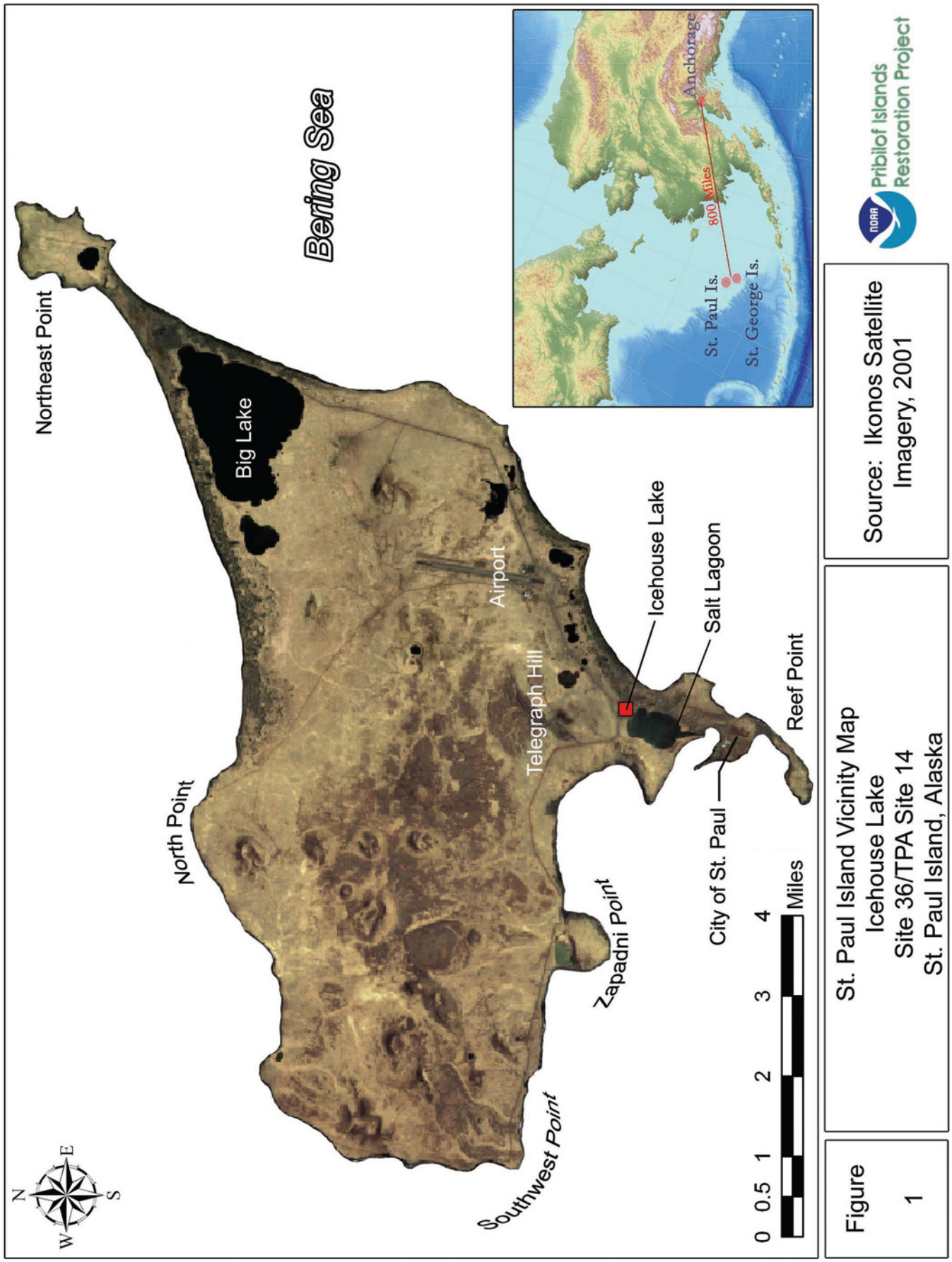
Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed to the maximum extent practicable at the Icehouse Lake Site, NOAA Site 36, TPA Site 14, St. Paul Island, Alaska, in accordance with the Agreement and that no further remedial action is required for soils as a part of this conditional closure granted by ADEC.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

07/06/05
Date

Figures


Bering Sea
Northeast Point
Big Lake
North Point
Airport
Telegraph Hill
Icehouse Lake
Salt Lagoon
Reef Point
City of St. Paul
Zapadni Point
Southwest Point
N
E
S
W
0 0.5 1 2 3 4
Miles
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Pribilof Islands Restoration Project
Source: Ikonos Satellite Imagery, 2001
St. Paul Island Vicinity Map
Icehouse Lake
Site 36/TPA Site 14
St. Paul Island, Alaska
Figure
1

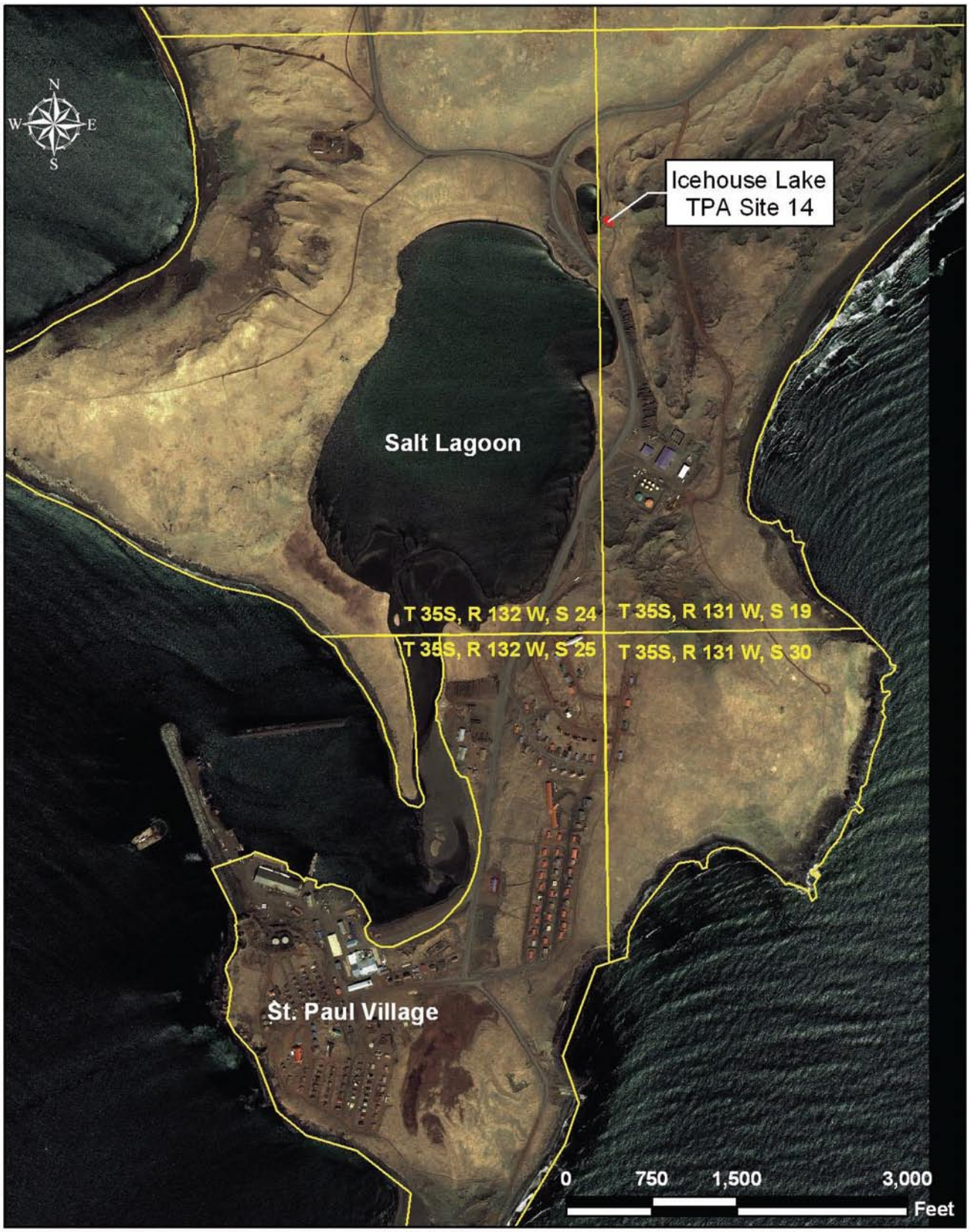


Figure 2	Site Area Map Icehouse Lake Site 36/TPA Site 14 St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001.

Pribilof Islands Restoration Project

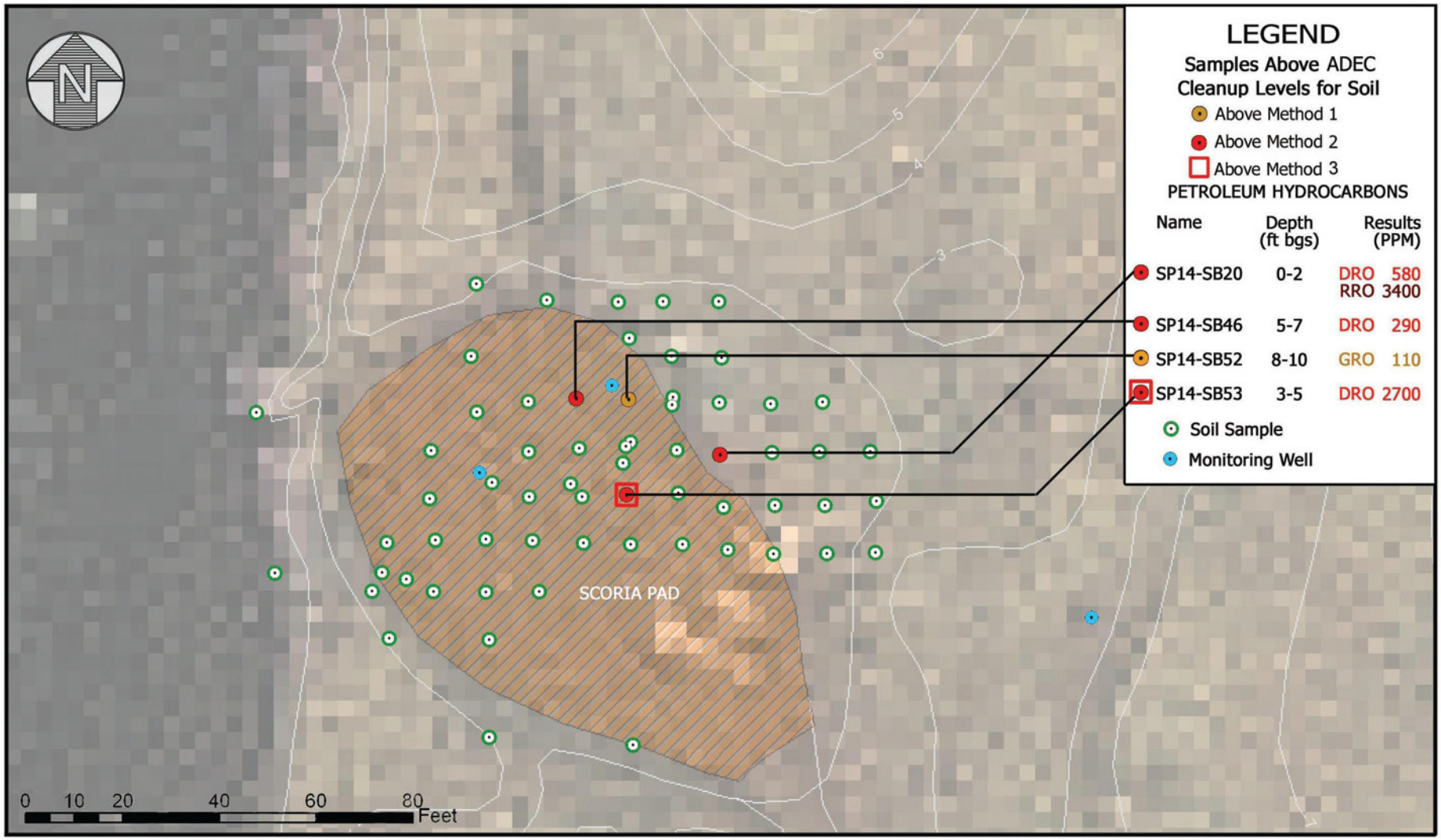


Figure 3

Historic Soil Samples
Icehouse Lake
Site 36/TPA Site 14
St. Paul Island, Alaska

Sources: Pribilof Project GIS Database, IT Alaska, Inc. (2001), CESI (2000), Ikonos Satellite Imagery (2001).

Pribilof Islands Restoration Project

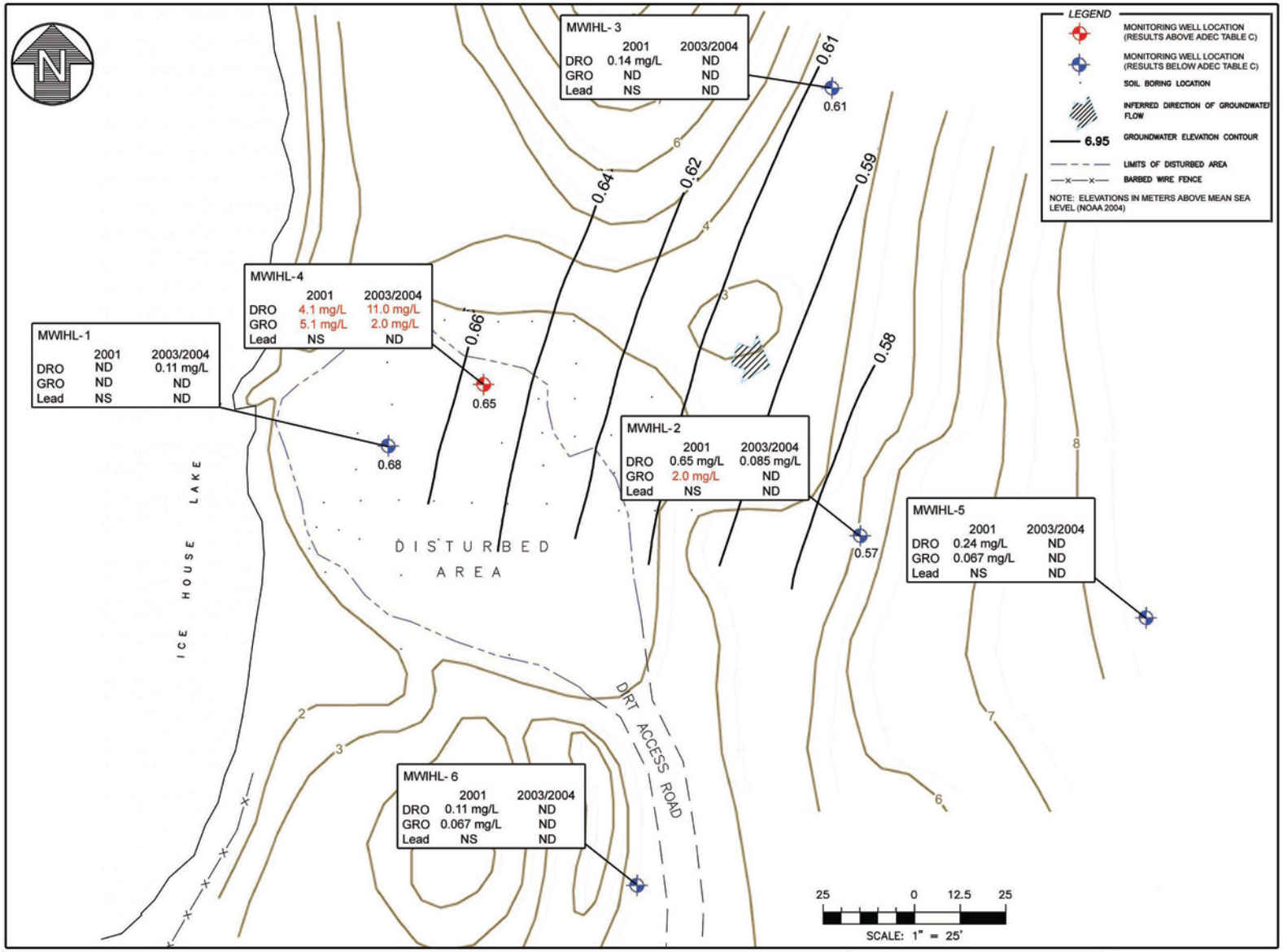
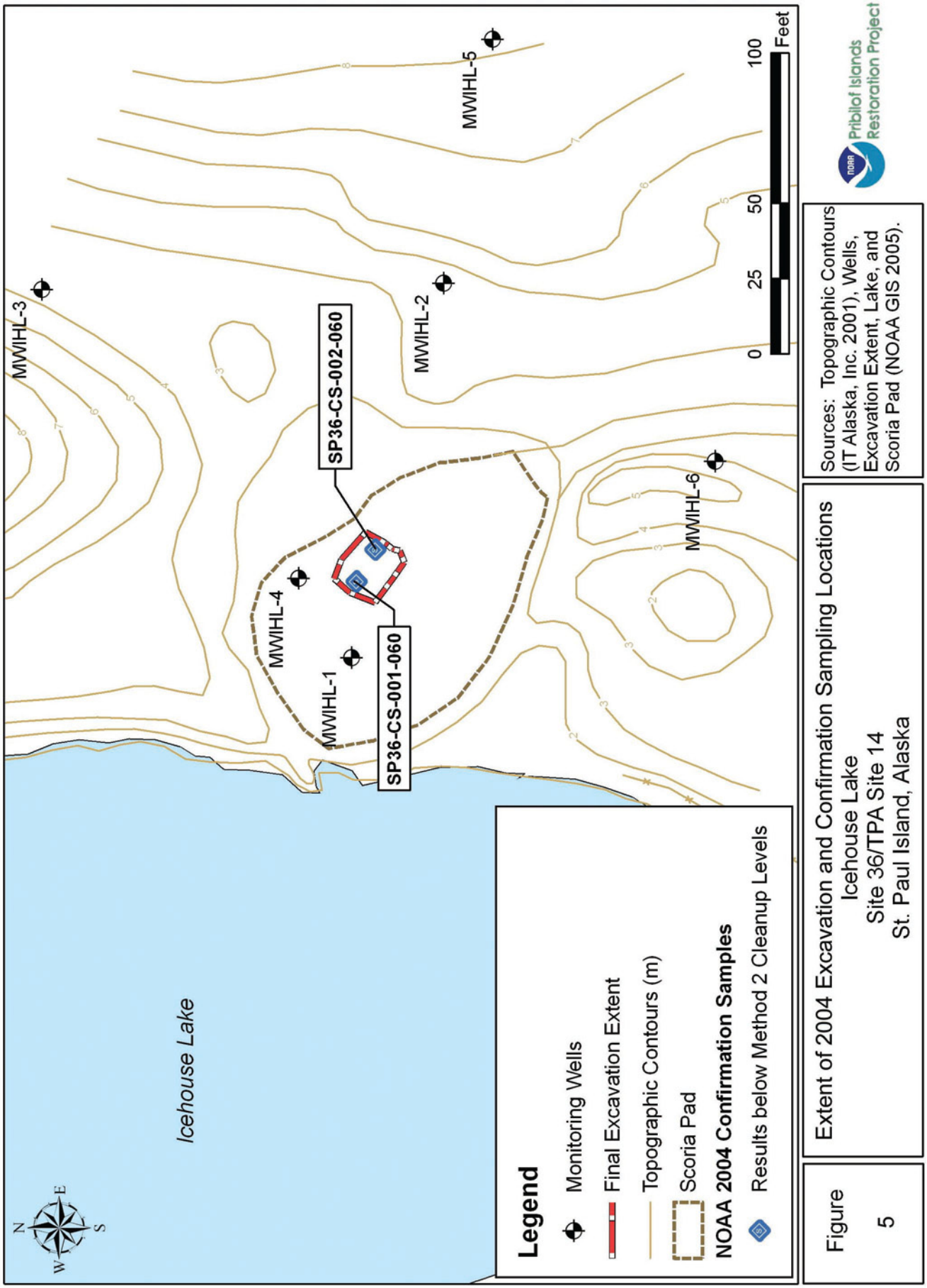


Figure 4

Monitoring Well Locations and Groundwater Contour Map
Icehouse Lake
Site 36/TPA Site 14
St. Paul Island, Alaska

Sources: Spatial data (IT Alaska, Inc, 2001), Well Results (NOAA 2005).

Pribilof Islands Restoration Project


Icehouse Lake
MWIHL-1
MWIHL-2
MWIHL-3
MWIHL-4
MWIHL-5
MWIHL-6
SP36-CS-001-060
SP36-CS-002-060
N
E
S
W
0
25
50
100
Feet
Legend
Monitoring Wells
Final Excavation Extent
Topographic Contours (m)
Scoria Pad
NOAA 2004 Confirmation Samples
Results below Method 2 Cleanup Levels
Sources: Topographic Contours (IT Alaska, Inc. 2001), Wells, Excavation Extent, Lake, and Scoria Pad (NOAA GIS 2005).
Pribilof Islands Restoration Project
Extent of 2004 Excavation and Confirmation Sampling Locations
Icehouse Lake
Site 36/TPA Site 14
St. Paul Island, Alaska
Figure
5

A L A S K A

2008-000213-0

Recording Dist: 305 - Aleutian Islands
5/1/2008 2:25 PM Pages: 1 of 6

NOTICE OF ENVIRONMENTAL CLEANUP AND GROUNDWATER CONTAMINATION AT TPA14, ICEHOUSE LAKE, ST. PAUL ISLAND, ALASKA

Pursuant to 18 AAC 75.375, Tanadgusix Corporation and The Aleut Corporation, as the owners, and the U.S. Department of Commerce/National Oceanic and Atmospheric Administration (NOAA), as the operator of the subject property hereby provide public notice that the property located on the east shore of Icehouse Lake, St. Paul Island, Alaska 99660 has groundwater contamination. More specifically, the property is described as follows, Township 35 South, Range 131 West, Section 19 of the Seward Meridian, Alaska, Pat. No. 50-90-0669 Tanadgusix Corp., and is located at 57° 8' 25.28" North Latitude; 170°16' 6.38" West Longitude (Figures 1 and 2) has been subjected to petroleum contaminated soil and lead contaminated groundwater, as a result of a discharge, or release and subsequent cleanup of oil or other hazardous substances, regulated under 18 AAC 75, Article 3 as amended October 2005. If contaminated soil or solid wastes are exposed in the future they must be managed in accordance with laws applicable at that time. These releases and cleanup are documented in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database under site number *CS Reckey* # 1994250119606; File ID 2644.38.029.

The Icehouse Lake Site was identified as the *Icehouse Lake Buried Vehicle Boneyard Site 14* pursuant to the *Pribilof Islands Environmental Restoration Two Party Agreement* (TPA) between the State of Alaska and NOAA (NOAA 1996). NOAA addressed the Icehouse Lake Site as TPA Site 14 and NOAA Site 36. Following corrective action, NOAA submitted a request for conditional closure to the ADEC Division of Spill Prevention and Response, Contaminated Sites Program (NOAA 2005a). ADEC determined, in accordance with 18 AAC 75.325(f)(1) that site cleanup has been performed to the maximum extent practicable even though residual groundwater contamination, primarily diesel range organics, gasoline range organics, and lead existed in groundwater at the site property. ADEC granted a conditional closure, in part subject to this institutional control (deed notice), and confirmed that no further remedial action was required at the site unless new information becomes available that indicates to ADEC that the site may pose an unacceptable risk to human health, safety, welfare to the environment (NOAA 2005a).

Grantor, the US Bureau of Land Management.

Grantees:

- the Tanadgusix Corporation (grantee of the surface estate),
  4300 B Street, Suite 402
  Anchorage, AK 99503-5946

- The Aleut Corporation (grantee of the subsurface estate)
  4000 Old Seward Highway, Suite 300
  Anchorage, AK 99503

Recording District
Aleutian Islands

Remedial Actions and Residual Contamination

The Icehouse Lake Site was used by the federal government to pump drinking water to the Village of St. Paul until circa 1960. Spills or releases associated with the above ground storage tanks supporting pumping operations presumably were the source of the petroleum contaminated soils and groundwater (GW) contamination. The pumphouse was razed at an uncertain time in the past, but the ASTs and associated piping were not removed until 1997. During 2004, NOAA removed approximately seventy-two (72) cubic yards of petroleum contaminated soils, primarily diesel range organics, from the site. The site covered a surface area of less than one-half of an acre.

NOAA has several groundwater monitoring wells at the site (Figure 4), which are maintained under its long-term groundwater monitoring plan (NOAA 2005b). GW beneath the site maybe contaminated with diesel range organic and gasoline range organic compounds, and lead. Figure 3 depicts the location of GW wells (Tutka 2007), and the groundwater gradient (IT Alaska 2002 and Tetra Tech 2005). More recent groundwater monitoring sampling (2007) did not find groundwater above ADEC Table C contaminant levels for any of the previously identified contaminants of concern (Tutka 2007). However, no long term trend of uncontaminated water had been established at the time of issuance of this notice.

Site Use

In the event that information becomes available which indicates that the site may pose an unacceptable risk to human health, safety, welfare or the environment, the land owner and/or operator is required under 18 AAC 75.300 to notify ADEC and evaluate the environmental status of the contamination in accordance with applicable laws and regulations. Further site characterization and cleanup may be necessary under 18 AAC 75.325-.390 and 18 AAC 78.600. Also, any transport, treatment, or disposal of any potentially contaminated soil or water from the site or use of the groundwater at or near the contaminated area requires notification to and approval from the Department in accordance with 18 AAC 75.370(b) and 18 AAC 78.600(h).

In the future, if contaminated soil or wastes are removed from the site it must be characterized and managed following regulations applicable at that time. Pursuant to 18 AAC 75.325(i)(1) and (2) 18 AAC 75.370. ADEC approval is required prior to moving soil or groundwater that is, or has been, subject to the cleanup rules found at 18 AAC 75.325-.390.

This notice remains in effect until a written determination from ADEC is recorded that states that soil and/or groundwater at the site has been shown to meet the most stringent soil cleanup levels in Method Two of 18 AAC 75.341(c) and/or groundwater meets the cleanup levels in Table C in 18 AAC 75.345, and that off-site transportation of soil and/or groundwater is not a concern.

References:

IT Alaska Corporation. 2002. Draft Annual Groundwater Monitoring Report 2001, St. Paul Island, Alaska. March.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26.

NOAA. 2005a. *Request for Conditional Closure at Icehouse Lake, NOAA Site 36/TPA Site 14, St. Paul Island, Alaska.* Signed by John Lindsay (NOAA) and submitted June 22. Signed by Louis Howard of ADEC Contaminated Sites Program, July 6.

NOAA. 2005b. *Final Long Term Groundwater Monitoring Plan, St. Paul Island, Alaska.* Prepared by National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115. August 29.

Tetra Tech. 2005. *Final Site Characterization Report, Icehouse Lake (Site 36/TPA Site 14), St. Paul Island, Pribilof Islands, Alaska.* Prepared for National Oceanic and Atmospheric Administration, Pribilof Project Office, 7600 Sand Point Way NE, Seattle, WA. 98115. May 26.

Tutka. 2007. *Annual Groundwater Monitoring Report 2007, St. Paul Island, Alaska.* December 21. Prepared for NOAA, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115.

Please return original copy of this notice to the (operator) address below:

Signature: _____

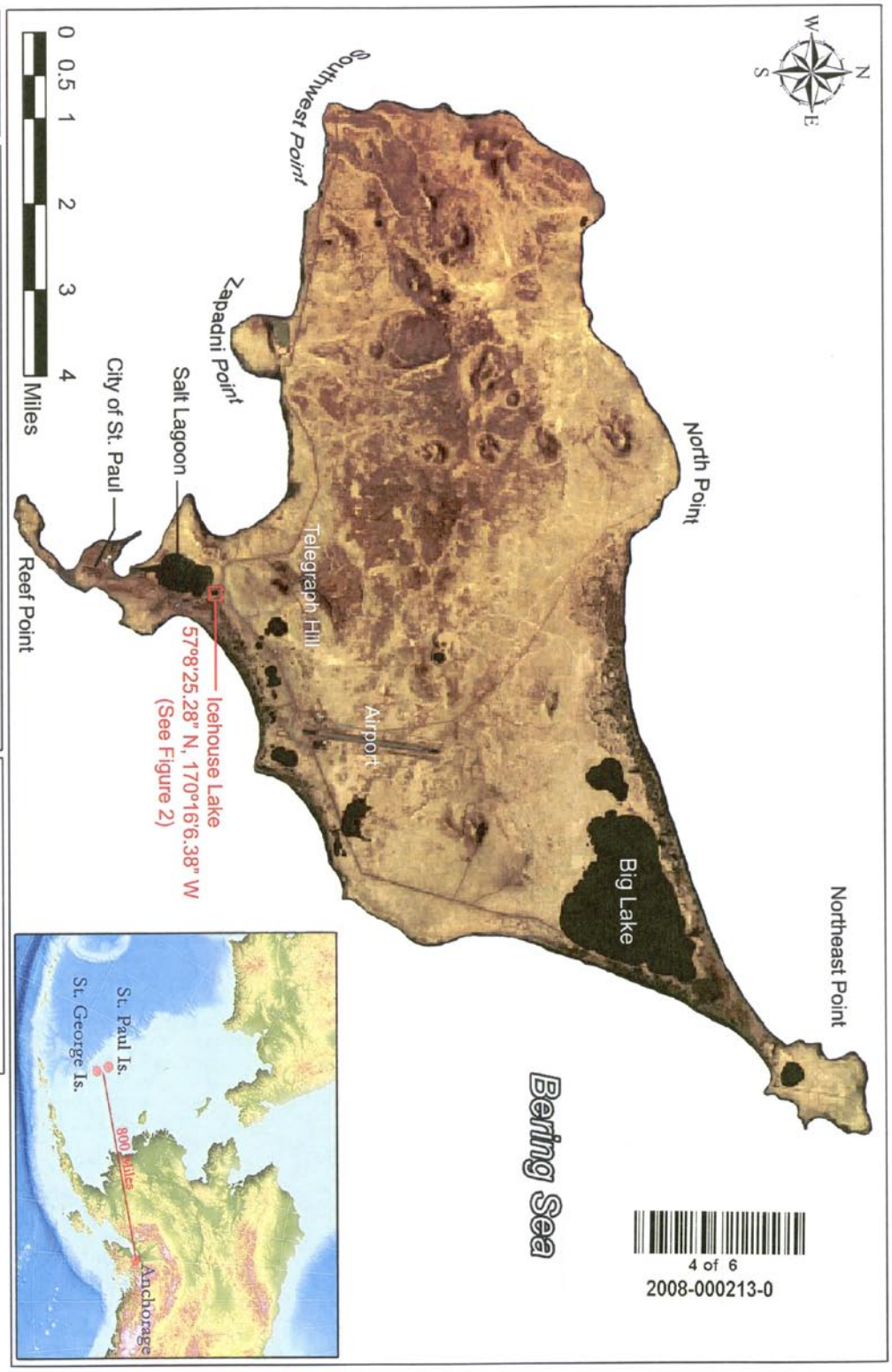
Printed Name: JOHN A. LINDSAY

Mailing Address:
Attn: John Lindsay

US DOC, NOAA, NOS, OR&R, PPO
7600 Sand Point Way NE
Bldg 3, RM 1301
Seattle, WA 98115

(seal) Subscribed and sworn to before me this ___ day of _____, 19___.
Notary Public in and for the State of _____
My commission expires:_____

3 of 6
2008-000213-0



4 of 6

2008-000213-0

Figure 1

St. Paul Island Vicinity Map
Icehouse Lake
NOAA Site 36/TPA Site 14
St. Paul Island, Alaska

Source: Ikonos Satellite Imagery (Space Imaging 2001)
Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 36, TPA 14\SNP Standard Fig 1 - Icehouse Lake.psd
Former Gas-Diesel Drum Storage.psd
Date: 4/14/2008

Pribilof Islands Restoration Project

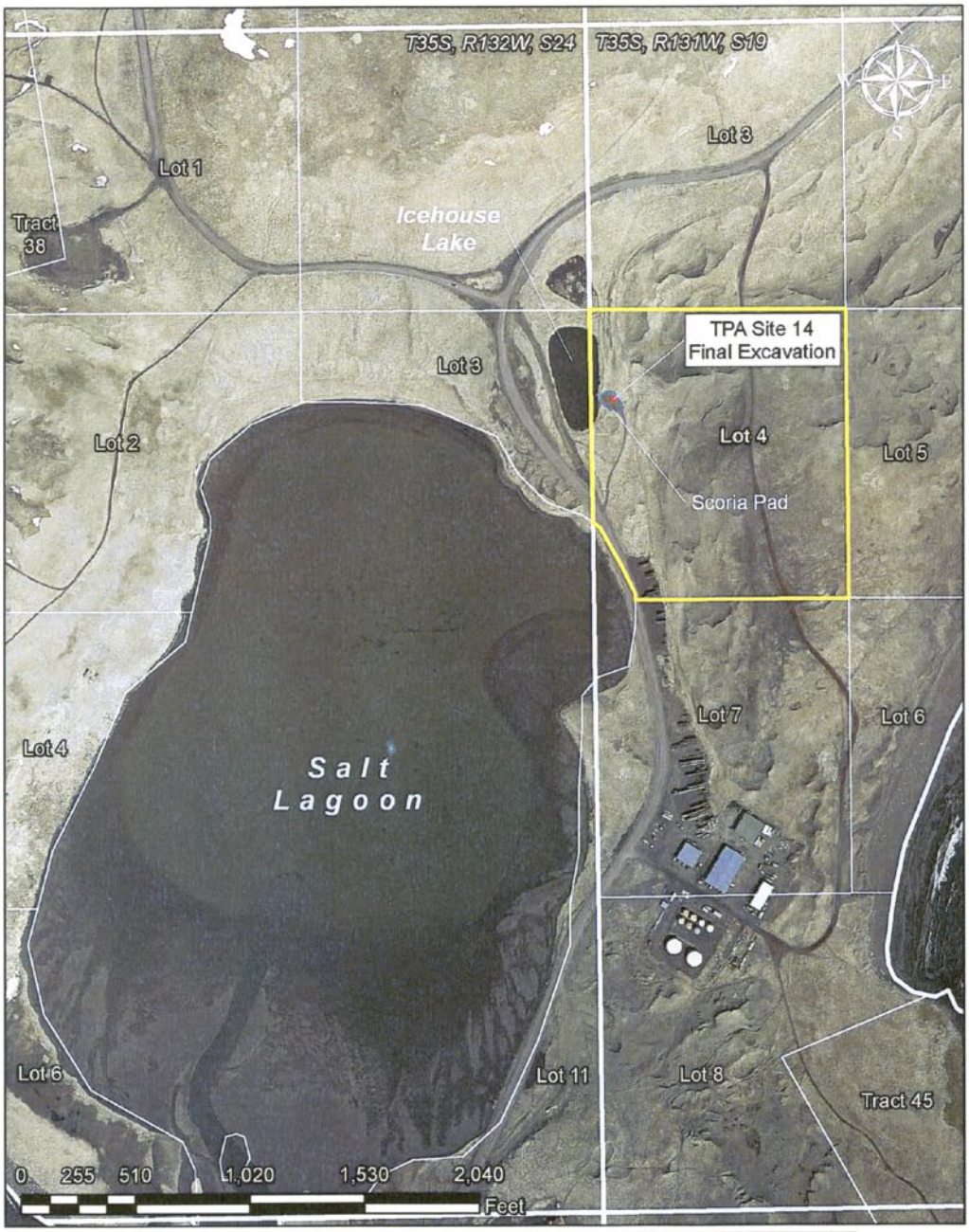


Figure 2	Legal Property Description Map Lot 4 of T35S, R131W, S19 Icehouse Lake NOAA Site 36/TPA Site 14 St. Paul Island, Alaska	Source: TPA14 Layers (NOAA Pribilof Project GIS), Aero-Metric 2006 2 ft Aerial Photo 1983 Bureau of Land Management Land Survey Plat Officially filed February 15, 1985. Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 36, TPA 14\IcehouseLake_PropDescription_Fig2.mxd Date: 4/23/2008 @ 1:23:11 PM

Pribilof Islands Restoration Project

5 of 6
2008-000213-0

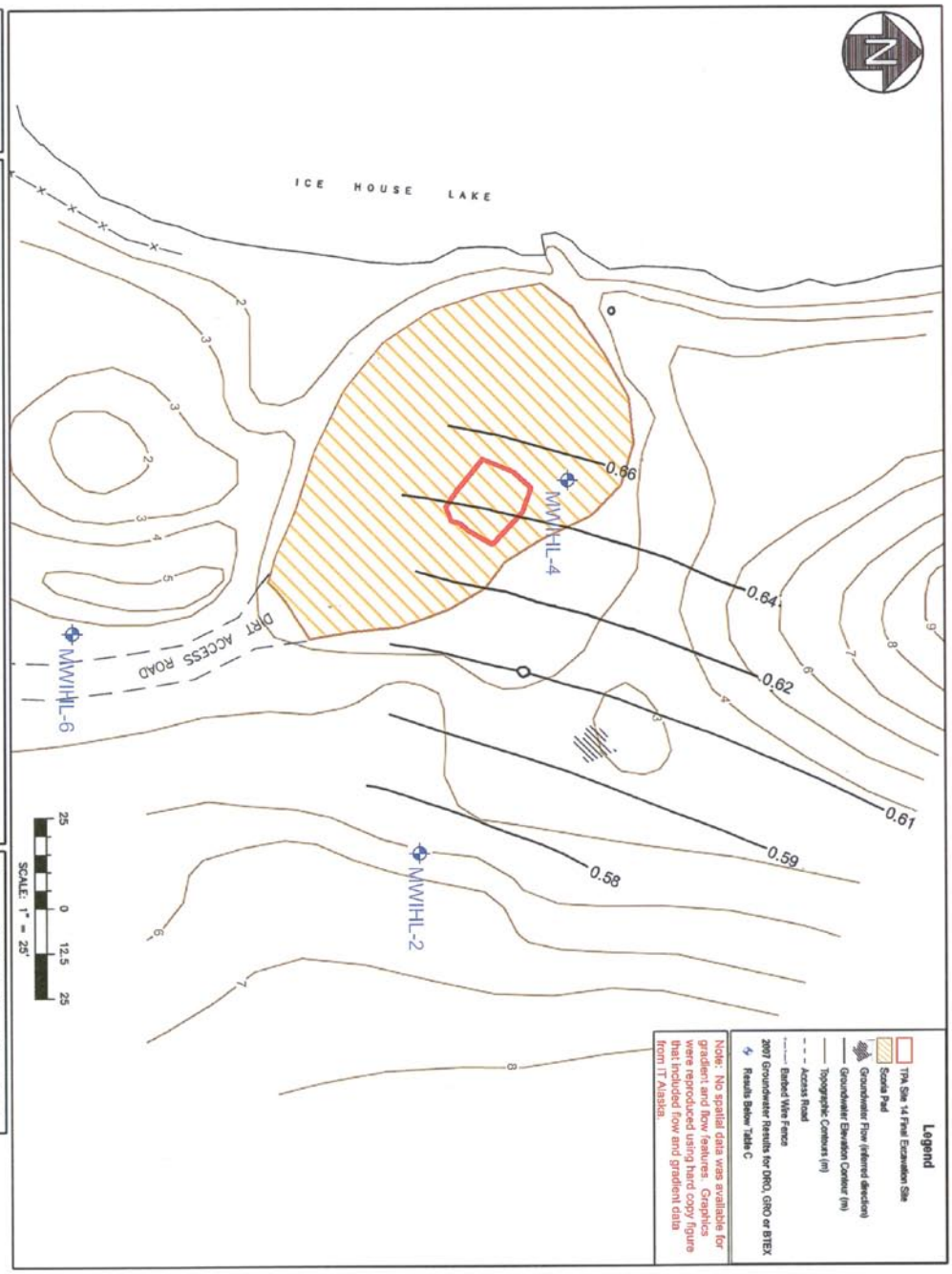


Figure 3

Location of Groundwater Wells and Gradient
Icehouse Lake
Site 36/TPA Site 14
St. Paul Island, Alaska

Sources: Gradients, Flow, Topo, Roads, Fence, (IT Alaska, Inc, 2001), Wells, Scoria Pad, Excavation (NOAA GIS)
Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 36, TPA 14\IHL GW Wells & Gradients Fig 3.psd
Date: 4/15/2008

Pribilof Islands Restoration Project

6 of 6
2008-000213-0

NOAA Site 37
TPA Site 15a: Scoria Pit – Telegraph Hill
(Scoria Pits, TPA 15; TPA Attachment A)

Final Site Characterization Report, Telegraph Hill Scoria Pit Site, Two-Party Agreement Site No. 15-1, Pribilof Islands Environmental Restoration Project, St. Paul Island, Alaska.....831

Letter from Louis Howard to John Lindsay RE: Telegraph Hill Two-Party Agreement (TPA) Site 15, St. Paul Island, Alaska July 2004. Dated August 24, 2004.....913

Letter from Louis Howard to John Lindsay RE: Telegraph Hill Two-Party Agreement (TPA) Site 15-1, St. Paul Island, Alaska. Dated Feb. 16, 2005.....915

FINAL
Site Characterization Report

Telegraph Hill Scoria Pit Site
Two-Party Agreement Site No. 15-1

Pribilof Islands Environmental Restoration Project
St. Paul Island, Alaska

December 2004

Prepared By:

National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office
7600 Sand Point Way NE
Seattle, Washington 98115

EXECUTIVE SUMMARY

This site characterization report (SCR) is intended to present a comprehensive evaluation of the status of the site known as the Telegraph Hill scoria pit on St. Paul Island, Alaska. Under Public Law No. 104-91 of 1995 and Public Law 106-562 of 2000 (Pribilofs Transition Act) the National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration is responsible for restoration activities on St. Paul Island, Alaska, which is part of a five-island archipelago known as the Pribilof Islands. The United States acquired the Pribilof Islands in 1867, when Alaska was purchased from Russia. The federal government was the sole operator and administrator of the Pribilof Islands, including northern fur seal (Callorhinus ursinus) harvesting activities, from 1910 until 1983. Petroleum and other contaminants have been identified or potentially may exist at a number of island properties currently and formerly owned and operated by NOAA. Affected properties are described in a two-party agreement (TPA) between NOAA and the Alaska Department of Environmental Conservation (ADEC) dated January 26, 1996. The TPA provides the framework for this SCR.

The Telegraph Hill scoria pit site is known by NOAA as TPA Site No. 15-1 and by the Department of Defense as Formerly Used Defense Site (FUDS) C. For purposes of this SCR, the "site" (Telegraph Hill scoria pit) refers to the area encompassing both TPA site 15-1 and FUDS C. The site is located along the northwest side of Telegraph Hill, about two miles north of the City of St. Paul. Telegraph Hill reportedly received its name from the establishment of a military telegraph station atop its summit. In the past, the site was used as an oil drum and debris disposal area. Currently, as well as historically, the site is quarried for volcanic scoria.

Since 1986, debris removals, potential source surveys, soil sampling, and groundwater monitoring well installation and sampling have been conducted at Telegraph Hill. A NOAA contractor, Columbia Environmental Sciences, Inc. (CESI), conducted a field investigation at the Telegraph Hill scoria pit site during the 2000 field season. This SCR presents the objectives, methodologies, and results of the CESI investigation, and synthesizes the results with data from prior investigations. During the 2000 field season, 15 soil samples from nine locations at the Telegraph Hill scoria pit site were collected by CESI and analyzed for petroleum hydrocarbons, metals, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs). When prior investigations are included, a total of 17 samples from 11 locations at the Telegraph Hill scoria pit site have been collected and analyzed at a fixed laboratory. CESI and IT Alaska, Inc. collected 27 groundwater samples from five monitoring wells in the vicinity of the site during 2000 and through September 2001. Based on these investigations, soil and groundwater remediation are not necessary at the Telegraph Hill scoria pit site.

The contiguous nature of some of the Department of Defense FUDS and NOAA TPA sites on the Pribilof Islands complicates cleanup issues. Under current legislation, Public Law 16-562 Section 107, NOAA is prohibited from further expending Pribilof Project funds for remediation of FUDS on the Pribilof Islands. Given this and the fact that investigations have indicated remediation is not necessary, no further remedial action should be required of NOAA.

CONTENTS

Section Page

1.0 INTRODUCTION....838
1.1 REPORT OBJECTIVES....838
1.2 REPORT ORGANIZATION....838
2.0 BACKGROUND....838
2.1 ISLAND HISTORICAL INFORMATION....838
2.2 ISLAND ENVIRONMENTAL SETTING....839
2.2.1 Climate....839
2.2.2 Geography....839
2.2.3 Geology and Hydrogeology....840
2.2.4 Surface Water Resources....840
2.2.5 Groundwater Resources....840
2.2.6 Flora....840
2.2.7 Fauna....841
2.3 SITE DESCRIPTION....842
2.3.1 Site History....842
2.3.2 Soil and Geology....842
2.3.3 Surface Water....842
2.3.4 Groundwater....842
2.3.5 Site Contamination....842
2.4 CONCEPTUAL SITE MODEL....842
2.4.1 Source and Mechanism of Chemical Release....843
2.4.2 Affected Environmental Medium and Potential Chemical Migration Process....843
2.4.3 Exposure Points....843
2.4.4 Receptors and Exposure Routes....843
3.0 PREVIOUS INVESTIGATIONS AND OTHER ACTIVITIES....844
3.1 DEBRIS REMOVAL (1986)....844
3.2 PRELIMINARY ASSESSMENT (1992)....844
3.3 DEBRIS REMOVAL (1997)....844
3.4 CLOSURE CONFIRMATION (1999)....844
3.4.1 Debris Survey....844
3.4.2 Soil Characterization....845
3.5 SITE CLOSURE (2000)....846
3.5.1 Debris Removal....846
3.5.2 Soil Characterization....847
3.5.3 Groundwater Characterization....847
3.6 GROUNDWATER MONITORING (2001)....847
4.0 FIELD METHODOLOGIES FOR SITE CHARACTERIZATION....847
4.1 GEOPHYSICAL METHODS....847

4.2 SOIL SAMPLING METHODS 847
4.2.1 Mobile Hollow Stem Auger Borings 848
4.2.2 Air Rotary Borings 848
4.2.3 Soil Decontamination Procedures 848
4.2.4 Soil Investigation-Derived Waste 849
4.2.5 Field Analytical Methods 849
4.3 GROUNDWATER METHODS 850
4.3.1 Monitoring Well Construction 850
4.3.2 Monitoring Well Development 850
4.3.3 Water Level Measurements 850
4.3.4 Groundwater Sampling 850
4.3.5 Water Decontamination Procedures 851
4.3.6 Water Investigation-Derived Waste 851
4.4 SURVEYING METHODS 851
4.4.1 GPS Mapping 851
4.4.2 Optical Leveling 851
4.5 SAMPLE HANDLING, PACKAGING, AND SHIPPING 851
5.0 RESULTS OF 2000 SITE CHARACTERIZATION ACTIVITIES 852
5.1 DATA QUALITY 852
5.2 POTENTIAL SOURCE SURVEY 852
5.3 SOIL CHARACTERIZATION 852
5.4 GROUNDWATER CHARACTERIZATION 853
5.4.1 Groundwater Contamination 853
5.4.2 Hydrogeology 855
6.0 SYNTHESIS AND EVALUATION OF DATA FOR SITE CHARACTERIZATION 855
6.1 REGULATORY LEVELS FOR SCREENING PURPOSES 855
6.2 DATA QUALITY 857
6.3 BACKGROUND CONCENTRATIONS 857
6.4 NATURE AND EXTENT OF SOIL CONTAMINATION 857
6.5 NATURE AND EXTENT OF GROUNDWATER CONTAMINATION 858
6.6 REVISIONS TO THE CONCEPTUAL SITE MODEL 859
7.0 SITE CHARACTERIZATION SUMMARY AND CONCLUSIONS 859
8.0 DISCUSSION OF REMAINING DEBRIS AND ASSOCIATED CLEANUP RESPONSIBILITY 860
9.0 FINDINGS AND RECOMMENDATIONS 861
10.0 REFERENCES 861

Appendix

A Project Photography
B Analytical Data
C Soil Boring Logs
D Wellhead Elevations
E Water Level Measurements
F GPS Data
G Data Quality Evaluation Report
H Correspondence Regarding TPA Site No. 15-1/FUDS C
I Chase Construction Daily Quality Control Inspection Reports
J ADEC's Comments on NOAA's July 2004 Draft Site Characterization Report for the Telegraph Hill Scoria Pit Site

TABLES

Page

Table 1. Conceptual Site Model for Telegraph Hill Scoria Pit Site 820
Table 2. Soil Analytical Lab Results Above ADEC Method Two Regulatory Limits, Telegraph Hill, St. Paul, Alaska 822
Table 3. Groundwater Analytical Lab Results Above ADEC Table C Regulatory Limits, Telegraph Hill, St. Paul, Alaska 830
Table 4. Cleanup Levels for Select Petroleum-related Compounds in Soil, ADEC (2003) Method Two Tables B1 and B2 832
Table 5. Cleanup Levels for Select Petroleum-related Compounds in Groundwater, ADEC (2003) Table C 832
Table 6. Statistical Results of St. Paul Island, Alaska Soil Metal Background Concentration Studies 833

FIGURES

Figure 1. St. Paul Island Vicinity Map, Telegraph Hill, TPA Site 15-1, St. Paul Island, Alaska. 840
Figure 2. Map of the Telegraph Hill Scoria Pit Site (TPA Site No. 15-1) showing NOAA property (Tract 37), the scoria pit perimeter, drum excavation areas, potential debris fields, and the location of the site relative to drinking water wells. 841
Figure 3. Soil sampling locations at Telegraph Hill Scoria Pit Site (TPA Site No. 15-1). Location 15SS01 indicated in red had DRO detected in 1999 above Method 2 regulatory limit in 1999. 842
Figure 4. Map of Telegraph Hill Scoria Pit Site (TPA Site No. 15-1) showing the Central, Upper, and Upper-Upper Pads. 843
Figure 5. Groundwater sampling locations at Telegraph Hill Scoria Pit Site (TPA Site No. 15-1). 844
Figure 6. St. Paul Island Vicinity Map, Telegraph Hill and the Oil Drum Dump Site, St. Paul Island, Alaska. ... 845

ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ADT	Alaska Daylight Time
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
CBSFA	Central Bering Sea Fisherman's Association
CESI	Columbia Environmental Sciences, Inc.
Chase	Chase Construction, Inc.
DPP	Decommissioned Power Plant
DQI	Data quality indicators
DQO	Data quality objective
DOD	Department of Defense
DRO	Diesel range organics
E&E	Ecology and Environment, Inc.
EPA	U.S. Environmental Protection Agency
ETC	Enhanced thermal conduction
F&BI	Friedman & Bruya, Inc.
FUDS	Formerly used defense site
GIS	Geographic information system
GPS	Global positioning system
GRO	Gasoline range organics
IDW	Investigation-derived waste
ICP	Inductively coupled plasma
IT	IT Alaska, Inc.
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
µg/L	Microgram per liter
mg/kg	Milligram per kilogram
mph	Miles per hour
MS	Matrix spike
MSD	Matrix spike duplicate
MWTH	Monitoring well-Telegraph Hill
NCDC	National Climatic Data Center
NFA	No Further Action
NOAA	National Oceanic and Atmospheric Administration
Nortech	Nortech Environmental and Engineering Consultants
NWS	National Weather Service
PAH	Polynuclear aromatic hydrocarbons
PID	Photo-ionization detector
PPE	Personal protective equipment
PQL	Practical quantitation limit
PVC	Polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RPS	Relative percent difference

RRO Residual range organics
SBTH Soil boring-Telegraph Hill
SCR Site characterization report
SDG Sample delivery group
SVOC Semivolatile organic compound
TDX Tanadgusix
Tetra Tech Tetra Tech EM Inc.
TOC Total organic carbon
TPA Two-Party Agreement
TPH Total petroleum hydrocarbons
USACE U.S. Army Corp of Engineers
VOA Volatile organic analysis
VOC Volatile organic compound
Woodward-Clyde Woodward-Clyde Consultants, Inc.

1.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration is responsible for restoration activities at St. Paul Island, Alaska, which is part of a five-island archipelago known as the Pribilof Islands (Figure 1). Petroleum and other contaminants have been identified or potentially may exist at a number of island properties currently and formerly owned and operated by NOAA. Affected properties are described in a two-party agreement (TPA) between NOAA and the Alaska Department of Environmental Conservation (ADEC) dated January 26, 1996 (NOAA 1996). NOAA is conducting site characterization, remediation, and restoration in accordance with the TPA and State of Alaska regulations. Public Law No. 104-91 and Public Law No. 106-562 of 2000 (Pribilof Transition Act) provide the mandate for these activities.

Among the sites identified for action under the TPA is TPA Site No. 15-1, also known as the Telegraph Hill scoria pit site. For purposes of this site characterization report (SCR), the Telegraph Hill scoria pit site refers to the area encompassing not only TPA Site No.15-1 but also the Formerly Used Defense Site (FUDS) C. This site has been used as a quarry/borrow pit; an oil drum, waste oil, and debris disposal site; and, purportedly, a telegraph station. The current use of the site is as an occasional source of scoria. Since 1986, debris removals, potential source surveys, soil sampling, and groundwater monitoring well installation and sampling have been conducted at Telegraph Hill.

This SCR presents the methodologies and results of site characterization activities performed by Columbia Environmental Sciences, Inc. (CESI), under contract to NOAA, at the Telegraph Hill scoria pit site during 2000 and 2001. Data from other investigations are also summarized and synthesized as part of this SCR.

1.1 REPORT OBJECTIVES

The overall objective of this site characterization report is to present information pertinent to a No Further Action (NFA) designation decision. This report reviews fieldwork that has been conducted, summarizes and evaluates available data, and discusses the division of site cleanup responsibility between the Department of Defense (DOD) and NOAA. It is intended to 1) take a comprehensive look at previous investigations and activities, 2) present information on the site's current status, and 3) make recommendations on the future of the site.

1.2 REPORT ORGANIZATION

In addition to this introduction, this report includes background information (Section 2), a summary of previous investigations and other activities at the site (Section 3), field methodologies (Section 4), results of 2000 site characterization activities (Section 5), a synthesis and evaluation of data for site characterization (Section 6), site characterization summary and conclusions (Section 7); a discussion of remaining debris and associated liability (Section 8), findings and recommendations (Section 9), and references (Section 10). Appendices to the report (A-J) include project photography, analytical data, soil boring logs, wellhead elevations, water level measurements, global positioning system (GPS) data, a Data Quality Evaluation Report, and daily logs and correspondence regarding TPA Site No. 15-1/FUDS C.

2.0 BACKGROUND

This section provides a brief discussion of the location and history of the Pribilof Islands, environmental conditions on St. Paul Island, and a description of the site.

2.1 ISLAND HISTORICAL INFORMATION

Russia first discovered St. Paul Island in 1786. During the 1820s, Russia established a settlement on St. Paul Island to support northern fur seal harvesting operations. When the United States purchased Alaska from Russia in 1867, the Pribilof Islands were acquired. The islands became a federal reservation in 1869. From 1867 to 1910, the United States contracted seal harvesting and pelt processing on the islands to private companies. Then from

1910 to 1983, the federal government was the sole operator and administrator of the Pribilof Islands. In 1971, the Alaska Native Claims Settlement Act provided for the gradual transfer of property and management of the islands to Alaskan Native corporations, and St. Paul was incorporated in June of that year (Torrey 1978).

Major landowners on St. Paul Island are the Tanadgusix Corporation and the federal government. The federal government currently retains title to 1,515 acres on St. Paul Island, consisting primarily of seal rookeries managed by the National Marine Fisheries Service, bird rookeries managed by the U.S. Fish and Wildlife Service, a U.S. Coast Guard station, and a National Weather Service (NWS) station. The island's airport, consisting of about 67 acres, was conveyed to the State of Alaska in 1989.

2.2 ISLAND ENVIRONMENTAL SETTING

St. Paul Island is located between latitude 57°06' and 57°15' north and longitude 170°05' and 170°25' west in the Bering Sea, about 800 miles west-southwest of Anchorage and 250 miles north-northwest of Dutch Harbor, Alaska (Figure 1). The island is about 44 square miles in area.

The City of St. Paul is located on the island's southern peninsula. Its 2000 population included 532 people (Alaska Department of Labor, 2000 census). St. Paul Harbor, which opened in 1990, is reported to be one of Alaska's most important commercial fishery processing and supply ports (CBSFA undated).

The following subsections discuss the island's climate, geography, geology and hydrogeology, surface water resources, groundwater resources, flora, and fauna.

2.2.1 Climate

The climate at St. Paul Island is classified as subpolar. Maritime weather conditions prevail, with predominantly cloudy, foggy, and windy conditions.

According to the National Climatic Data Center (NCDC) (NCDC 2000), the average annual precipitation for the 30-year period ending in 1998 was 23.32 inches. Average monthly precipitation ranges from a low of 1.22 inches in March to a high of 2.81 inches in October (NCDC 2000). According to NWS, the maximum daily rainfall ever recorded on St. Paul Island is 1.93 inches, recorded on October 6, 1949. The maximum annual precipitation ever recorded on the island is 36.61 inches, recorded in 1964 (NWS 2000).

Average monthly snowfall (including ice pellets and sleet) ranges from none in the summer months of July and August to a maximum of 11.6 inches in January (NCDC 2000). NWS reports that the maximum daily snowfall ever recorded on the island is 13.8 inches, recorded on January 30, 1964. That same year experienced the maximum annual snowfall ever recorded on St. Paul Island—158.6 inches (NWS 2000).

The mean monthly temperature at St. Paul Island ranges from 22.4 °F in February to 47.7°F in August. The annual mean temperature is 34.7 F (NCDC 2000). Based on 82 years—1917 through 1999—of meteorological data available for St. Paul Island, temperature extremes include a low of –26 °F and a high of 66 °F.

The Pribilof Islands are quite windy because of their location in the Bering Sea. The average monthly wind speed ranges from a low of 12.2 miles per hour (mph) in July to 20.6 mph in December (NCDC 2000). Although calm days are recorded, storms are not uncommon on St. Paul Island, and gale-force winds are recorded fairly often, especially during the winter months. The fastest sustained wind ever recorded on the island was 84 mph, recorded in November 1990 (NWS 2000).

2.2.2 Geography

The terrain on St. Paul Island is quite diverse, consisting of diverse and rocky uplands, rugged hills, and smooth volcanic cones that fade into the sea; into broad expanses of wet, flat tundra; or into dry, drifting sand dunes. Forty-two miles of shoreline surround the island. High bedrock cliffs, low bluffs, and rock platforms predominantly characterize the southern and western shorelines. Boulder beaches and basalt shelves often are present at the base of cliffs and bluffs. The shoreline along the island's northern and eastern sides consists primarily of sandy beaches; some gravel and rocky beaches also are present. The St. Paul Harbor is protected by breakwater structures, affording the harbor and Salt Lagoon some protection from the harsh Bering Sea environment (Elliot 1976; NOAA and USCG 1998).

2.2.3 Geology and Hydrogeology

The Bering Sea is a triangular basin between Alaska and Siberia; it is bounded to the south by the Aleutian Island chain. The Pribilof Islands are situated within the basin near the edge of the Bering Sea shelf, a notably flat and shallow (100 fathoms or less) feature in the northeastern part of the basin. The Pribilof Islands area was built up by large fissure volcanic eruptions that occurred in the late Pleistocene (from about 2.1 million to 3,200 years ago). The geology of the Pribilof Islands consists of lava flows and sills, with lesser amounts of pyroclastic (explosive volcanic ejecta) and tuffaceous (fine-grained volcanic fragments, particularly ash) material, as well as glacial deposits (Barth 1956).

The bedrock geology of St. Paul Island consists primarily of basaltic lava flows and sills. A majority of the flows and sills are porphyritic (containing larger crystals, or phenocrysts in a fine-grained matrix), with primarily olivine phenocryts and a very fine-grained groundmass of augite, plagioclase, olivine, magnetite and glass. No trace of glaciation is observed on the surface of St. Paul Island. However, glacial sediments have been noted to occur between lava flows and sills in many locations on the island, indicating glaciation between periods of volcanic activity. The most prominent topographic landmarks on the island are relict features related to pyroclastic events, including Bogoslof Hill, a volcanic cone, and Crater Hill, an explosion crater (Barth 1956).

Surface geology consists of weathered volcanic materials and recently formed alluvial sediments composed primarily of sand. Sand covers about one-seventh of the island (Barth 1956).

At St. Paul Island, groundwater is contained and transmitted within fractures in the volcanic rocks. The absence of streams on the island suggests rapid infiltration of rainwater and snowmelt and implies relatively high permeabilities and porosities in subsurface materials. In the central, upland portion of the island, groundwater occurs in fractured basalt aquifers that are the drinking water resource used on the island (Woodward-Clyde 1994). Groundwater also occurs in the unconsolidated materials on the island. However, because of their low elevation and proximity to the coast, these shallow, localized aquifers may contain nonpotable water, especially toward the sea. In addition, it is unlikely that aquifers in the unconsolidated deposits could provide a sustainable municipal drinking water source, because significant pumping most likely would induce saltwater intrusion.

Depth to groundwater in the regional, fractured basalt aquifer occurs at depths between 38 and 80 feet below ground surface (bgs), based on measurements made in the municipal supply wells. Groundwater elevations range from about 1 to 3 feet above mean sea level (Dames and Moore 1999). The aquifer's transmissivity is estimated at 0.1 to 2.5 million gallons of water per day per foot (URS Corp. 1987, Munter and Allely 1994). Based on the island's topography, regional groundwater flow is most likely radial from the central, upland part of the island (groundwater recharge area) toward the coast (groundwater discharge area). Based on geologic conditions, locally differing groundwater flow directions also may exist.

2.2.4 Surface Water Resources

No streams exist at St. Paul Island. Surface water on the island generally is contained in small, shallow lakes. Big Lake and Sheep Lake are the two largest lakes on the island and are located in the northeastern part of the island. Smaller lakes are situated near the southeastern coast of the island and typically are located nearer to the shoreline than the interior.

2.2.5 Groundwater Resources

The City of St. Paul obtains its water supply from seven municipal wells that are located northeast of Telegraph Hill and about 1.5 miles northeast of the city. The municipal water supply wells are completed within the regional fractured basalt aquifer. Groundwater is pumped from the wells by pipelines to three 200,000-gallon aboveground water storage tanks located on a hill west of the city. The water is treated with chlorine and fluoride prior to distribution.

2.2.6 Flora

The habitat at St. Paul Island is broadly classified as moist tundra (USDA 1972). The island consists of two major geophysical provinces, including the sand dunes most common on the northern and eastern portions of the island, as well as the rocky tundra common throughout most of the remainder of the island. Much of the island contains

a variety of grasses, forbs, berries, and low trees that grow prostrate, rarely exceeding 2 to 3 inches in height. Common species include arctic lupine (*Lupinus arcticus*), creeping willow (*Salix* spp.), and nagoonberry (*Rubus arcticus*), a close relative of salmonberry and raspberry.

2.2.7 Fauna

The Pribilof Islands are considered to be one of the most environmentally sensitive areas in North America, providing a near-pristine environment for a great number of birds and sea mammals that migrate thousands of miles to breed, nest, and raise their young over the summer and fall months.

Marine Mammals. The Pribilof Islands are perhaps best known for the large population of northern fur seals (*Callorhinus ursinus*) that crowd the beach rookeries each summer. The present population at St. Paul Island and adjacent Sea Lion Rock is estimated at 700,000 to 800,000 individuals, the largest concentration in North America (Murie and Scheffer 1959; NOAA and USCG 1998). Other marine mammals found more rarely in waters and near shore areas of the Pribilof Islands include the Pacific walrus (*Odobenus rosmarus*) and harbor seal (*Phoca vitulina*). The Steller sea lion (*Eumetopias jubatus*), a Federally- and State-designated endangered species, also can be found in the near-shore environment at St. Paul Island.

In addition to these smaller mammals that occasionally haul out on the land, several whale species visit the islands occasionally, including the orca (*Grampus rectipinna*), gray (*Eschrichtius glaucus*), and minke (*Balaenoptera acutorostrata*). Whales may pass by the islands during migration periods or during their summer residence in the North Pacific Ocean or Bering Sea (NOAA and USCG 1998).

During the winter months, pack ice occasionally extends into the Pribilof Islands. During these occurrences, several other mammals may be found in the pack ice or along the ice front, including the bearded seal (*Erignathus barbatus*), ringed seal (*Pusa hispida*), ribbon seal (*Histriophoca fasciata*), and bowhead whale (*Balaena mysticetus*). The bowhead whale is a Federally-designated threatened species (NOAA and USCG 1998).

Land Mammals. Few land mammals exist on St. Paul Island. Native to the island are the arctic fox (*Alopex lagopus*) and the Pribilof shrew (*Sorex pribilofensis*), which is considered to be a species of special concern (NOAA and USCG 1998). Reindeer (*Rangifer* sp.) have been introduced to the island, and a herd numbering in the hundreds currently resides on St. Paul Island.

Birds. The Pribilof Islands are seasonal home to several million birds. Murres (*Uria* spp.) have the largest population numbers, followed by auklets, including the parakeet auklet (*Cyclorrhynchus psittacula*), crested auklet (*Aethia cristatella*), and least auklet (*A. pusilla*). A number of pelagic bird species also inhabit St. Paul Island, including the kittiwakes (*Rissa* spp.), fulmar (*Fulmarus* spp.), and tufted and horned puffin (*Fratercula cirrhata* and *F. corniculata*, respectively).

In addition, substantial seasonal populations of shorebirds inhabit St. Paul Island, including turnstones (*Arenaria* spp.), phalaropes (*Phalaropus* spp.), and other sandpipers of the family *Scolopacidae*. A number of waterfowl overwinter on the Pribilof Islands as well.

Most of the marine birds found on the islands generally forage throughout the surrounding waters. However, harlequin ducks (*Histrionicus histrionicus*) generally are found in waters closer to shore. Most species migrate to the islands for breeding during May or June. Murres, auklets, puffins, kittiwakes, fulmars, and cormorants (family *Phalacrocoracidae*) nest in or at the base of the high cliffs surrounding the southern and western portions of St. Paul Island (NOAA and USCG 1998).

Fish and Shellfish. Large fish populations support the enormous numbers of birds and marine mammals found at the Pribilof Islands. No streams or rivers are located on St. Paul Island, so local anadromous fisheries are not supported. Only a single species of stickleback represents freshwater fishes in several lakes on St. Paul Island. A variety of important saltwater fish spawn in the waters surrounding the islands from February to June, including the Pacific cod (*Gadus macrocephalus*), walleye pollock (*Theragra chalcogramma*), and Pacific halibut (*Hippoglossus stenolepis*) (NOAA and USCG 1998).

The islands are near major shellfish harvesting areas. Several species of crab occur nearby, including the red, blue, and brown king (*Paralithodes* spp.) and snow (*Chionoectes* sp.). Although all species are present year-

round, the duration of the commercial crab-harvesting season is limited for all species except the brown king crab. Crab spawning and hatching occurs primarily between January and June (NOAA and USCG 1998).

Local fisheries are vital to the economy of St. Paul Island; the island is located within 65 miles of the nation's largest commercial fishing grounds. The halibut fishery alone is a major source of employment and income for the residents of St. Paul Island, providing crew and baiting jobs for more than 130 people in the summer months. According to the Central Bering Sea Fisherman's Association (CBSFA), the 1999 halibut fishery was expected to contribute at least $1.25 million to the local economy (CBSFA 1998). Other fisheries that historically have contributed to the local economy include pacific cod, sea snails, snow crab, and red and blue king crab (CBSFA undated).

2.3 SITE DESCRIPTION

The Telegraph Hill scoria pit is classified as a petroleum and hazardous substance contamination site under the TPA. It is actively mined for scoriaceous gravel that is used by various on-island entities as road base and for other purposes. The site is located along the northwest side of Telegraph Hill, about 2 miles north of the City of St. Paul (Figures 1).

2.3.1 Site History

Telegraph Hill purportedly received its name from the establishment of a military telegraph station atop its summit. This telegraph station was supposedly the same facility where detonation controls were established in 1942 by the U.S. Army for command detonation of the village facilities, structures, and buildings in the event of an Imperial Japanese armed forces invasion of St. Paul Island. DOD and other island entities later used Telegraph Hill as an oil drum, waste oil, and debris disposal site. Currently, as well as historically, the site is quarried for volcanic scoria. Under the FUDS Program, DOD identified this site as FUDS C in 1985 [DOD 1985a].

2.3.2 Soil and Geology

The site is located in a scoria quarry, and most surfaces within the site have been excavated to access the scoria gravel. All exposed soil was composed of scoriaceous gravel and limited bedrock.

2.3.3 Surface Water

The nearest surface water bodies to the Telegraph Hill scoria pit are four small "lakes" located about 0.5 mile east and south of the site. No direct surface water runoff pathways between the site and the lakes are evident.

2.3.4 Groundwater

Groundwater beneath the Telegraph Hill site likely is present at depths close to sea level. Therefore, the depth to groundwater at the site is estimated at 46 feet bgs at the bottom of the actively quarried area and 170 feet bgs near the top of Telegraph Hill. The City of St. Paul municipal well field is located east/northeast of Telegraph Hill, within about 1/2 mile of the Telegraph Hill scoria pit (Figure 2).

2.3.5 Site Contamination

Over the years, heavy machinery and more than 4000 barrels were staged or abandoned at this site by the DOD, the Bureau of Commercial Fisheries (to a limited extent), a predecessor agency to the NOAA's National Marine Fisheries Service, and unidentified entities. An unknown number of barrels contained fuels and used oil, and leaks were reported. When the TPA was established in 1996, approximately 200 drums remained at Telegraph Hill (NOAA 1996).

2.4 CONCEPTUAL SITE MODEL

Conceptual site models are used to identify pathways by which human and ecological receptors may be exposed to contamination. Each exposure pathway has four fundamental components: 1) a source and mechanism of chemical release, 2) an affected environmental medium and potential chemical migration process, 3) an exposure point, and 4) an exposure route by which receptors come in contact with site contaminants. If any one of these

does not exist, the potential exposure pathway is incomplete. Components of exposure pathways that could exist at the Telegraph Hill scoria pit site and potential receptors are described in the following sections and summarized in Table 1.

2.4.1 Source and Mechanism of Chemical Release

Potential sources of contamination at the site include petroleum constituents in surface and subsurface soils. Drums containing fuels and used oil were previously staged or abandoned at this site, and associated leaks were reported.

2.4.2 Affected Environmental Medium and Potential Chemical Migration Process

Sources of contamination were likely originally located at the ground surface. The ground surface is scoriaceous gravel with minimal vegetation consisting of short grasses and flowering plants. Overland transport of contamination is not considered an active mechanism because surface soil contamination does not appear to be extensive and the precipitation rate and the soil permeability are conducive to driving the contamination downward rather than laterally.

Subsurface transport pathways include vertical migration through the vadose zone and migration into groundwater. The combination of moderate rainfall, precipitation to infiltration ratio, and permeable shallow soil promote vertical migration of contaminants through the vadose zone. Groundwater is estimated to be 46 feet bgs (close to sea level) at the bottom of the currently quarried area. Tidal influence on site groundwater and the net water balance could cause lateral migration of contaminants in groundwater. The City of St. Paul municipal well field is located within 1/2 mile east/northeast of the site.

Surface water and air are not considered affected environmental media or transport pathways. The nearest surface water bodies to the Telegraph Hill scoria pit site are four small lakes located about 0.5 mile east and south of the site. No direct surface water runoff pathways between the site and the lakes are evident. Air is not considered an effected medium at present because the suspected contaminants of concern (COC) and contaminants of potential concern (COPC) have low vapor pressures.

2.4.3 Exposure Points

Potential exposure points are the Telegraph Hill scoria pit site and residential tap water.

2.4.4 Receptors and Exposure Routes

The current and anticipated future use of Telegraph Hill is occasional quarrying for scoria. Based on site use, temporary workers are considered the primary potential human receptor. Island residents are another potential human receptor. Potential exposure routes for humans include dermal contact, incidental ingestion of soil, inhalation of particulates, and ingestion of tap water (should there be a hydrologic connection to St. Paul drinking water wells now or in the future).

Fox, shrews, passerine birds, and reindeer are potential ecological receptors. Potential exposure routes for these animals include dermal contact, inadvertent ingestion of soil, and inhalation of particulates. Given the lack of surface water and scarcity of vegetation at the site and the site's industrial nature, it is not expected that animals would prefer this site for habitat or foraging/grazing land. Thus, animals would likely be visitors to the site rather than residents.

Table 1. Conceptual Site Model for Telegraph Hill Scoria Pit Site

Source/mechanism of release	Environmental Exposure Medium	Exposure Point	Exposure Route	Receptors
Petroleum constituents from leaking oil drums	Soil	Telegraph Hill scoria pit site	Dermal contact, incidental ingestion of soil, inhalation of particulates	Temporary workers, fox, shrews, passerine birds, reindeer
Petroleum constituents from leaking oil drums	Groundwater	Tap water	Ingestion	Island residents

3.0 PREVIOUS INVESTIGATIONS AND OTHER ACTIVITIES

Previous investigation and activities conducted at and adjacent to the Telegraph Hill scoria pit site include the 1986 debris removal by Chase Construction, Inc. (Chase); 1992 preliminary assessment by Ecology and Environment, Inc. (E&E); 1997 debris removal by Aleutian Enterprises; 1999 closure confirmation by Tetra Tech; and 2000 debris removal and soil and groundwater sampling (site closure) by Nortech. These investigations and activities are summarized in the following sections.

3.1 DEBRIS REMOVAL (1986)

In 1986, Chase conducted debris removal activities at St. Paul Island under contract to the U.S. Army Corps of Engineers. As part of the debris removal project, Chase reportedly removed an estimated 4,000 drums from DOD FUDS C (also known as the Telegraph Hill Barrel Dump). FUDS C reportedly surrounded the scoria pit at Telegraph Hill (Figure 2) and measured about 2 acres [DOD 1985a].

After debris was removed, Chase reportedly placed it in a burial pit north of Polovina Hill, near the Vehicle Boneyard (TPA Site No. 2) and about 12 miles north of the City of St. Paul. Available information does not indicate whether soil samples were collected during the debris removal (U.S. Army 1991).

3.2 PRELIMINARY ASSESSMENT (1992)

During a 1992 preliminary assessment, E&E inspected the Telegraph Hill scoria pit site and observed two power shovels on the north side of the hill. About 125 rusted drums and drum remnants were located uphill of the power shovels. Most of the drums were labeled as containing aviation fuel or hydraulic oil, and most were empty. During the assessment, stained soil was not observed (E&E 1993).

3.3 DEBRIS REMOVAL (1997)

In 1997, Aleutian Enterprises conducted debris removal activities at the Telegraph Hill scoria pit site. Two power shovels and an unspecified amount of metal debris were removed (Aleutian Enterprises 1997).

3.4 CLOSURE CONFIRMATION (1999)

Tetra Tech (2000) undertook closure confirmation activities at the Telegraph Hill scoria pit site in September 1999. The overall objective for the closure confirmation was to develop and implement a plan of action resulting in the collection of sufficient data to 1) justify a NFA request, or 2) determine if additional site characterization data was warranted, or 3) prepare corrective action specifications that would eventually lead to proper site closure. The strategy for closure confirmation included site reconnaissance and sample collection.

3.4.1 Debris Survey

Tetra Tech conducted a visual inspection of the Telegraph Hill scoria pit and attempted to conduct a geophysical survey to locate buried metallic debris. The geophysical survey could not be successfully completed due to significant magnetic interference from the natural geological features such as basalt boulders. Through the visual

inspection, Tetra Tech observed a number of drums that apparently had been excavated from the Telegraph Hill scoria pit. These drums purportedly were placed at the site in the 1940s or 1950s and were relics of the World War II era. Most of the excavated drums were crushed and dilapidated and had been moved from their burial locations as a result of quarry operations. These drums were scattered about the active quarry area. Based on the presence of these drums, additional buried drums were suspected at the site.

Tetra Tech observed possibly 100 additional drums stockpiled near the southern boundary of the active quarry pit. Though nearly intact, the drums all exhibited some corrosion. All of the accessible drums were inspected and appeared to be empty. Several of these drums were labeled, indicating that they once stored petroleum products.

The stockpiled drums appeared to be significantly newer than and did not exhibit nearly the degree of corrosion as the excavated drums, suggesting that they were relatively recently placed at the site. However, Tetra Tech was unable to identify an approximate date on which the drums came to be located at the site.

Based on data gathered during the field effort, Tetra Tech was not able to confirm that NOAA is responsible for any of the drums or other debris present at the Telegraph Hill scoria pit. DOD purportedly brought the drums to St. Paul Island during the World War II era and buried and/or staged them at Telegraph Hill (DOD 1985a). DOD removed about 4,000 of these drums from the site in 1986 (U.S. Army 1991). However, subsequent quarrying operations apparently uncovered more drums, which were scattered about the quarry area.

3.4.2 Soil Characterization

Tetra Tech identified a “relatively small area exhibiting significant soil staining” near the top of the active quarry, along the site’s southern property line. One soil sample was collected from the surface of this area, sampling location 15SS01 (Figure 3). The sample was analyzed for gasoline-range organics (GRO); diesel-range organics (DRO); residual-range organics (RRO); benzene, toluene, ethylbenzene, and total xylenes (BTEX); polynuclear aromatic hydrocarbons (PAH); chlorinated solvents; and metals, including arsenic, cadmium, chromium, and lead.

The only fuel parameter detected was DRO, which was detected at 410 mg/kg (Table 2). This is above the ADEC Method Two cleanup level (regulatory limit) of 250 mg/kg DRO. Arsenic and Cr were detected above their Method Two regulatory limits of 2 mg/kg and 26 mg/kg, respectively (Table 2). Arsenic was detected at 3.18 mg/kg, and Cr was detected at 49.7 mg/kg. [Note: these concentrations are discussed relative to soil background concentrations in Section 6.3.]

GRO, RRO, VOCs, and BTEX were not detected in the sample. Several PAHs, including benzo(a)anthracene, chrysene, phenanthrene, and pyrene, were detected below their Method Two regulatory limits.

Table 2. Soil Analytical Lab Results Above ADEC Method Two Regulatory Limits, Telegraph Hill, St. Paul, Alaska

Source	Sample	Date	Start Depth (feet below surface)	End Depth (feet below surface)	Petroleum Hydrocarbons	Metals		Detection Flag*
					mg/kg (PPM)			
					DRO	Arsenic	Chromium (Total)	
		Method Two			**250**	**2**	**26**	
		Mean Concentration				**2.7**	**33.4**	
		Background Conc.				**3.7**	**44**	
Tetra Tech	15SS01		1	1		**3.18**		D
Tetra Tech	15SS01		1	1			**49.7**	D
Tetra Tech	15SS01		1	1	**410**			D
CESI	MWTH - 1	6/5/2000	24	26			**30.9**	D
CESI	MWTH - 1	6/5/2000	54	56			**26.8**	D
CESI	MWTH - 2	6/26/2000	9	11			**26.5**	D
CESI	MWTH - 4	11/4/2000	10	11			**83.9**	D
CESI	MWTH - 5	10/2/2000	21	22		**4.5**		D
CESI	MWTH - 5	10/2/2000	21	22			**28.6**	D
CESI	MWTH - 5	10/5/2000	76	77		**2.8**		D
CESI	MWTH - 5	10/5/2000	76	77			**45**	D
CESI	MWTH - 5	10/6/2000	103	104		**6.3**		D
CESI	MWTH - 5	10/6/2000	103	104			**29.1**	D
CESI	MWTH - 5	10/9/2000	140	141		**6.5**		D
CESI	MWTH - 5	10/9/2000	140	141			**26.5**	D
CESI	SBTH-6	8/12/2000	29	31			**27**	D

*Detection Flags
D = The analyte was detected above the Practical Quantitation Limit (PQL).

3.5 SITE CLOSURE (2000)

Nortech and Bering Sea Eccotech mobilized personnel and equipment to Telegraph Hill scoria pit debris site to conduct site closure activities (Nortech 2001). The objective of these activities was to accomplish acts necessary to gain a NFA designation from ADEC, or else gain an understanding of the corrective action efforts that could eventually lead to proper site closure.

3.5.1 Debris Removal

Nortech administered a brief and intensive program of drum and miscellaneous debris removal on June 13-14, 2000 and again from July 24-27, 2000. More than 250 crushed drums, cable, and other metallic debris were extracted from the site (Figure 2). The majority of drums removed from Telegraph Hill during this effort had no fluid contents when found and removed. The few drums found with liquid contents had their contents pumped off into new, consolidation drums for bulking and subsequent disposal of the watery, rusty fluids at the Blubber Dump. When Nortech demobilized on July 27, 2000, only one remaining on-site drum was known. This drum, crushed and buried beneath massive boulders, was reported to be empty. The metallic debris removed from this site were transported as part of a barge load of metal and rubber debris to Seattle, Washington in September 2000 for recycling.

3.5.2 Soil Characterization

No soil staining, stressed vegetation, hydrocarbon odors, or other indication of contamination was observed in the various drum/debris removal areas at Telegraph Hill. The only soils that could be considered stained were confined to the areas selected for drum crushing.

Field screening was performed using a Photo Vac Micor Tip HL-2000 photo-ionization detector (PID) with a 10.6 UV lamp and calibrated to 100 ppm with isobutylene gas. Field screening concentrated on areas of extracted drum deposits and locations where drum crushing and temporary storage occurred. Background soil (i.e., soils known to not have been in the vicinity of drums or debris removal disturbance) yielded PID results between 0.2 and 1.7 ppm under wet conditions. PID results from areas of known drum deposits or drum crushing activity ranged from the background levels to 8.7 ppm, detected in the drum crushing area in the southwest scoria pit cell. A single soil sample (SPN20616-001-S) for laboratory analysis was obtained from the soil yielding the highest observed PID result and analyzed for RRO, DRO, GRO, BTEX, PAHs, and metals (Figure 3). Analytical results for the soil sample were all below Method Two regulatory levels.

3.5.3 Groundwater Characterization

No water was exposed or seen near the work area during this debris site cleanup; thus, no water samples were collected or analyzed. Nortech considered groundwater contamination unlikely given the lack of any evidence of any significant spill, leaks, or other petroleum hydrocarbon release at this site.

3.6 GROUNDWATER MONITORING (2001)

IT Alaska, Inc. (IT) conducted three quarterly sampling events on St. Paul Island during 2001, including sampling of MWTH-1 through MWTH-5. Samples were analyzed for petroleum hydrocarbons, metals, VOCs, SVOCs, polychlorinated biphenyls, and pesticides. IT included its data in an annual groundwater report (IT 2002), which also included data from groundwater sampling conducted by CESI 2000. Likewise, CESI included some of IT's data in its 2002 site reconnaissance report (CESI 2002). For simplicity, IT's data is presented in Section 5.4.1 along with CESI's groundwater data.

4.0 FIELD METHODOLOGIES FOR SITE CHARACTERIZATION

Several methods were used to during the 2000 site characterization conducted by CESI. These are summarized in the following sections. Methods for soil, groundwater, and geohydrologic characterization were taken from industry standard operating procedures (Butler 1998, Fetter 1988, Keith 1988, and Kresic 1997) and ADEC guidance (ADEC 1999a). The remote location of St. Paul Island and limited facilities required some modifications to procedures for utility location, handling of investigation-derived waste (IDW), and sample packaging and shipping.

4.1 GEOPHYSICAL METHODS

CESI (2002) used a Fisher TW-6 inductive locator to conduct a potential source survey of the Central Pad at Telegraph Hill, a known drum disposal area (Figure 4). The instrument's transmitter induces an electromagnetic field around buried metallic objects and the resulting signal is transmitted to the receiver. The presence or absence of metallic objects is determined but not the depth. The inductive locator was tuned and tested to ensure that it was not responding to metallic surface debris. No vehicles or surficial metallic objects were in the vicinity, during the time of the inductor survey. An intersecting transect pattern was used to survey the site.

4.2 SOIL SAMPLING METHODS

CESI collected 15 soil samples from borings using two methods, mobile hollow stem auger and air rotary borings. The following sections discuss these methods in detail.

4.2.1 Mobile Hollow Stem Auger Borings

Shallow soils were sampled by mobile hollow stem auger at the Upper Pad and the Upper-Upper Pad (Figure 4), areas from which drum fragments had been removed (Appendix A, A5-A7). The collection of these soil samples was used to determine the presence or absence of soil contamination associated with known drum disposal areas.

A 4-in. solid-stem auger string was used when sampling soils with the mobile hollow-stem auger, while 8¬ in. augers were used with the hollow-stem auger. Soil samples were collected by removing the drill string (solid-stem auger) or by removing the plug and center rod assembly (hollow-stem auger). All soil samples were collected using the direct-push Geoprobe® sampler. The Geoprobe sampler consists of a stainless steel drive shoe and an acetate liner that screws into a 2-ft stainless steel core barrel with a nominal 2-in. inside diameter. The sampler was driven into the ground, and samples were collected continuously in 2-ft intervals from the ground surface to the bottom of the boring.

The soil samples were taken directly from the acetate liner, photo-documented with an Olympus 2500L digital camera, and placed into 4-oz soil sampling jars. The jars were then labeled. The samples needed for volatile organic compound (VOC) and GRO analysis were placed into tared jars with Teflon septa lids and field preserved with 25 mL of surrogate methanol according to the sampling procedures in ADEC (1999). The aliquot of surrogate methanol was carefully added to the soil in the jar using a Brinkman repipet set to deliver 25 mL. All soil jars were then placed into a cooler where they were kept at a temperature of 4 ±2˚C. The acetate liner was discarded, and the stainless sampler tube and drive shoe were decontaminated before collecting the next sample.

4.2.2 Air Rotary Borings

A Foremost Mobile B-61 air rotary drill rig was used to install deep soil borings. Air rotary borings were advanced to at least 7 ft below the groundwater table and were completed as monitoring wells.

The borings were drilled using the TUBEXTM method. In this method, a carbon steel casing was advanced into the boring behind a concentric over-reaming bit. The rotary borings were nominally 4-in. in diameter. The carbon steel casing was removed from the boring during well completion. The project geologist documented drilling and well completion information in field notebooks and boring logs.

The air rotary sampling method used a 2.5-in.-diameter split-spoon sampler consisting of a 24-in.-long carbon steel tubular section split longitudinally into two equal semicylindrical halves. The split-spoon sampler screwed onto a connector head, which was attached to the drive rod. A drive shoe was screwed onto the other end of the split-spoon sampler. The split-spoon sampler was driven into the ground using a 140-lb hammer dropped from a height of 30 in. Split-spoon samples were always collected ahead of the drill string.

The carbon steel split-spoon sampler was used to collect soil samples in unconsolidated materials; 2-ft-long soil samples were collected every 5 to 10 ft in deep soil borings. The split-spoon was opened and photodocumented with an Olympus 2500L digital camera, and the soil was immediately put into labeled soil sampling jars with a stainless steel trowel or disposable spatula. The samples needed for VOC and GRO analysis were placed into tared jars with Teflon septa lids and field preserved with 25 mL of surrogate methanol according to the sampling procedures in ADEC (1999). The aliquot of surrogate methanol was carefully added to the soil in the jar using a Brinkman repipet set to deliver 25 mL. All soil jars were then placed into a cooler where they were kept at a temperature of 4 ±2˚C. The project geologist then logged each sample into a field notebook or logbook. The split-spoon and stainless steel trowel were decontaminated between each sample.

4.2.3 Soil Decontamination Procedures

All sampling equipment (Geoprobe sampler, split-spoon sampler, disposable spatulas, and stainless spoons) was either decontaminated or disposed of after taking each sample. To decontaminant sampling equipment, it was scrubbed with a nylon or stainless brush in a solution of Alconox followed by two tap water rinses between samples (distilled or deionized water was not available in sufficient quantity on the island for equipment rinses). The acetate sample collection sleeve for the Geoprobe sampler was discarded and replaced with a new one for each sample.

The mobile hollow stem augers and tooling, drill rig, and drill rig casing and tooling were driven to the decontamination pad west of the Decommissioned Power Plant (DPP) and cleaned after each soil boring and/or well

installation. High-pressure hot water (200˚F) was used to clean the drilling rig, augers, and associated drilling equipment. All soil and water from the decontamination pad were collected and placed into drums.

4.2.4 Soil Investigation-Derived Waste

Four types of investigation-derived waste (IDW) were created during the soils investigation: 1) soil cuttings created by the air rotary drill rig and mobile hollow stem auger, 2) soil collected by Geoprobe and split-spoon sampling, 3) used decontamination water, and 4) miscellaneous plastic waste byproducts such as the plastic sheeting associated with the decontamination pad, used acetate Geoprobe sleeves, personal protective equipment (PPE), and disposable sample scoops.

All IDW soil cuttings were placed into 55-gal drums and taken to the IDW staging area located west of the Decommissioned Power Plant (DPP). After laboratory analyses were available and the material found suitable for on-island treatment, all IDW soils were transported to the Enhanced Thermal Conduction (ETC) facility on Saint Paul Island. Once at the ETC facility, the IDW soils were placed on the stockpile of contaminated soil (also known as the Blubber Dump PCS stockpile) awaiting treatment. Samples not chosen for laboratory analysis were left in the soil sampling jars with the lids and labels intact. These soils were archived on shelves inside the DPP, which served as a field workstation, and subsequently placed on the ETC facility soil stockpile by NOAA personnel.

All decontamination water was contained in 55-gal drums. After laboratory analyses were available and the material found suitable for on-island treatment, the water was transported to the ETC facility and poured on the stockpile of contaminated soil awaiting treatment.

All waste byproducts were stored in garbage bags on the project site. At the end of the project, all trash and the pressure-washed decontamination pad were transported to the Saint Paul landfill for disposal.

4.2.5 Field Analytical Methods

Standard ADEC sampling protocol requires the use of field screening devices to assess areas of suspected or obvious contamination. The requirements (ADEC 1999) include performing surveys of potentially contaminated areas to determine the approximate locations containing contaminants (qualitative screening) and screening for semiquantitative estimates of the amount of contamination present at a specific location (semiquantitative screening).

At each boring location, soil intervals were obtained and screened using the Dexsil® Petroflag™ Hydrocarbon Analyzer field screening kit. The Petroflag is a broad-spectrum field analytical tool for petroleum hydrocarbons (U.S. Environmental Protection Agency (EPA) Method 9074). In field trials, the Petroflag method has been shown to provide results that correlate well (90% R square, no false negatives, 10% false positives, range from 10 to 1000 ppm) with laboratory results (EPA Methods 8015B, 418.1). The system uses an extractant to remove hydrocarbon from a soil sample, a developer solution that precipitates an opaque solid, and a nephelometer/computer to measure solution opacity and report the results.

CESI selected samples for laboratory confirmation analysis based on the Petroflag field screening results and the following criteria.

Elevated screening results from an entire depth interval: This criterion was met by selecting soil with the largest screening values for total petroleum hydrocarbons (TPH) measured in a borehole. Application of this criterion meets the ADEC semiquantitative field-screening requirement. Confirmation analysis using this criterion provided the quantitative measure of the actual TPH concentration in the intervals with the highest screening value.

Deepest intervals with suspected contamination based on the highest screening value: This criterion was used to confirm the location of the bottom of soil contamination in a borehole, which meets the ADEC qualitative and semiquantitative field-screening requirements.

Borehole bottoms independent of the screening value: this criterion was applied to the shallower boreholes that did not reach the water table or that met with refusal. It was used to confirm that the bottom of the borehole was/was not contaminated. The nominal depth to the bottom of soil contamination was confirmed, if the bottom of the borehole was clean. Any contaminant concentration was also confirmed at the bottom of the borehole. Application of this criterion meets the ADEC qualitative and semiquantitative field-screening requirements.

Intervals near the water table independent of the screening value: this criterion was applied to the air rotary boreholes that were completed as monitoring wells. This criterion was used to determine if soil in the capillary fringe was contaminated. If the bottom of the borehole was clean, then vertical movement of contamination to the water table most likely did not impact groundwater. If the bottom of the borehole was contaminated, the level of contamination in the capillary fringe was confirmed.

The selected samples were sent to an ADEC-approved laboratory for analysis of petroleum hydrocarbons (AK101, AK102, and AK103), metals (EPA Methods 6020/7471), VOCs (EPA Method 8260B), and semivolatile organic compounds (SVOCs) (EPA Method 8270C).

4.3 GROUNDWATER METHODS

CESI and IT collected all groundwater samples considered in this site characterization. Work was conducted under standard industry operating procedures (Fetter 1988, Keith 1988) and ADEC guidance (ADEC 1992, 1999) for groundwater well installation and monitoring.

4.3.1 Monitoring Well Construction

Groundwater monitoring wells were installed in soil borings that were drilled to a minimum of 7 ft below groundwater using the air rotary method (see Section 3.2.2). Wells were completed using 2-in.-diameter Schedule 40 polyvinyl chloride (PVC) pipe and slotted PVC screen. At least 10 ft of 10-slot PVC screen was used in each well. Colorado silica sand (8x12 mesh) was placed from the bottom of the hole to 5 ft above the top of the screen. A tremie rod was used to occasionally tamp the sand pack to prevent sand bridging in the borehole; 5 ft of bentonite chips were then placed on top of the sand pack and tamped using a tremie rod. The remainder of the annulus to ~2 ft bgs was filled with bentonite grout using a tremie tube. The bentonite chips and grout were used to plug the annulus, which prevented the infiltration of surface contaminants to the water table. The wells were completed above the ground surface (stickups) with a galvanized steel well cover cemented into place to a depth of 2 ft bgs. The steel well cover had a locking hasp that was closed over the PVC stickup. The PVC well casing was capped with a J-plug sealed cap, and the steel cover was secured with a lock.

4.3.2 Monitoring Well Development

Wells were developed using the purge and surge method (ADEC 1992). A 1-L polyethylene bailer was used to pull groundwater in and out of the sand pack throughout the water column (surge). Then water was removed from the well with the bailer (purge) and placed into a 5-gal bucket. This process was repeated until the groundwater in the well was clear, and no sediment was inside the bailer. The purge and surge method used disposable bailers that were dedicated to each well.

4.3.3 Water Level Measurements

Water level measurements were recorded from a mark on the north side of the top of each PVC well casing. The measurements were taken using a Solinst 101 water level meter, a Solinst 122 interface probe, or a Heron H.01L interface probe and recorded to the nearest 0.01 ft in a field notebook (Appendix E). All water level measurement equipment was decontaminated after each water level measurement.

4.3.4 Groundwater Sampling

Groundwater was sampled at five monitoring wells across the site using the bailer method with a 1-L polyethylene bailer. Prior to sampling the well, depth to water measurements were recorded and the total volume of the well water column was calculated. A minimum of three well volumes was removed from the well prior to collecting a groundwater sample.

Groundwater samples for GRO and VOCs were collected in 40-mL volatile organic analysis (VOA) vials pre-preserved with HCl. Metals were collected in 500-mL high-density polyethylene containers pre-preserved with HNO3. DRO and SVOCs were collected in unpreserved l-L amber glass jars. VOA vials were filled completely until an inverted meniscus formed at the top of the vial. Each VOA vial was inverted to ensure that there was no airspace in the samples. All groundwater samples were sent to an ADEC-approved laboratory for analysis of

petroleum hydrocarbons (AK101 and AK102), metals (EPA Methods 6020/7470), VOCs (EPA Method 8260B), and SVOCs (EPA Method 8270C).

4.3.5 Water Decontamination Procedures

The water level meters and water level loggers were washed in an Alconox solution and tap water rinse whenever the instruments were moved from one well to another.

4.3.6 Water Investigation-Derived Waste

Three types of IDW were produced during the groundwater investigation fieldwork: 1) purge water, 2) decontamination water, and 3) waste byproducts such as disposable bailers, rope, used PPE, and plastic sheeting associated with the decontamination pad. All IDW associated with cleaning the air rotary drill rig was contained at the decontamination pad located to the west of the DPP. Once the IDW was contained, it was pumped into a 55-gal drum and placed in the IDW staging area located to the west of the DPP. Well purge water was also contained in 55-gal drums at the IDW staging area. After laboratory analyses were available and the material found suitable for on-island treatment, all IDW was transported to the ETC facility on Saint Paul Island and poured on the stockpile of contaminated soil awaiting treatment.

All solid waste byproducts were stored in garbage bags on the project site. At the end of the project, all trash and the pressure-washed decontamination pad were transported to the Saint Paul landfill for disposal.

4.4 SURVEYING METHODS

CESI conducted surveying with GPS mapping using the Trimble XR/XRS GPS with differential correction for horizontal positioning and for wellhead elevations using a Leica total station for optical leveling.

4.4.1 GPS Mapping

GPS provided accurate (± 2 cm) soil boring and monitoring well locations. A data dictionary for St. Paul 2001 was created to identify data points and was loaded into the Trimble rover unit. Once the data points were taken and saved, the file was differentially corrected using the Pathfinder Office® software and the data from the Trimble base station. The Village Hill benchmark was used to calibrate the GPS during the field season. The resultant GPS data was used to create geographic information system (GIS) maps of soil and groundwater data. GPS data of the soil sample locations also ensured that the locations could be easily relocated if corrective actions were required at the site.

4.4.2 Optical Leveling

All well elevations were surveyed using a Leica total station with 3-arc second resolution. After setting up and leveling the instrument, one or more known reference points such as benchmarks or existing wellheads were surveyed (backsights). The backsight process established the height of the instrument on the tripod. Then new wellheads were surveyed (foresights). Finally, the survey was closed by backsighting to the original reference points. The backsights and foresights were reduced by least-squares to establish the wellhead elevations. The elevations of the wellheads were determined to within 0.01 ft (root mean-square error).

4.5 SAMPLE HANDLING, PACKAGING, AND SHIPPING

The following procedure was used to handle, package, and ship groundwater and soil samples.

1. Each sample container was labeled with a unique sample identification number, the time and date of sample collection, the analytical method, and the method of preservation. All sample containers were placed in a cooler containing gel packs to maintain the samples at 4 ±2 °C during field sampling.
2. Each sample was logged on the Chain-of-Custody form.
3. The samples were transferred to a refrigerator maintained at 4 ±2 °C at the field laboratory until they could be shipped off island.

4. Soil samples were transported to the fixed analytical laboratory in a shipping cooler packed with absorbent material and gel packs to maintain the cooler at 4 ±2 °C during shipment.
5. The signed Chain-of-Custody form was taped on the underside of the cooler lid in a sealed plastic bag.
6. The lid of the cooler was secured with strapping tape and custody seals were affixed across the lid/cooler interface. Appropriate waybills were taped to the top of the cooler.
7. The samples were transported to the Saint Paul Airport and shipped via commercial carrier to Friedman & Bruya, Inc., an ADEC-accredited laboratory in Seattle, Washington, for chemical analysis.

5.0 RESULTS OF 2000 SITE CHARACTERIZATION ACTIVITIES

The 2000 site characterization activities conducted by CESI included a potential source survey, soil sampling, and groundwater well installation and sampling (CESI 2002). The following sections discuss the results of field activities and laboratory analyses (see Appendices B through F for raw data).

5.1 DATA QUALITY

An assessment of data quality was performed by CESI in 2002. NOAA evaluated CESI's data quality assessment. NOAA's evaluation is documented in the Data Evaluation Report (Appendix G). In general, NOAA and CESI found the data adequate for project decision-making relative to determining the presence, nature, and extent of contamination at Telegraph Hill scoria pit site. Limitations on the data, in the context of usability, are discussed in Appendix G.

In its 2002 site reconnaissance report, CESI included groundwater data from two quarterly events (February and May 2001) conducted by IT. For simplicity, all three quarters of data collected by IT are presented with CESI data in Section 5.4.1. IT (2002) reported that several anomalies were noted in the analytical results from September 2001 groundwater sampling. Irregularities in some of the results included the "inadvertent" spiking of a method blank with DRO and RRO. The laboratory compared the chromatogram of the blank with that of the spiking solution to confirm the mistake. The laboratory also compared the chromatogram of the spiked blank with that of the field samples in the batch to confirm that they had not been accidentally spiked. Nonetheless, IT stated that care should be exercised in data interpretation due to the marginal laboratory performance evidenced by the data packages.

5.2 POTENTIAL SOURCE SURVEY

The potential source survey was conducted with a Fisher TW-6 inductive locator. Inductive location can be used to determine the presence of metallic objects, but not the depth. The entire Central Pad (Figure 4) was surveyed, and a strong response was obtained over most of the survey area. Later, during the 2001 field season, it was observed that some excavation in the Central Pad, likely associated with scoria mining, had taken place since the 2000 field season. Rusted drums and drum fragments were protruding from the ground throughout the excavation area, confirming the results of the inductive locator survey (Appendix A, A-8).

5.3 SOIL CHARACTERIZATION

Fifteen soil samples were collected by CESI at the Telegraph Hill scoria pit site. Samples were collected from nine locations with collections from more than one depth at some locations (Figure 3). For petroleum hydrocarbons, DRO and RRO were detected but not above their Method Two regulatory levels of 250 mg/kg and 10,000 mg/kg, respectively. Thirty-three percent (33%) of samples contained DRO above the laboratory-reported practical quantitation limit (PQL) of 10 mg/kg with concentrations ranging from 43 to 250 mg/kg. RRO was detected above the laboratory-reported PQL of 50 mg/kg 33% of the time with concentrations ranging from 65 to 260 mg/kg.

DRO and RRO concentrations varied in vertical extent. CESI collected soil samples down to the water table where wells were installed. Beneath the known drum disposal areas at Telegraph Hill, DRO and RRO extended to groundwater at monitoring well-Telegraph Hill (MWTH) -1. Field screening results at MWTH-2 and soil boring-Telegraph Hill (SBTH) –3 indicated that, in soils beneath the Central Pad (Figure 4), low concentrations of petroleum products extended to approximately 70 ft bgs. Soils beneath the Upper Pad (SBTH-4, -5, -6; Figures 3 and 4) had detectable concentrations of DRO and RRO in the upper 5 ft bgs. Soils beneath the eastern (MWTH-4) and southern (MWTH-5) peripheries of the site did not contain any petroleum-related analytes, nor did soils beneath the Upper-Upper Pad (SBTH-1 and -2; Figures 3 and 4) above the refusal point of 5 to 7 ft bgs.

Of the Resource Conservation and Recovery Act (RCRA) metal constituents (Ag, As, Ba, Cd, Cr, Hg, Pb, and Se), As, Ba, and Cr were detected 100% of the time. Cd, Pb, and Se were detected at varying frequencies. Arsenic and Cr were detected above their Method Two regulatory limits of 2 mg/kg and 26 mg/kg, respectively (Table 2). Arsenic concentrations varied from 0.2 to 6.5 mg/kg, with concentrations above Method Two regulatory limits detected at MWTH-5. Cr concentrations varied from 14 to 83.9 mg/kg, with concentrations above Method Two regulatory limits detected at five of the nine sampling locations (MWTH-1, -2, -4, -5, and SBTH-6). Sample concentrations for both metals, however, were within background levels for St. Paul Island soils as discussed in Section 6.3 (Hart Crowser 1997 and Tetra Tech 2000).

Of the 61 VOCs that are target analytes listed in EPA Method 8260, none were detected above their respective PQLs in soil. Two of the 66 SVOCs, bis(2-ethylhexyl)phthalate and dimethylphthalate, listed as target analytes in EPA Method 8270 were detected above their respective PQLs in soil, but below Method Two regulatory limits.

5.4 GROUNDWATER CHARACTERIZATION

In its 2002 site reconnaissance report, CESI included groundwater data from two quarterly events conducted by IT (February and May 2001). For simplicity, all three quarters of data collected by IT (see Section 3.6) are presented with CESI data below.

5.4.1 Groundwater Contamination

CESI and IT collected a total of 27 groundwater samples, including two duplicates, from five monitoring wells (MWTH-1 through MWTH-5) during approximately quarterly sampling conducted November 2000 and through September 2001. Monitoring well locations are depicted in Figure 5.

DRO and RRO were the only petroleum analytes detected above the laboratory PQLs. DRO detections, varying from 0.06 to 0.28 mg/L in four of the five wells, did not exceed the Table C regulatory limit of 1.5 mg/L. During the final quarter of sampling only (September 2001), RRO was detected above the Table C regulatory limit of 1.1 mg/L in samples collected from MWTH-2 and MWTH-3 (Table 3). The RRO concentration in both wells was 1.5 mg/L. These results, however, are suspect because RRO was reported in the associated method blank, and the RRO results of a field duplicate sample from MWTH-3 were significantly lower and below the Table C regulatory limit (see Section 5.1). Furthermore, ADEC has not approved a method for the analysis of RRO in groundwater.

Of the 61 VOC target analytes listed in EPA Method 8260, acetone and methylene chloride were detected. Acetone was detected in a single sample from MWTH-2 at a concentration of 24 µg/L, which is below its Table C regulatory limit of 3.65 mg/L. Methylene chloride was detected above Table C regulatory limits in MWTH-5 during the September 2001 sampling event (Table 3). It was detected at 5.9 µg/L, just above the regulatory limit of 5 µg/L. However, methylene chloride was also detected in the method blank and is believed to be a laboratory contaminant.

Chromium was detected in three samples from two locations above its Table C regulatory limit of 100 µg/L (Table 3). However, when Cr was analyzed for using a method with lower limits of detection (i.e., using inductively coupled plasma (ICP)-mass spectroscopy rather than ICP), concentrations of Cr were dramatically lower. Using the ICP-mass spectroscopy method, only one sample was found to exceed the Table C regulatory limit for Cr. This sample was taken from MWTH-2 in May 2001 and contained 110 µg/L Cr. (Note: another sample taken from this location in July 2000 only contained 4.1 µg/L Cr.)

Table 3. Groundwater Analytical Lab Results Above ADEC Table C Regulatory Limits, Telegraph Hill, St. Paul, Alaska

Source	Sample	Date	*Petroleum Hydrocarbons*	*Organics*			*Metals*	Detection Qualifier*	Detection Flag**
			mg/L (PPM)						
			RRO+	Bis (2-ethylhexyl) phthalate	n-Nitrosodi-n-propylamine	Methylene chloride	Chromium (Total)		
		Method C	**1.1**	**0.006**	**0.0001**	**0.005**	**0.1**		
CESI	MWTH - 2	7/12/2000		**0.024**					D
IT	MWTH - 2	2/9/2001					**0.2**		D
IT (2002)	MWTH - 2	5/16/2001					**0.11**	A	D
IT	MWTH - 2	9/7/2001	**1.5**					B	D
CESI	MWTH - 3	6/28/2000		**0.072**					D
CESI	MWTH - 3	7/12/2000		**0.079**					D
CESI	MWTH - 3	11/17/2000		**0.039**					D
IT	MWTH - 3	2/9/2001					**0.11**		D
IT	MWTH - 3	9/7/2001	**1.5**					B	D
CESI	MWTH - 4	11/17/2000			**0.018**				D
CESI	MWTH - 5	10/14/2000		**0.037**					D
CESI	MWTH - 5	11/17/2000		**0.01**					D
IT	MWTH - 5	9/8/2001				**0.006**		B	D

Source IT (2002) = Groundwater Monitoring Report, September 2001 Quarterly Event. Table 3, "Telegraph Hill Groundwater Analytical Results Summary Table."

*Detection Qualifier

A = These analytical lab results were not provided to NOAA in digital form but are referenced in IT (2002), September 2001 monitoring, Table 3, "Telegraph Hill Groundwater Analytical Results Summary Table."

B = Analyte was detected in the laboratory method blank. See also September 2001 monitoring, Table 3, "Telegraph Hill Groundwater Analytical Results Summary Table."

**Detection Flags

D = The analyte was detected above the Practical Quantitation Limit (PQL).

+There is no ADEC approved method for the analysis of RRO in groundwater. The results reported by IT are not considered valid.

All other RCRA metal constituents, except Hg, were detected, though at varying frequencies. For groundwater samples collected by IT during February 2001, the laboratory-reported PQLs for As, Pb, and Se were greater than the Table C regulatory limits of 50 µg/L, 15 µg/L, and 50 µg/L, respectively. As, Pb, and Se were not detected above their PQLs (<100, <50, and <100 µg/L, respectively), and thus, it is not possible to determine whether February 2001 sample concentrations for these metals exceeded regulatory limits. Nevertheless, samples collected by CESI in 2000 and by IT later in 2001, had lower PQLs and As, Pb, or Se concentrations did not exceed Table C regulatory limits.

Three of the 66 SVOCs, bis(2-ethylhexyl)phthalate, dimethylphthalate, and n-nitrosodi-n-propylamine, listed as target analytes in EPA Method 8270 were detected above their laboratory-reported PQLs of 1 µg/L. The highest dimethylphthalate concentration detected was 19 µg/L, which is below its regulatory limit (EPA Region III, risk-based concentration cleanup level for tap water) of 365,000 µg/L. Bis(2-ethylhexyl)phthalate concentrations exceeded the Table C regulatory limit of 6 µg/L in six samples taken from wells MWTH-2, -3, and -5. Concentrations of bis(2-ethylhexyl)phthalate in these samples ranged from 10 to 79 µg/L (Table 3). The n-nitrosodi-n-propylamine concentrations exceeded the Table C regulatory limit of 0.1 µg/L in at least one sample. This sample

had a concentration of 18 µg/L (Table 3). Several other samples had detections of <1.0 µg/L n-nitrosodi-n-propylamine. Because the PQL for this analyte (1 µg/L) is greater than the Table C regulatory limit (0.1 µg/L), it is not possible to determine whether additional samples exceeded the regulatory level.

5.4.2 Hydrogeology

Water table elevations were measured in each of the monitoring wells during the site reconnaissance activities (Appendix E). The water table gradient was determined to be from west to east, and hence, groundwater flow direction is towards the City well field located easterly of Telegraph Hill (Figure 5). MWTH-5 showed a marked water table elevation anomaly with a water table elevation over 15 feet higher than the other four wells at the site. This inconsistency may be explained by the fact that MWTH-5 was completed in a thick clay/ash layer, and the groundwater in the vicinity of this well may be a confined or semi-confined aquifer.

6.0 SYNTHESIS AND EVALUATION OF DATA FOR SITE CHARACTERIZATION

The following sections evaluate the nature and extent of contamination in soil and groundwater at the Telegraph Hill scoria pit site. The evaluation includes data from previous analytical and geological investigations, such as those presented in Section 3, and the 2000-2001 site characterization investigations (Section 5).

NOAA compared available data with information related to fur sealing operational practices, site background concentrations for heavy metals (soils only, see Section 6.2), potential laboratory cross-contamination, data quality standards, and State of Alaska cleanup levels to determine the contaminants of concern.

GIS tools were used for data interpolation, interpretation, and visualization of the nature and extent of contamination. For purposes of the interpolation, it was assumed that the vertical extent of soil contamination does not extend deeper than 1) the deepest interval containing a contaminant of concern at a concentration greater than the Method Two cleanup level; 2) the depth of refusal as found during the investigation test pit excavation or direct-push explorations; or 3) the bottom of the vadose zone (i.e., excavation stops at the groundwater table).

6.1 REGULATORY LEVELS FOR SCREENING PURPOSES

The TPA allows NOAA to apply cleanup levels using the methods described in the 1991 non-underground storage tank regulations (ADEC 1991). However, with ADEC approval, NOAA has elected to use current regulations (ADEC 2000) to address soil cleanup. Briefly, four methods are available under the TPA to determine soil cleanup levels at petroleum-contaminated sites in accordance with the current State of Alaska Oil and Hazardous Substances Pollution Control Regulations (Title 18 of the Alaska Administration Code [AAC] 75). Method One involves the use of Table A1 of 18 AAC 75.341(a) to calculate a cleanup level and can only be applied to sites where the groundwater does not contain hazardous substances associated with the site. Method Two, discussed at 18 AAC 75.341(c), employs two separate tables including one for individual contaminants (Table B1) and one for petroleum hydrocarbon contaminants (Table B2). Method Three, discussed at 18 AAC 75.340(e), allows substitution of site-specific data for selected parameters used in the Method Two equations. Method Four, discussed at 18 AAC 75.340(f), requires the development and subsequent ADEC approval of a site specific risk assessment (ADEC 2000, 2003).

For groundwater, the current *Oil and Other Hazardous Substance Pollution Control* regulations (ADEC 2003) are the basis for establishing screening levels. The current regulations provide promulgated groundwater cleanup levels in ADEC's Table C, which are protective of drinking water sources.

For purposes of this site characterization, NOAA screened analyte concentrations against the most stringent ADEC Method Two cleanup levels for soil (18 AAC 75.341; ADEC 2000) and ADEC Table C cleanup levels for groundwater (18 AAC 75.345; ADEC 2001). Tables 4 and 5 summarize cleanup levels for select petroleum-related compounds.

Table 4. Cleanup Levels for Select Petroleum-related Compounds in Soil, ADEC (2003) Method Two Tables B1 and B2

Compound	Cleanup Level (mg/kg)
Gasoline Range Organics (GRO)	300
Diesel Range Organics (DRO)	250
Residual Range Organics (RRO)	10,000
Benzo(a)anthracene	6
Benzo(b)fluoranthene	11
Benzo(k)fluoranthene	110
Benzo(a)pyrene	1
Chrysene	620
Dibenzo(a,h)anthracene	1
Fluorene	270
Indeno(1,2,3-c,d)pyrene	11
Naphthalene	43
Benzene	0.02
Ethylbenzene	5.5
Toluene	5.4
Total Xylenes	78

Table 5. Cleanup Levels for Select Petroleum-related Compounds in Groundwater, ADEC (2003) Table C

Compound	Cleanup Level (mg/L)
Gasoline Range Organics (GRO)	1.3*
Diesel Range Organics (DRO)	1.5
Residual Range Organics (RRO)	1.1
Benzo(a)anthracene	0.001
Benzo(b)fluoranthene	0.001
Benzo(k)fluoranthene	0.01
Benzo(a)pyrene	0.0002
Chrysene	0.1
Dibenzo(a,h)anthracene	0.0001
Fluorene	1.46
Indeno(1,2,3-c,d)pyrene	0.001
Naphthalene	1.46
Benzene	0.005
Ethylbenzene	0.7
Toluene	1.0
Total Xylenes	10.0

*standards based on estimate solubility

6.2 DATA QUALITY

NOAA reviewed Tetra Tech's Data Quality Evaluation Report (Tetra Tech 2000) and Nortech's laboratory analytical reports (Nortech 2001) but did not prepare separate written evaluations. NOAA concurred with Tetra Tech's assessment that data for sample 15SS01 are acceptable and usable. Data for sample SPN 20616-001-S collect by Nortech were also determined by NOAA to be acceptable and usable. NOAA considers data from samples collected by IT in September 2001 to be suspect due to instances of blank contamination and accidental spiking with target analytes, as well as several instances of surrogates, control samples, and matrix spike/matrix spike duplicate (MS/MSD) recoveries outside of required limits. NOAA's evaluation of CESI's data quality is present in section 5.1 and in Appendix G.

6.3 BACKGROUND CONCENTRATIONS

Background concentrations of a hazardous substance can be used to distinguish site-related contamination from naturally occurring or pre-existing concentrations of a hazardous substance. According to ADEC guidance, if the statistical mean concentration is below the approved background concentration, then the applicable cleanup standard for that hazardous substance has been achieved under 18 AAC 75.340(e)(1) (ADEC 1998).

Hart Crowser (1997) and Tetra Tech (2000) established background values for metals in soil on St. Paul Island. Hart Crowser analyzed soil samples collected from depths of 0.5 ft bgs at 10 locations. Each soil sample was analyzed for As, Cd, Cr, Cu, Pb, and Hg. Tetra Tech collected 22 soil samples from 7 soil borings and analyzed them for As, Cd, Cr, and Pb. Tetra Tech collected samples from the soil borings at 0 to 2 ft bgs, 4 to 6 ft bgs, and 12 ft bgs (or refusal). In the Hart Crowser and Tetra Tech studies, the soil samples were described as being collected from either sand or scoria. For purposes of this site characterization, data from both studies have been combined to determine the approved background concentration according to ADEC guidance. The approved background concentration is the 95th upper confidence limit of the arithmetic mean from normal distributions.

Table 4 presents the mean background concentrations of metals in soil with their 95th percentile upper confidence limit. In the cases of Cd and Pb, it was not possible to calculate means or the upper confidence limits because concentrations were below their PQLs.

Table 6. Statistical Results of St. Paul Island, Alaska Soil Metal Background Concentration Studies

No. of Samples	Metal	Method Two Regulatory Limit	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Mean (mg/kg)	Std. Deviation (mg/kg)	UCL95 (mg/kg)
32	As	2	<0.58	6.2	3.1	8.6	3.7
32	Cd	5	<0.62	<7.2	--	--	--
32	Cr	26	7	84	38	101	44
32	Pb	400*	<0.44	5.7	--	--	--

*Alaska residential cleanup standard for lead (18 AAC)

6.4 NATURE AND EXTENT OF SOIL CONTAMINATION

Soil samples were collected from 11 locations at the Telegraph Hill scoria pit site for analytical chemistry analyses. At four locations, samples were collected at more than one depth, bringing the total number of samples collected to 17. All but two samples were collected by CESI during the 2000 field season. Tetra Tech and Nortech each collected one soil sample during the 1999 and 2000 field seasons, respectively. The sampling locations are depicted in Figure 3 along with the Tract 37 boundary, scoria pit perimeter (Nortech 2001), potential buried debris fields, and drum excavation areas (Nortech 2001).

DRO was found above the ADEC Method Two regulatory limit of 250 mg/kg in one sample, sample 15SS01. This sample contained 410 mg/kg DRO and was collected by Tetra Tech in 1999 from an area exhibiting significant oil staining near the top of the active quarry, along the site's southern property line. It appears that this elevated DRO concentration was an isolated incident. According to Tetra Tech (2000), the sample was collected

from the only obviously oil-stained soil, which covered a relatively small area. There is no documentation of when and if this contaminated soil was removed, but contractors were directed to remove the stained soil (pers. comm., J. Lindsay). In 2000, CESI took a sample (SBTH-1) 1.4 m northeast of the sample location 15SS01. The DRO concentration in this sample was below the laboratory-reported PQL of 10 mg/kg. Furthermore, Nortech (2001) reported that no soil staining, stressed vegetation, hydrocarbon odors, or indications of the presence of contamination was observed in the various drum/debris removal sites at Telegraph Hill during 2000 site closure activities. It is also important to note that the ADEC Method Two regulatory limit of 250 mg/kg for DRO in soil is the most stringent Method Two level and is for migration to groundwater. Groundwater concentrations of DRO were well below the ADEC Table C regulatory limit of 1500 µg/L, and therefore, it could be considered more appropriate to use soil regulatory limits for other pathways. Method Two regulatory limits for ingestion and inhalation, 10250 mg/kg and 12500 mg/kg, respectively, were not exceeded at the Telegraph Hill scoria pit site. Given these factors, NOAA does not consider DRO a contaminant of concern at this site.

No metal concentrations exceeded both background levels and regulatory limits. Arsenic and Cr were the only metals found to exceed their ADEC Method Two regulatory limits, 2 mg/kg and 26 mg/kg, respectively; however, the mean As and Cr concentrations were below their approved background concentrations. Thus, the applicable cleanup standards have been achieved under 18AAC 75.340(e)(1), and As and Cr are not considered contaminants of concern. The mean sample As concentration for this site was 2.7 mg/kg. The 95th percentile upper confidence limit of the mean As background concentration was 3.7 mg/kg (Hart Crowser 1997 and Tetra Tech 2000) (Table 4). The mean sample Cr concentration was 33.4 mg/kg. The 95th percentile upper confidence limit of the mean Cr background concentration was 44 mg/kg. Background concentrations are discussed in more detail in Section 6.3.

Detected levels of GRO, RRO, BTEX, VOCs, SVOCs, and PAHs at the Telegraph Hill scoria pit site did not exceed the ADEC Method Two regulatory limit.

6.5 NATURE AND EXTENT OF GROUNDWATER CONTAMINATION

Groundwater samples were collected for analytical chemistry analyses from five monitoring wells during multiple sampling events at the Telegraph Hill site. These samples were collected by CESI and IT during the 2000 and 2001 field seasons, respectively. Sampling locations are depicted in Figure 5 along with the Tract 37 boundary, scoria pit perimeter (Nortech 2001), potential buried debris fields, and drum excavation areas (Nortech 2001).

RRO is not easily dissolved in groundwater, and ADEC has no approved method for the analysis of RRO in groundwater. IT, however, attempted to adapt soil analytical method AK103 for this purpose. Using the adapted method, RRO was detected above the Table C regulatory limit of 1.1 mg/L in samples collected from MWTH-2 and MWTH-3 (Table 3) during September 2001. RRO was not detected above its regulatory limit during earlier groundwater sampling events at this site. Furthermore, RRO was reported in the associated method blank, and the RRO results from a field duplicate sample from MWTH-3 were significantly lower and below the Table C regulatory limit. For these reasons, RRO data for groundwater samples are not considered valid.

IT (2002) reported that several anomalies were noted in the analytical results from the September 2001 sampling event. Irregularities in some of the results included the “inadvertent” spiking of a method blank with DRO and RRO. The laboratory compared the chromatogram of the blank with that of the spiking solution indicating a lab error. However, the laboratory also compared the chromatogram of the spiked blank with that of the field samples in the batch and concluded that the samples had not been accidentally spiked. Nonetheless, IT stated that care should be exercised in data interpretation due to the marginal laboratory performance evidenced by the data packages.

Chromium was the only metal found in groundwater above its Table C regulatory limit of 100 µg/L (Table 3). It was detected in three samples from two of five wells on one or more but not all sampling dates. However, when Cr concentration was analyzed using a method with lower limits of detection (*i.e.*, using ICP-mass spectroscopy rather than ICP) concentrations of Cr were dramatically lower. Using the ICP-mass spectroscopy method, only one sample was found to exceed the Table C regulatory limit for Cr. This sample was collected from MWTH-2 in June 2001 and contained 110 µg/L Cr, just above the regulatory limit. Speciation of Cr revealed that it is predom-

inantly in the less toxic Cr^{+3} form (Miller 2002). If the ADEC Cr+3 groundwater regulatory limit (36,500 µg/L) is applied, all sample concentrations are well within the acceptable limit. Therefore, Cr is not considered a contaminant of concern in groundwater.

Methylene chloride was detected in MWTH-5 above the Table C regulatory limit of 5 µg/L (Table 3). It was also detected in the method blank and is believed to be a laboratory contaminant. Therefore, NOAA does not consider methylene chloride a contaminant of concern.

Two SVOCs, bis(2-ethylhexyl)phthalate and n-nitrosodi-n-propylamine, exceeded ADEC cleanup criteria. Nevertheless, for the purposes of this site characterization, NOAA does not consider these analytes contaminants of concern. Bis(2-ethylhexyl)phthalate is not considered a contaminant of concern because it is a common artifact of a combination of laboratory and field sampling methods, and because there is no known source for it at the Telegraph Hill scoria pit site. N-nitrosodi-n-propylamine is not considered a contaminant of concern because two additional samples taken from the same well at a later date found no contamination and because there is no known source for it at the Telegraph Hill scoria pit site.

6.6 REVISIONS TO THE CONCEPTUAL SITE MODEL

The conceptual site model (Section 2.4) was revised based on the results of this site characterization. No contaminants of concern were found for soil. Though in one case DRO was detected above the Method Two regulatory limit for migration to ground water, DRO was not detected in groundwater and its concentration was well below regulatory limits for inhalation and ingestion pathways. Furthermore, the contaminated soil is believed to have been removed (see Section 6.4). Lack of this source, or even its presence below inhalation and ingestion limits, removes potential exposure pathways for humans and ecological receptors via dermal contact, incidental ingestion, or inhalation of soil and particulates.

7.0 SITE CHARACTERIZATION SUMMARY AND CONCLUSIONS

Debris, including drums, power shovels, cable, and other metallic items, were removed from the Telegraph Hill scoria pit site during several efforts occurring between 1986 and 2000. With the exception of one drum, which was crushed and buried beneath massive boulders, all known debris was removed from the site as of July 2000. However, episodic excavation at this active quarry site continues to occasionally reveal drums and drum fragments. This visual evidence of remaining debris is consistent with results of an inductive locator survey (CESI 2002).

Soil and groundwater data were compiled in this site characterization to evaluate whether past site operations and activities have contributed to elevated concentrations of hazardous materials in soil and groundwater at the Telegraph Hill scoria pit site. Data indicate that minor, isolated contamination existed at the site. For soil, only one analyte exceeded the most stringent ADEC Method Two regulatory limit or other applicable ADEC cleanup standard (*e.g.*, approved metal background concentrations). DRO was detected at 410 mg/kg at one sampling location where a small but obvious stain existed. The most stringent ADEC Method Two regulatory limit is 250 mg/kg. No documentation was found to confirm when and if this contaminated soil was removed, but contractors were directed to remove the stained soil (pers. comm., J. Lindsay). Subsequent analysis of a sample from a location 1.4 m to the northeast did not detect DRO above the Method Two regulatory limit. Furthermore, Nortech (2001) reported that no soil staining, stressed vegetation, hydrocarbon odors, or indications of the presence of contamination was observed in the various drum/debris removal sites at Telegraph Hill during 2000 site closure activities. Given these considerations and the fact that other, less stringent but appropriate, Method Two regulatory limits were not exceeded for DRO, NOAA does not consider DRO in soil a contaminant of concern.

Without an approved method for the analysis of RRO in groundwater, it cannot be determined with certainty whether RRO is present in groundwater at levels of concern. Detections of RRO in groundwater are suspect due to the lack of approved analytical method, RRO being detected in the method blank, the nature of RRO not easily being dissolved in groundwater, and several quarters of monitoring without RRO detections. Therefore, NOAA does not consider RRO in groundwater a contaminant of concern.

8.0 DISCUSSION OF REMAINING DEBRIS AND ASSOCIATED CLEANUP RESPONSIBILITY

The fact that some of the NOAA TPA sites are contiguous with Pribilof FUDS complicates cleanup issues. Section 3(f)(2) of Public Law 104-91, as amended by Public Law 106-562, which authorizes the funding for NOAA's Pribilof Islands cleanup activities, stipulates: "None of the funds authorized by this subsection may be expended for the purpose of cleaning up or remediating any landfills, wastes, dumps, debris, storage tanks, property, hazardous or unsafe conditions, or contaminants, including petroleum products and their derivatives, left by the Department of Defense or any of its components on lands on the Pribilof Islands, Alaska." In an effort to meet its legal obligations to clean up contamination and debris at TPA Site No. 15-1, which is contiguous with FUDS C, and comply with statutory constraints, NOAA has reviewed available information on cleanup and disposal actions at Telegraph Hill to determine the extent of agency responsibility for any remaining cleanup required. The following paragraphs summarize correspondence, agreements, and activities related to the cleanup of Telegraph Hill.

NOAA and ADEC signed the TPA in 1996, establishing protocols under which NOAA would clean up 15 sites, including several subsites, on St. Paul Island. Scoria Pits-Telegraph Hill Subsite was named TPA Site No. 15-1. The TPA listed the following as remaining activities for the site: 1) remove machinery bulks/debris/empty drums and take confirmation samples; and 2) submit a letter report with sample results for the site closure approval. Under the TPA, Site No. 15-1 was listed as a remedy–specific site. ADEC agreed at the time of signature that the USACE/FUDS/DOD process was the fair and correct avenue for site remediation because of drums marked "US Army" visible at the site. Accordingly, remediation of this site was left out of the TPA, and ADEC agreed to pursue an independent course of action (Appendix H, item 39). NOAA has conducted removal and characterization activities at the site in accordance with the TPA (Aleutian Enterprises 1997, Tetra Tech 2000, Nortech 2001, CESI 2002, IT 2002), and has installed monitoring wells, going beyond the scope of the agreement.

The TPA also established the protocols for adding sites to the agreement as new information arose. In 1998, ADEC notified NOAA (Appendix H, item 42) that Telegraph Hill Barrel Dump, a FUDS, was being listed as requiring further action and that NOAA, as landowner, was being held responsible for demonstrating completion of cleanup activities.

Prior to the enactment of Public Law 106-562 in December 2002, which enacted the previously mentioned spending limitation, both NOAA and the USACE had conducted efforts related to Telegraph Hill cleanup. The FUDS C was initially described as having visible debris, entirely consisting of an estimated 4000 old, rusted 55-gallon drums randomly piled over a two-acre area (U.S. DOD 1985b). During a 1985-1986 DOD restoration action at FUDS C, most empty drums were removed and reburied at a permitted site. Drums containing petroleum, oil, and lubrication products that were not DOD were stock piled at FUDS B-1, also known as the Oil Drum Dump Site (Figure 6; Chase Construction *Daily Quality Control Inspection Report* dated May 20, 1986 [Appendix I]).

NOAA personnel conducted a site inspection in 1998 and revisited the site in 1999. Prior to NOAA removal efforts in the summer of 2000, TPA Site No. 15-1 was littered with empty drums, quarry equipment, vehicles and associated debris. NOAA contractor, Nortech, conducted removal efforts, extracting more than 250 crushed drums, cable, and other metallic debris from the site (Nortech 2002). When Nortech demobilized on July 27, 2000, it reported that only one drum was known to remain on site. This drum, described as empty, was crushed and buried beneath massive boulders.

When NOAA and its contractors returned to the site the following year, it was observed that some excavation had taken place. Rusted drums and fragments were protruding from the ground. TPA Site No. 15-1 is actively quarried for volcanic scoria by local entities. As a result, barrels of uncertain origin continue to come out of the earth.

Since 1995, ADEC has repeatedly requested that USACE complete its investigation and remediation of the Pribilof FUDS Program sites, with specific mention of the Telegraph Hill scoria pit barrel dump. USACE purportedly claims, citing language from its Defense Environmental Restoration Program guidelines, that beneficial use of the islands subsequent to the 1986 USACE action precludes USACE from further action.

The DOD document *Pribilof Islands Villages of St. George and St. Paul Site Assessments Report* (U.S. DOD 1998) stated, "The 1986 BD/DR action performed by the ACOE [USACE] successfully remediated the environmental impacts due to U.S. Army occupation of the Pribilof Islands. The DOD is reported to have no current

interests on the Pribilof Islands and no further actions are planned." This report did not present sampling data to support DOD assertions, and the company who wrote the report, Portage Environmental, had not actually been to the islands.

DOD reasserted their position in an October 23, 1998 letter to ADEC stating that "impacts to St. Paul have been mitigated to acceptable risk levels and satisfy community concern… Therefore, we will not reopen our remediation." In 1999, ADEC responded to DOD's letter, essentially reiterating its concerns that a number of sites on St. Paul had not been satisfactorily closed (Appendix H, item 182).

In response to correspondence from the office of Congressman Young (Appendix H, item 33), the USACE in January 1999 (Appendix H, item 26) said, "…the Corps has evaluated all known areas of former DOD usage within the Pribilofs, and concluded there is no further DOD responsibility." The response goes on to say, "In 1986 the Corps successfully removed all DOD contamination from Telegraph Hill…to the satisfaction of the community (tribal government and native villages). Any pollution remaining was non-DOD."

While NOAA is committed to aggressively cleaning up environmental contamination on the Pribilof Islands under the TPA, it cannot accept responsibility for the activities of the USACE. Given that NOAA has conducted removal and characterization activities at Telegraph Hill in accordance with the TPA and statutory language prohibits NOAA from cleaning up contaminants left by the DOD, NOAA is precluded from taking further action at this site.

9.0 FINDINGS AND RECOMMENDATIONS

Based on the data and other information presented in this site characterization, soil and groundwater remediation are not necessary at the Telegraph Hill scoria pit site. However, should information become available indicating that contamination posing an unacceptable risk to human health or the environment is present, no further remedial action should be required of NOAA due to statutory restraints on NOAA expending appropriated funds to clean up contamination, including petroleum products, left by the DOD on lands on the Pribilof Islands.

10.0 REFERENCES

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels*. Contaminated Sites Program. July 17, 1991.

ADEC. 1992. Recommended Practices for Monitoring Well Design, Installation, and Decommissioning. State of Alaska.

ADEC. 1998. Technical Guidance Document on Determination of Background Concentrations. September 17, 1998.

ADEC. 1999. Underground Storage Tank Procedures Manual, Guidance for Treatment of Petroleum-Contaminated Soil and Groundwater and Standard Sampling Procedures. State of Alaska.

ADEC. 2000. 18 AAC 75, Articles 3 and 9. *Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. Amended through October 28, 2000.

ADEC. 2001. Calculated Cleanup Levels for Compounds without Tabular Values in Site Cleanup Rules. Technical Memorandum-01-007. State of Alaska.

ADEC. 2003. 18 AAC 78. *Underground Storage Tanks*. State of Alaska. Amended through January 30.

Aleutian Enterprises. 1997. NOAA Debris Cleanup, St. Paul Island, Alaska, Project Closeout Report.

Barth, T.F.W. 1956. *Geology and Petrology of the Pribilof Islands, Alaska*. U.S. Geological Survey Bulletin 1028 F.

Bouwer, H. and R.C. Rice. 1976. A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells. *Water Resources Research*, 12: 423-428.

Central Bering Sea Fisherman's Association (CBSFA). Undated. *St. Paul Harbor, Alaska's Sustainable Opportunity*.

CBSFA. 1998. Annual Report.

Columbia Environmental Sciences, Inc. (CESI). 2002. Site Reconnaissance Report, Telegraph Hill Scoria Pit (TPA Site 15-1), Saint Paul Island, Alaska. February.

Dames and Moore. 1999. Hydrologic Monitoring Investigation, Fourth Quarterly Sampling Event, September 1998, USCG LORAN Station, St. Paul, Alaska, Final Report. Prepared for U.S. Coast Guard, Juneau, Alaska. January.

Ecology and Environment, Inc. (E&E). 1993. Preliminary Assessment of the National Oceanic and Atmospheric Sites, Pribilof Islands, Alaska. February.

Elliott, H.W. 1976. *The Seal-Islands of Alaska*. Limestone Press, Kingston, Ontario, Canada.

Fetter, C.W. 1988. *Applied Hydrogeology*. Merrill Publishing Company. Columbus, Ohio.

Hart Crowser. 1997. *Expanded Site Inspection, St. Paul Island, Pribilof Islands, Alaska, Volume I*. Prepared by Hart Crowser for U.S. Army Corps of Engineers, Seattle District. January 1997.

IT Alaska, Inc. (IT). 2002. Draft Annual Groundwater Monitoring Report – 2001 St. Paul. March 2002.

Keith, L.H. 1988. *Principles of Environmental Sampling*. American Chemical Society, Salem, Massachusetts.

Miller, J.K. 2002. Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska. Technical Analysis and Recommendations. MTR 2002-23. Mitretek Systems.

Munter, J.A. and R.D. Allely. 1994. *Analysis of an Aquifer Test at St. Paul Island. Pribilof Islands, Alaska*. State of Alaska Division of Geological and Geophysical Surveys. Public Data File No. 94 27.

Murie, O.J. and V.B. Scheffer. 1959. *Fauna of the Aleutian Islands and Alaska Peninsula, With Notes On Invertebrates and Fishes Collected in the Aleutians, 1936-38*. U.S. Fish and Wildlife Service Publication No. 61. U.S. Government Printing Office. Washington, D.C.

National Climatic Data Center (NCDC). 2000. Internet site http://www.ncdc.noaa.gov/ol/climate/climateresources.html. January 15.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two-Party Agreement*. Attorney General's Office File No. 661-95-0126. January 26.

NOAA and U.S. Coast Guard (USCG). 1998. Plate Entitled *Pribilof Islands, Alaska, Environmentally Sensitive Areas* (Seal Islands National Historic Landmark and Part of the Alaska Maritime National Wildlife Refuge). August.

National Weather Service (NWS). 2000. Telephone Conversation between Robert Van De Graff, NWS, and Debbie Kutsal, Tetra Tech EM Inc. January 13.

Nortech. 2001. Draft Site Closure Report, Telegraph Hill Scoria Pit Debris Site (TPA Site 15). St. Paul Island, Alaska. April 23.

Tetra Tech. 2000a. Final Closure Confirmation Report, Telegraph Hill, Ridge Wall, and Lake Hill Scoria Pits, Two-Party Agreement Site No. 15, Pribilof Islands Site Restoration, St. Paul Island, Alaska. December 18.

Tetra Tech. 2000b. Soil Background Study, Pribilof Islands Site Restoration, St. Paul Island, Alaska. December 29.

Torrey, B.B. 1978. *Slaves of the Harvest*. Tanadgusix Corporation. St. Paul Island, AK.

URS Corporation. 1987. City of St. Paul Water Supply Analyses Study – Final Report.

U.S. Army. 1991. Letter Regarding Debris Cleanup and Site Restoration, St. Paul and St. George Islands. From George J. Zeiler, U.S. Army Engineer District, Alaska. To Richard Satterfield, U.S. Department of Commerce. June 28.

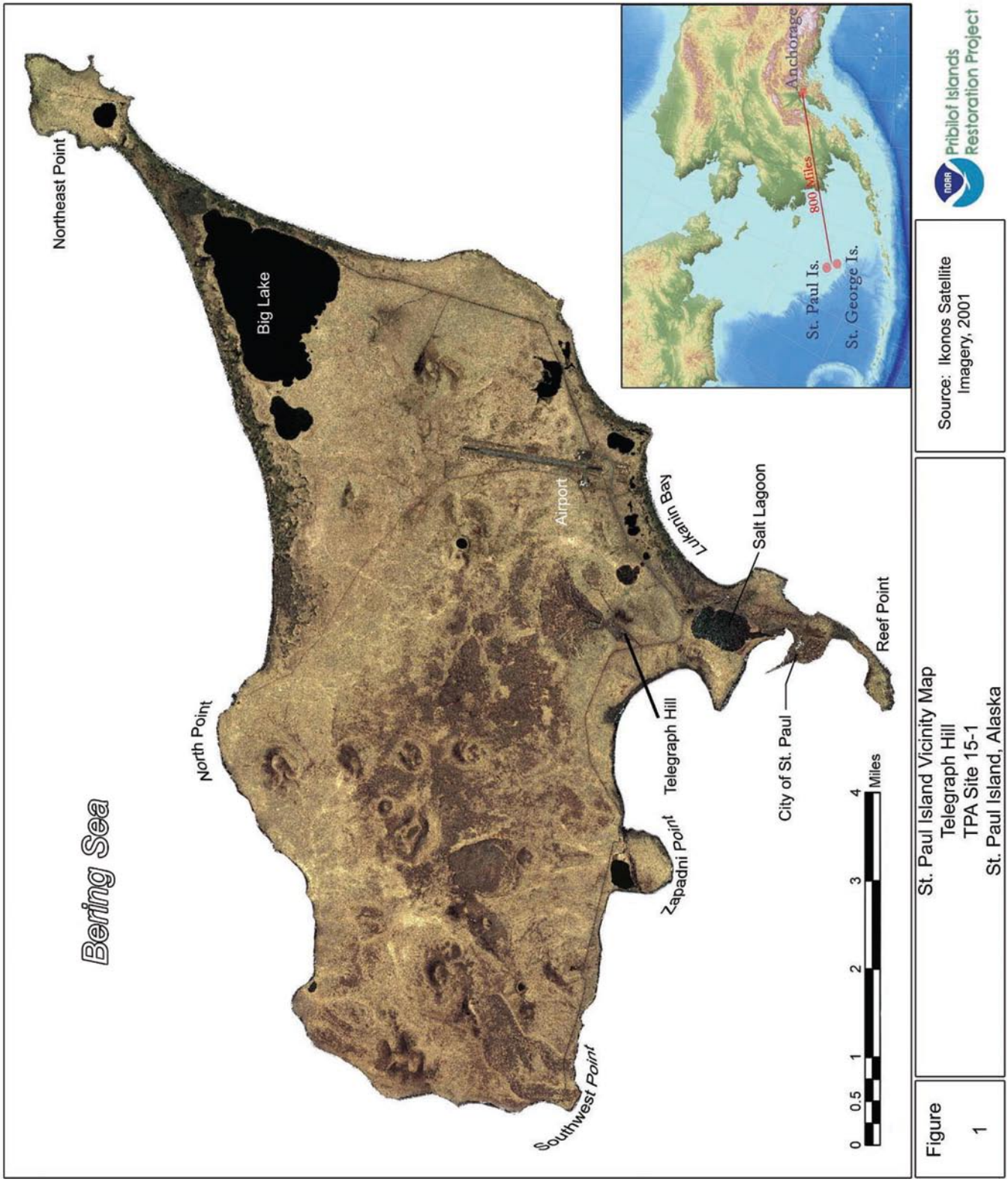
U.S. Department of Agriculture (USDA). 1972. *Alaska Trees and Shrubs*. Agriculture Handbook No. 410.

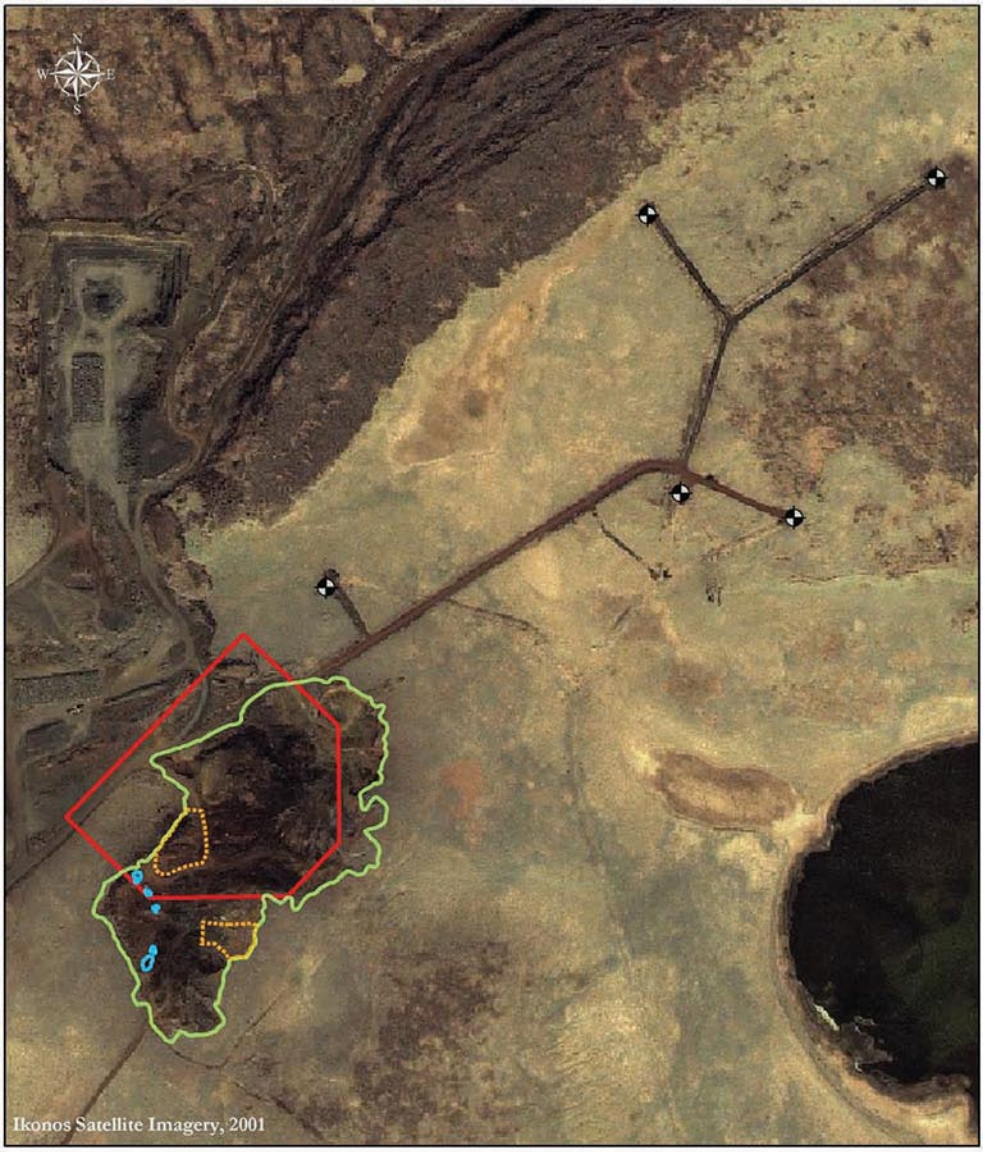
U.S. Department of Defense (DOD). 1985a. St. Paul and St. George Islands, Summary of Work for Corps of Engineers 1985 Cleanup Project under Defense Environmental Restoration Program for Formerly Used Defense Sites. September 13.

U.S. DOD. 1985b. Statement of Work Technical Specifications.

U.S. DOD. 1998. Draft Pribilof Islands Villages of St. George and St. Paul Site Assessment Report. March.

Woodward-Clyde Consultants, Inc. (Woodward-Clyde). 1994. *Site Inspection Report, St. Paul Island, Alaska*. Prepared for U.S. Army Corps of Engineers, Seattle, Washington. November.


Bering Sea
Northeast Point
Big Lake
North Point
Airport
Lukanin Bay
Salt Lagoon
Telegraph Hill
Reef Point
City of St. Paul
Zapadni Point
Southwest Point
0 0.5 1 2 3 4 Miles
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Source: Ikonos Satellite Imagery, 2001
Pribilof Islands Restoration Project
Figure 1
St. Paul Island Vicinity Map
Telegraph Hill
TPA Site 15-1
St. Paul Island, Alaska



0 75 150 300 Meters

Pribilof Islands Restoration Project

Figure 2. Map of the Telegraph Hill Scoria Pit Site (TPA Site No. 15-1) showing NOAA Property (Tract 37), the scoria pit perimeter, drum excavation areas, potential debris fields, and the location of the site relative to drinking water wells.

Legend

- St. Paul City Drinking Water Wells (CESI 2002)
- NOAA Tract 37 Boundary
- Potential Buried Debris Fields
- Scoria Pit Perimeter (Nortech 2001)
- Drum Excavation Areas (Nortech 2001)

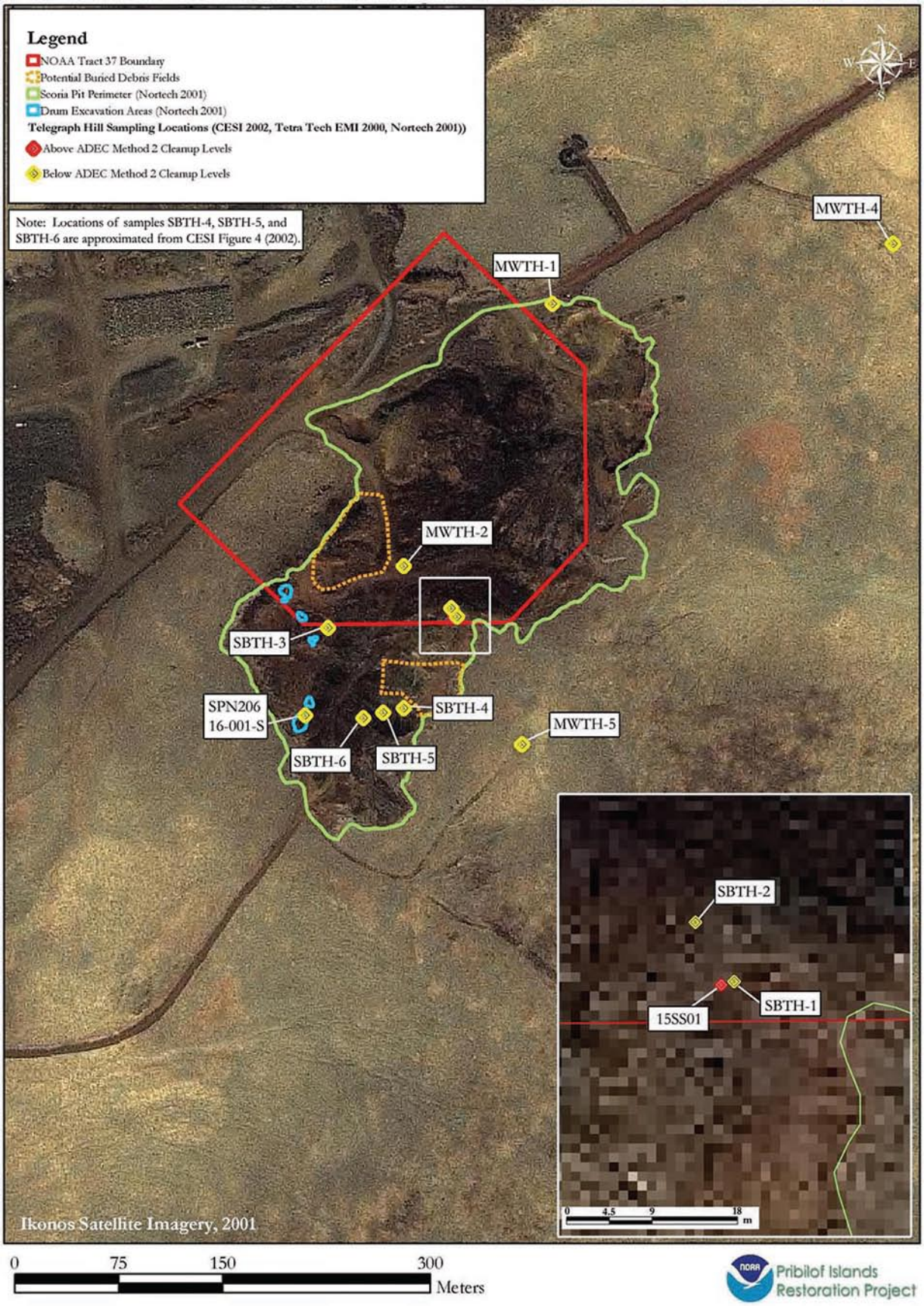


Figure 3. Soil Sampling Locations at Telegraph Hill Scoria Pit Site (TPA Site No. 15-1). Location 15SS01 indicated in red had DRO detected above Method 2 regulatory limit in 1999.

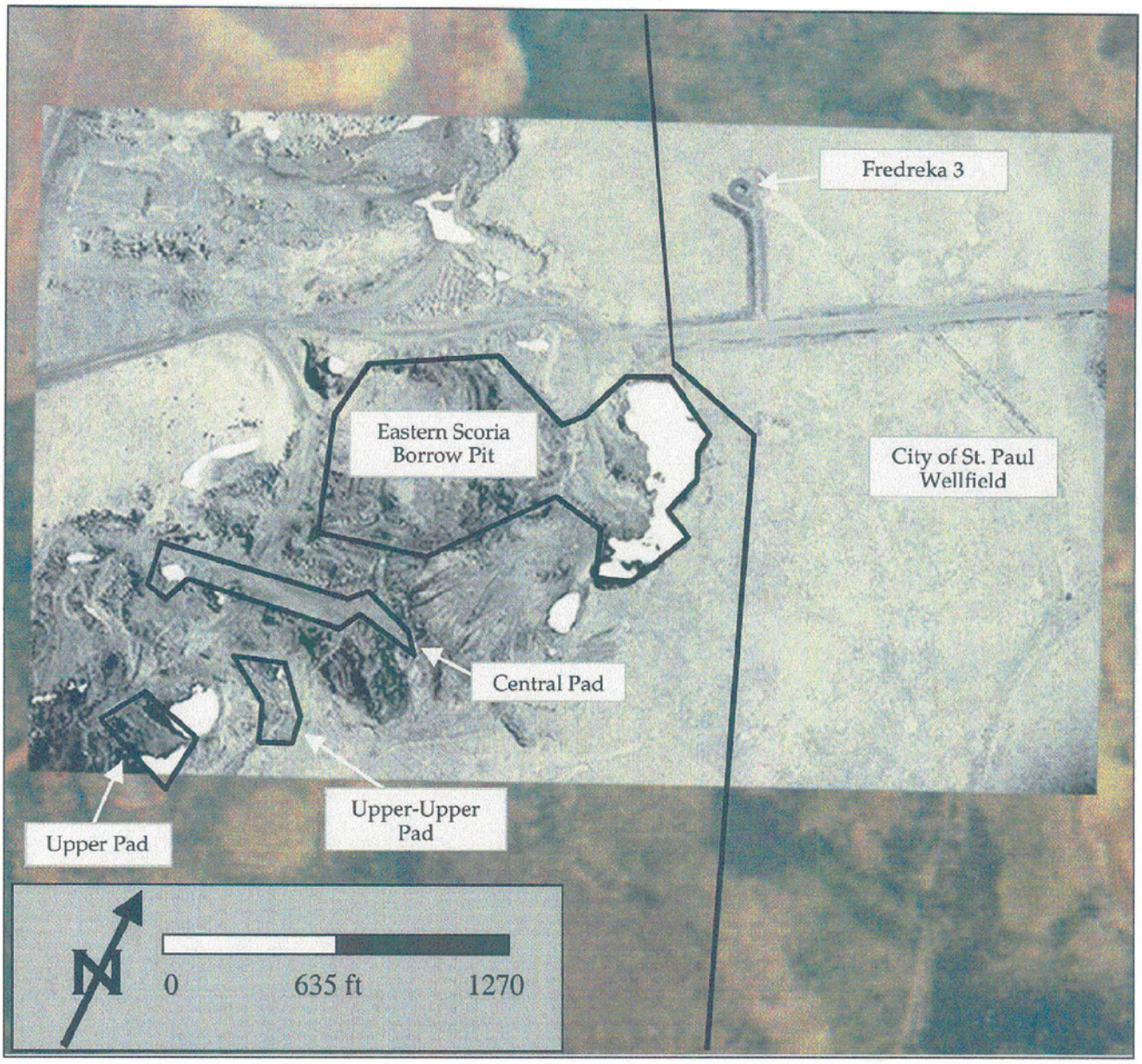
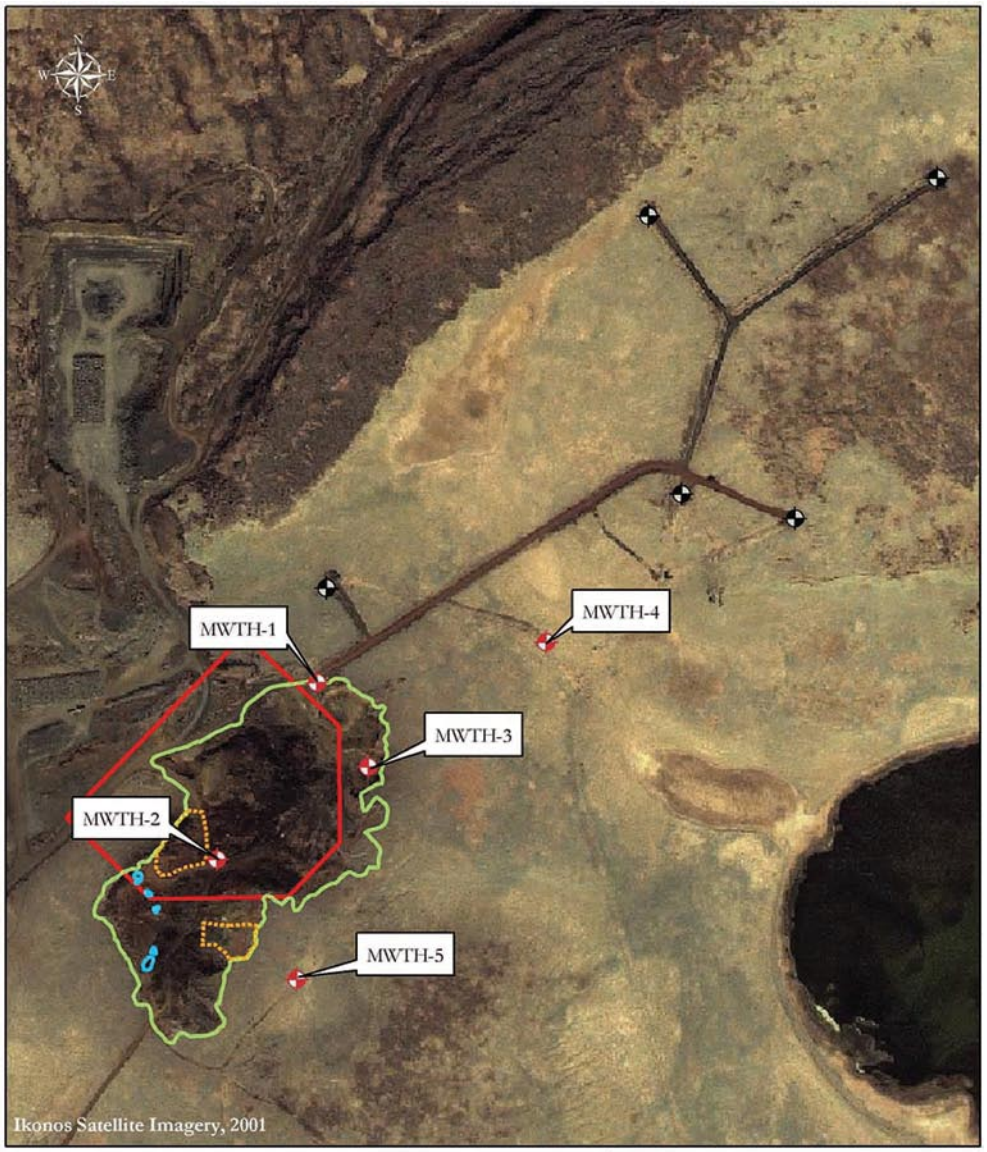


Figure 4. Map of Telegraph Hill Scoria Pit Site (TPA Site No. 15-1) showing the Central, Upper, and Upper-Upper Pads. (Image Source: CESI, 2002)

Pribilof Islands Restoration Project



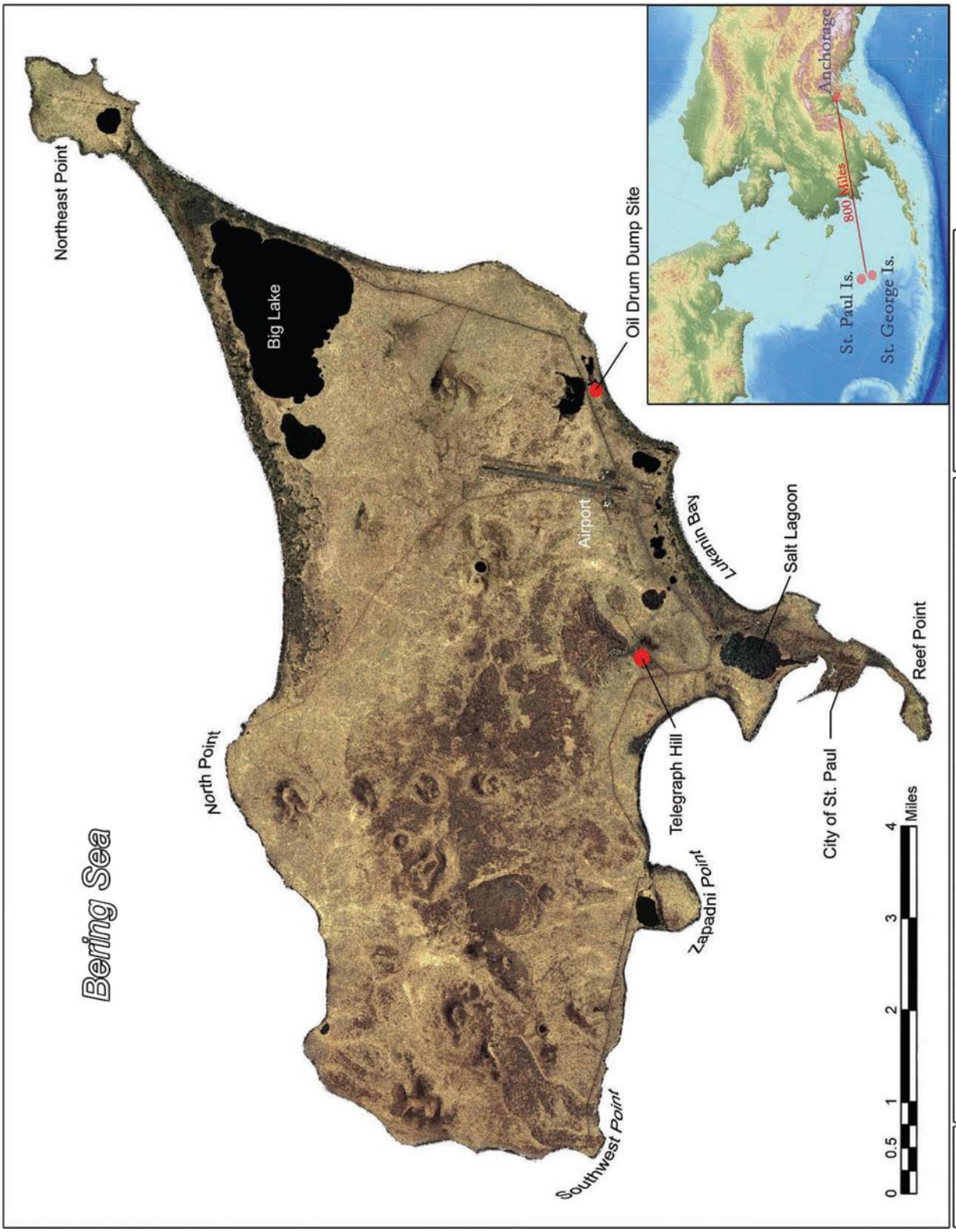
0 75 150 300 Meters

Pribilof Islands Restoration Project

Figure 5. Groundwater Sampling Locations at Telegraph Hill Scoria Pit Site (TPA Site No. 15-1).

Legend

- Monitoring Well Locations (CESI 2002)
- St. Paul City Drinking Water Wells
- NOAA Tract 37 Boundary
- Potential Buried Debris Fields
- Scoria Pit Perimeter (Nortech 2001)
- Drum Excavation Areas (Nortech 2001)



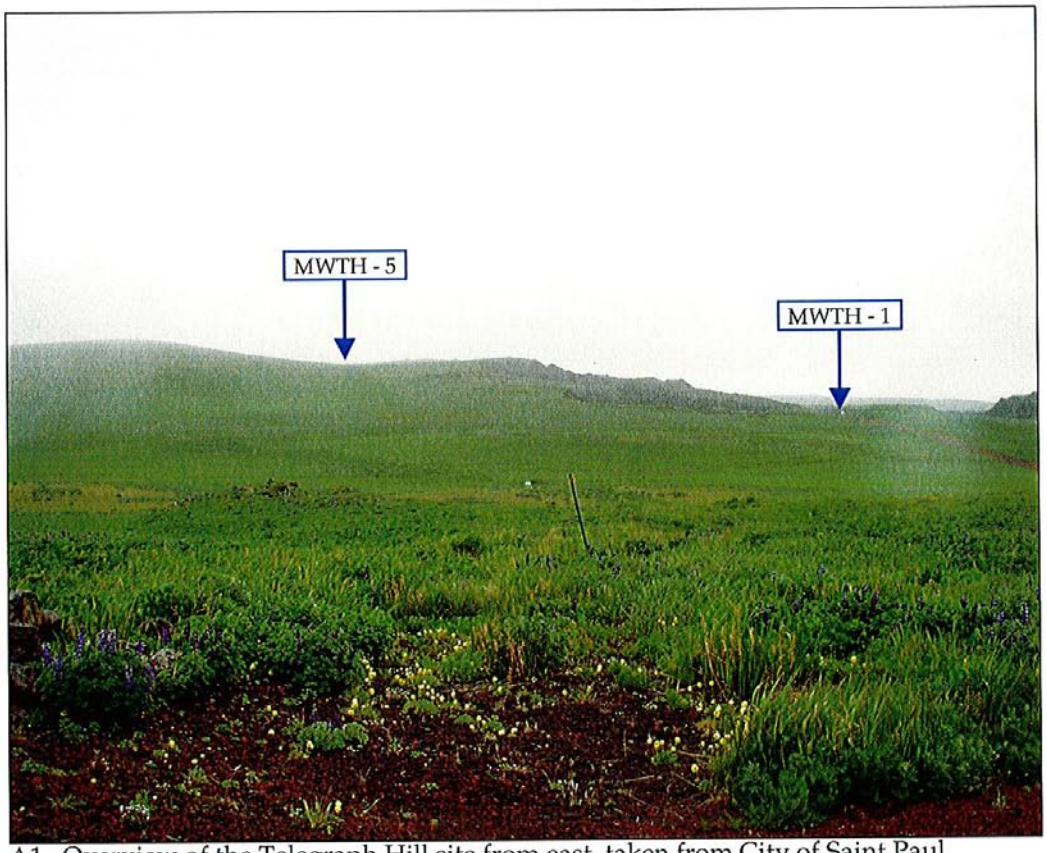
Source: Ikonos Satellite Imagery, 2001

Pribilof Islands Restoration Project

Figure 6

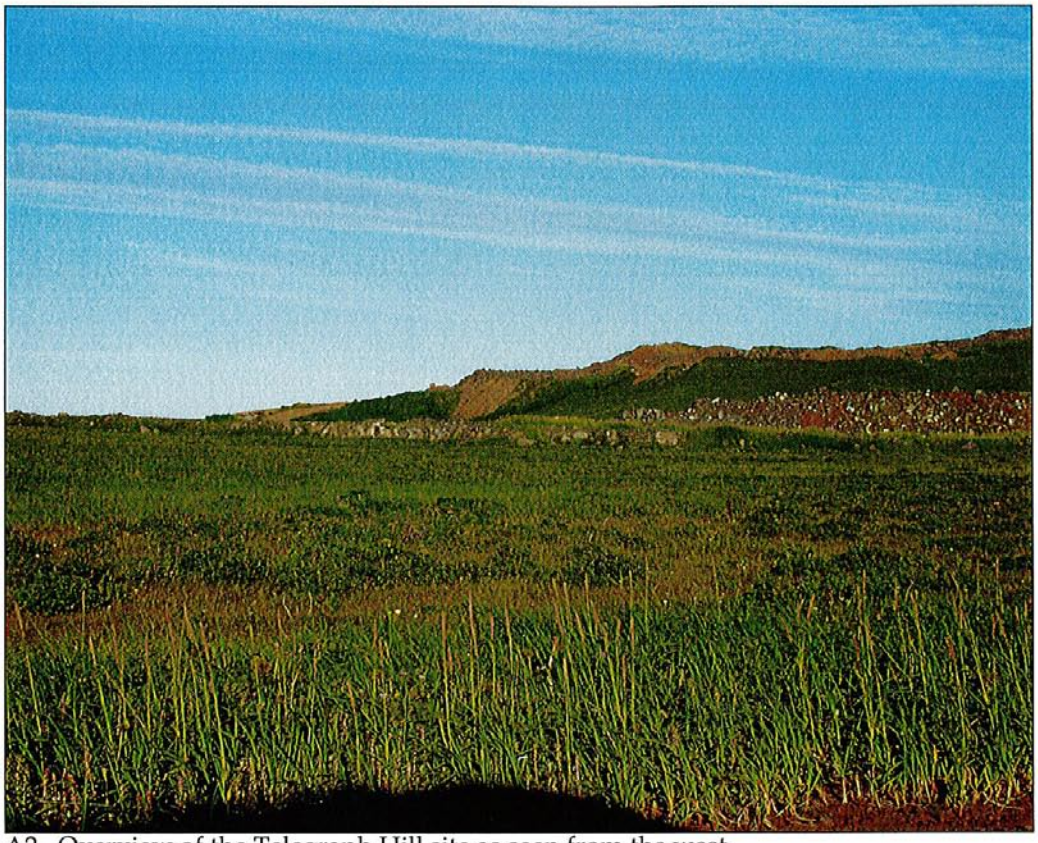
St. Paul Island Vicinity Map
Telegraph Hill and the Oil Drum Dump Site
St. Paul Island, Alaska

Appendix A: Project Photography



A1. Overview of the Telegraph Hill site from east, taken from City of Saint Paul wellfield. The site extends from the saddle on the ridge at left center (the location of MWTH - 5) to the area where the road at right meets the scoria pit (the location of MWTH - 1). MWTH - 4 is located near the white box (to the left of the stake) near the center of the photograph.

Photo ID:	CESI1016
File ID:	P7110004
Date:	7/11/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	15-Scoria Pits
Site:	Telegraph Hill
View:	West



A2. Overview of the Telegraph Hill site as seen from the west.

Photo ID:	CESI1752
File ID:	P8140041
Date:	8/14/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	15-Scoria Pits
Site:	Telegraph Hill
View:	East

A3. Overview of the Telegraph Hill site as seen from the north.

Photo ID:	CESI1080
File ID:	P7180008
Date:	7/18/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	15- Scoria Pits
Site:	Telegraph Hill
View:	South

A4. Overview of northeastern portion of site. MWTH - 1 is located near the white sign at the left of the photograph near the road. MWTH - 3 is located at the base of the pit to the right of the photograph (both wells are highlighted with blue arrows). The City of Saint Paul wellfield is in the background.

Photo ID:	CESI1078
File ID:	P7180006
Date:	7/18/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	15- Scoria Pits
Site:	Telegraph Hill
View:	Northeast

A5. Upper pad at Telegraph Hill. Three soil borings were constructed here after a series of drums were removed from the upper pad. Note the orange clay layer in outcrop to the left of the vehicle.

Photo ID:	CESI1627
File ID:	P8100048
Date:	8/10/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	15- Scoria Pits
Site:	Telegraph Hill
View:	West

A6. Drum fragments on the central pad of Telegraph Hill. MWTH – 2 is highlighted with a blue arrow in the upper right of the photo. The City of Saint Paul wellfield is in the upper left background.

Photo ID:	CESI01566
File ID:	P7230015
Date:	7/23/01
Photo By:	Fraser (CESI)
Island:	Saint Paul
TPA ID:	15- Scoria Pits
Site:	Telegraph Hill
View:	East

A7. Upper-upper pad at Telegraph Hill. Two soil borings were constructed here following drum removal.

Photo ID:	CESI1623
File ID:	P8100044
Date:	11/17/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	15- Scoria Pits
Site:	Telegraph Hill
View:	East

A8. Borehole logging and soil sampling at the upper pad. Drum fragment marked with flag in foreground. Note clay outcrop at left. Drill rig was used in hollow-stem auger mode for three borings on the upper pad.

Photo ID:	CESI1667
File ID:	P8120014
Date:	8/12/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	15- Scoria Pits
Site:	Telegraph Hill; Upper Pad
View:	North

A9. Air rotary drill rig setup shown installing MWTH-2. The City of Saint Paul wellfield is in the upper left background.

Photo ID:	CESI0950
File ID:	P6260008
Date:	6/26/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	15- Scoria Pits
Site:	Telegraph Hill; MWTH-2
View:	Northwest

Appendix H

Correspondence Regarding TPA Site No. 15-1/FUDS C

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ADEC Needs to:

1. Research National Archives regarding these sites.
2. Formally request USACE documentation via FOIA.
3. Investigate "Amchitka" allegations.
4. Conduct & record oral histories from remaining elders, active and retired contractor & USACE personnel.
5. Formally hold USACE responsible for meeting 1980's permit (landfill) and monitoring requirements, as well as requirements for lab analysis results and chain-of-custody records.

Division of Spill Prevention and Response
Contaminated Sites Remediation Program
555 Cordova Street
Anchorage, AK 99501-2617

To	Dave Wuandy	From	Ray Donovan
Company		Date	
Phone No.		Phone No.	
Fax No.	1-206-526-6675	Fax No.	907-269-7649

6. If ADEC did not have regulatory oversight in the 1980's, then ADEC needs to enlist the support of EPA Reg. 10

Number of pages including cover sheet: 2

COMMENTS: We faxed copies of lots of stuff to the Corp. The 1998 letter referred to is the PRP letter I sent NOAA as land owner. So - you're not getting any help from the Corp and this is the reason we need NOAA's help.
Ray D.

DBW 01/29/99

USACE took extreme liberties with the interpretation of both 05 Aug 98 letters from ADEC, one to USACE/DOD FUDS & one to NOAA. The PRP notification to NOAA was based upon NOAA ownership, or part ownership of the lands, and ADEC interpretation of P.L. 104-91. The PRP notification and request for info to USACE/DOD FUDS was based upon the 1985-87 USACE Clean-up and/or burial at 12 sites on St. Paul Island. As best as I can determine, USACE never provided the requested info to ADEC, but requested ADEC provide info/documents which ADEC obtained from USACE & TDX files.
DBWuandy 01/29/99

2517

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

15 JAN 1999

REPLY TO
ATTENTION OF:

Military Programs

Honorable Don Young
House of Representatives
Washington, D.C. 20515

Dear Mr. Young:

This is in response to your November 18, 1998, letter regarding the Department of Defense's (DoD) responsibility for environmental clean up at the Pribilof Islands, Alaska, and specifically Telegraph Hill on St. Paul Island.

As you know, the U.S. Army Corps of Engineers manages the Formerly Used Defense Site program for DoD. In this regard, the Corps has evaluated all known areas of former DoD usage within the pribilofs, and concluded there is no further DoD responsibility.

In 1986 the Corps successfully removed all DoD contamination from Telegraph Hill and ten other sites on the islands to the satisfaction of the community (tribal government and native villages). Any pollution remaining, was determined as non-DoD. In a 1998 letter from the Alaska Department of Environmental Conservation (ADEC) to the National Oceanic and Atmospheric Administration, the ADEC corroborated our evaluation regarding Telegraph Hill, stating that the site was not the responsibility of DoD.

If you have further questions, or desire further details regarding our actions in the Pribilofs please contact our project manager, Mr. Ronald Pflum, at (907) 753-5785.

Sincerely,

William A. Brown, Sr., P.E.
Deputy Director
Directorate of Military Programs

OWENS & TURNER

A PROFESSIONAL CORPORATION

THOMAS P. OWENS, JR.
TERRANCE A. TURNER
WILLIAM F. MEDE
SCOTT J. NORDSTRAND
ERIN ROSE
PATRICK J MCCABE
KIMBERLY K. GEARIETY
DENNIS J. EFTA

ATTORNEYS AT LAW
1500 WEST 33RD AVENUE, SUITE 200
ANCHORAGE, ALASKA 99503-3502

TELEPHONE
(907) 276-3963
FACSIMILE
(907) 277-3695

FACSIMILE TRANSMISSION

TO:	U.S. Department of Commerce Western Administrative Support Center National Oceanic and Atmospheric Administration Attn: Niel B. Moeller	(206) 526-6542
	Dept. of Justice/Environmental & Natural Resources Division Attn: Dean K. Dunsmore	271-5827
	Douglas F. Strandberg	(360) 378-6573

FROM: Terrance A_ Turner

DATE: November 20, 1998

SUBJECT: *TDX/City Settlement Agreement Lit,* 3 *70-025*

This transmission comprises pages, including this cover sheet. If you do not receive all of the pages, please call Lisa at *Owens* & Turner (276-3963).

31

OWENS & TURNER
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
1500 WEST 33RD AVENUE, SUITE 200
ANCHORAGE, ALASKA 99503-3502

THOMAS P. OWENS, JR.
TERRANCE A. TURNER
WILLIAM F. MEDE
SCOTT J. NORDSTRAND
ERIN ROSE
PATRICK J. MCCABE
GREGORY S. FISHER
KIMBERLY K. GEARIETY

TELEPHONE
(907) 276-3963
FACSIMILE
(907) 277-3695

November 20, 1998

Facsimile transmitted to (206) 526-6542

U.S. Department of Commerce
Western Administrative Support Center
National Oceanic and Atmospheric Administration
7600 Sand Point Way N.E., BIN C15700
Seattle, Washington 98 115

Attention: Niel B. Moeller, Attorney for NOAA

Re: Tanadgusix Corporation's ("TDX") refusal to presently accept conveyance of Telegraph Hill Borrow Pit from National Oceanic and Atmospheric Administration ("NOAA")

Dear Niel:

This letter is to advise you of the reasons why TDX presently refuses to accept conveyance of the Telegraph Hill Borrow Pit ("Telegraph Hill") from NOAA pursuant to Paragraph 5(e) of the Transfer of Property on the Pribilof Islands: Descriptions, Terms and Conditions, dated February 10, 1984 ("TOPA").

As you are aware, recent correspondence between the State of Alaska, Department of Environmental Conservation ("ADEC"), Army Corps of Engineers ("Corps")! U.S. Department of Defense ("DOD") and NOAA indicates that the Telegraph Hill site contains in excess of 125 buried drums! which appear to contain Toxic Hazardous and/or Extremely Hazardous Substances that may be leaking into the environment_ In NOAA's most recent position statements with respect to the Telegraph Hill site, NOAA has refused to respond to, access, remediate or clean up any such environmental pollution, even though:

(a) Telegraph Hill is listed as a site to be remediated under the "Two-Party" Environmental Restoration Agreement between ADEC and NOAA;

(b) for all relevant periods NOAA has been the unquestioned owner of such site;

(c) PL 104-91 provides as follows in pertinent part:

> . . . The Secretary of Commerce shall . . . clean up landfills, wastes, dumps, debris, storage tanks, property, hazardous or unsafe conditions? and contaminants, including petroleum products and their derivatives, left by the National Oceanic and Atmospheric Administration on lands which it and its predecessor agencies abandoned, quitclaimed, or otherwise transferred or are obligated to transfer, to local entities or residents on the Pribilof Islands, Alaska pursuant to the Fur Seal Act of 1966, as amended ...;

(d) ADEC has reviewed historic records that appear to tie the buried drums at the Telegraph Hill site to past operations of NOAA or its predecessor agencies at St. Paul Island; and

(e) ADEC suspects that pollution from Telegraph Hill may be leaching into the St. Paul aquifer based on contaminant readings recently discovered in the monitoring wells associated with the St. Paul public drinking water system.

If TDX were to accept title to Telegraph Hill from NOAA prior to the resolution as to which federal agency has ultimate responsibility to respond to, assess, remediate and clean up the environmental pollution at such site, TDX could become a potentially responsible party liable for assessment and clean up costs under applicable state and federal environmental laws. TOPA does not require TDX to accept such a risk; and it is clearly the intent of TOPA and PL 104-91 that NOAA, as the federal steward of TDX' TOPA lands, convey them IO TDX in an environmentally clean and safe condition.

As the Native Village Corporation for the Aleut community of St_ Paul Island, TDX has an obligation to protect its shareholders from the potential human health! environmental and financial hazards associated with the Telegraph Hill site. Therefore, until NOAA (a) resolves its existing dispute with DOD and the Corps over environmental liability at Telegraph Hill, and (b) assures that the appropriate government agency(ies) adopt a plan to respond to, assess, remediate and clean up such site that is similar in scope and content to the plans NOAA has in place for other sites of known or suspected environmental pollution on TDX' TOPA lands, TDX refuses to accept conveyance of the Telegraph Hill site from NOAA.

In the meantime, TDX is suffering, and will continue to suffer, substantial monetary damages as a result of its inability to accept this valuable site, which it may seek to recover in the Court of Claims from NOAA. The only way that NOAA can reduce its exposure to such damages will be to (a) promptly take the action referred to in the immediately preceding paragraph or (b) to offer TDX substitute lands of equivalent value.

Please promptly advise TDX in writing as to what course of action NOAA intends to take to mitigate this serious environmental problem.

Very truly yours,

OWENS & TURNER, P.C.
Attorneys for Tanadgusix Corporation

Terrance A. Turner

TAT/mm

cc: Tanadgusix Corporation (Hand delivered)
Attn: Ron Philemonoff, Chairman and Chief Executive Officer
Attn: Victor Merculief, Vice President Lands and Resources

Department of Justice, Environmental & Natural Resources Division
Attn: Dean K. Dunsmore Facsimile transmitted to 271-5827

370-018\moeller.002

TOTAL P.04

11/20/98 13:40 NOAA OFFICE OF LEG. AFFAIRS → 1206526660 NO.513 P001

OPTIONAL FORM 99 (7-90)

11/20/98 11:58 ☎202 226 0200 002/002

FAX TRANSMITTAL # of pages ▶ 2

To Kelly Sandy	From T. Legatski
Dept./Agency	Phone # 202/482-4638
Fax # 206/526-6660	Fax # 202/482-4960

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

U.S. Ho

Committee on Resources
Washington, DC 20515

November 18, 1998

Honorable Joseph W Westphal
Assistant Secretary (Civil Works)
Department of the Army
Room 2E570, **The Pentagon**
Washington, D C. 203 IO-0 **108**

Dear Secretary Westphal :

I **am** writing to advise you that the Department of **Defense** (DOD), **through the Corps of** Engineers, appears to be **responsible** for environmental cleanup **at one or more formerly-used** defense sites on the Pribilof Islands (Sc Paul and St. George), **Alaska. and to ask** for your personal **attention** to **these sites** to ensure their prompt and complete cleanup and remediation.

The Natioanl Oceanic **and Atmospheric Administration (NOAA) is in** the **midst of a multi-year, $25+** million environmental restoration and cleanup project on the **lands that are or were under its jurisdiction, This is part** of a **larger effort to transfer control on** the Islands from Federal to local control. **That effort results** from the **demise of the Federal fur seal** harvest on the **Islands**. The Coast Guard is also **undertaking a cleanup of** property that it controlled.

The Corps of Engineers has previously acknowledgedresponsibility for **a site known as** Telegraph Hill *on St* Paul Island Unfortunately, the Corps has not scheduled the cleanup of **this site. The use of St. Paul and St. George** by DOD for defense purposes over **a** number of years suggests **that there may be** other sites on the Islands for which DOD should accept responsibility and **undertake cleanup and remediation** actions.

The **State of Alaska and the residents** of **the** Pribilof **Islands are anxious to complete the cleanup of** Federal sites. To enhance **the Islands'** private sector economy, cleanup of all Federal sites is needed. **Please** advise me at your earliest opportunity of the cleanup and remediation schedule for Telegraph Hill; rhe evaluation of DOD's potential responsibility **for other sites on the Pribilofs;** and the plan for resolving environmental problems at those sites

Thank you **for** your consideration I look forward to hearing from you,

Sincerely,

Don Young

DON YOUNG
Chairman
Committee on Resources

33

http://www.house.gov/resources/

John Halverson
FYI

UNITED STATES DEPARTMENT OF COMMERCE
National oceanic and Atmospheric Administration
OFFICE OF THE GENERAL COUNSEL,
Washington, D.C. 20230

RECEIVED
OCT 13 1998
DEPT. OF ENVIRONMENTAL CONSERVATION

October 6, 1998

Mr. Ray Dronenburg
Pribilof Project Manager
Alaska Department of Environmental Conservation,
Division of Spill Prevention and Response
Contaminated Sites Remediation Program
555 Cordova Street, 2nd Floor
Anchorage, AK 9950 1-26 17

RE: Summary Of NOAA Position re Telegraph Hill and Monitoring Wells

Dear Mr. Dronenburg:

I am writing to summarize the position of the National Oceanic and Atmospheric Administration (NOAA) as articulated on the September 17, 1998 Telegraph Hill Potentially Responsible Party (PRP) conference call. In the first instance, let me state my objection to having counsel for TDX Corporation present during that meeting. I am not aware that TDX has been named as a PRP in this issue. In addition, I am not aware of their designation as the Remedial Advisory Board representative. I find the State's alignment with TDX on this matter, as evidenced by their presence at the meeting and TDX' assumed role as an enforcement authority, to constitute a serious impropriety.

With regard to the subject of monitoring wells at Telegraph Hill and NOAA's responsibility there, let me restate our position. The Two Party Agreement NOAA has with ADEC is designed to permit the assessment, remediation (as necessary) and closure of sites identified in Appendix A of the Agreement. Primarily, the work designated in the Appendix of the Agreement calls for site investigation where appropriate, debris and stained-soil removal, landfill closure, and above- and below-ground tank removal. The agreement was reached so that the United States government, through NOAA, could address alleged contamination remaining as a result of the Federal government's fur seal operations on the Pribilof Islands. As the signatories could reach no agreement as to applicable authority for cleanup absent any finding of contamination, it was decided that the following process would be used to assess and address unsightly and potentially contaminated areas at sites in the Appendix:

1) Preliminary Source Evaluations to determine whether or not a source area poses an unacceptable risk to public health or the environment (a screening mechanism assessing existing information or using focused field sampling)

39

2) The submission of site investigation work plans for expanded site investigation(ESI) where there is suspected contamination

3) Performance of the ES1

4) The submission of a corrective action plan for areas requiring remediation to reach cleanup levels set forth in paragraphs 2 1-25,

5) Corrective action, and

6) Submission of a corrective action report leading to site closure.

Under the Agreement, this general process is to be followed at sites in the Appendix where the "Remaining Activities" matrix contains a designation for an ESI and cleanup under the terms of the Agreement where contamination is found. At these sites, it could be possible that the site investigation may lead to the installation of monitoring wells and soil borings. This is not, however, a prerequisite or mandatory sampling procedure. Nor is it the norm where direct filed sampling provides sufficient information regarding contamination. A conceivable scenario requiring monitoring wells would be where surface sampling is insufficient as all information indicates that contamination has reached groundwater. In addition, monitoring wells may be required for landfill closure or in conjunction with underground storage tanks where contamination has leached to groundwater.

In addition to sites in the Appendix requiring an ES1 and cleanup under the terms of the Agreement, there are other sites in the Appendix with more discrete, site-specific activities required. These sites, for example, may call for debris and stained soil removal and confirmatory sampling, landfill closure or tank removal. Tbese sites do not follow the same process as set forth above. At these sites, closure is reached when the proscribed remedy or activity listed is completed.

The Telegraph Hill (Scoria Pits) site does not include an ESI or cleanup, but rather is a remedy-specific site. The activities listed call for debris bulking, sampling and removal and the taking of confirmatory samples. As a result, the sinking of monitoring wells goes far beyond the scope of agreed terms. Because drums marked "U.S. Army" were visibly present at this site, ADEC agreed at the time of signature of the Agreement that the ACOE/FUDS/DOD process was the fair and correct avenue to pursue for these sites. Accordingly, remediation of those sites was left out of the Two-Party Agreement and ADEC agreed to pursue an independent course of action at those sites. It is still NOAA's position that this is the appropriate action to take.

NOAA's Pribilof Project Manger recently proposed to ADEC a comprehensive sampling plan that would rely on monitoring wells to assess contamination across a number of sites. While not mandatory, this option might have proved effective at a cost-saving to NOAA. In the course of fleshing out that option, you indicated that no wells would be needed at the Ice House Lake site and asked that NOAA instead place those wells at the Telegraph Hill site which is a Formally Used Defense site (FUDS). Your proposal represents a substantive change tothe

terms of our Agreement by suggesting we swap NOAA sites for DOD sites; this is equivalent to swapping apples for oranges. I can appreciate your apparent dissatisfaction with the ACOE's responsiveness on FUDS issues, but this arrangement is unacceptable as it would complicate NOAA's responsibilities under the term of our Agreement. To avoid future confusion, NOAA will henceforth adhere strictly to the terms of the Agreement. Accordingly, we will no longer be proposing the use of monitoring wells and will sink them only as required for landfill closure or where further remediation and investigations require it based on a finding of contamination to groundwater.

For your information, our scope of work for the upcoming remediation work on the Pribilof islands requires our contractor to develop a comprehensive project work plan before we move forward with site remediation. This work plan will address the site confirmation sampling protocol to ensure that applicable regulatory cleanup levels will be achieved to support site closure with no further action required. It is our intention to send this work plan to your agency for review and approval prior to starting of any fieldwork. The Pribilof Management Team in Seattle is currently negotiating with Bering Sea Ecotech on costs to perform the remaining work to accomplish the objectives as outlined in the Agreement. A similar negotiation will take place with Tanaq Corporation on St. George Island, hopefully within the next 60 days.

I trust this clarifies our position succinctly.

Sincerely,

Nancy Briscoe
Senior Counsel for Compliance

cc: Minh Trinh
Dan Strandy
Richard Legastki
Craig O'Connor
Michelle Mayer
Scott R. Marchand
Breck Tostevin

DEPT. OF ENVIRONMENTAL CONSERVATION
Division of Spill Prevention & Response
Contaminated Sites Remediation Program
555 Cordova Street, Second Floor
Anchorage, Alaska 99501-26 17

Telephone:(907)269-7659
FAX:(907)269-7649

August 5, 1998

Mr. Minh Trinh
Pribilof Project Manager
U. S. Department of Commerce, NOAA
Western Administrative Support Center
7600 Sand Point Way, N.E. BIN Cl5700
Seattle, Washington 98 115-0070

Subj: Potential Responsible Party Notification

Dear Minh,

This is to advise you that a pollution incident potentially exists for which the National Oceanographic and Atmospheric Administration (NOAA) may be a liable party. The Alaska Department of Environmental Conservation (ADEC) has documented the potential threat of contamination by oil and other hazardous substances to the acquifer on St. Paul Island, St. Paul, Alaska.

Alaska Statutes 46.03.822 establishes who is liable in a pollution incident. Records available to the Department indicate that NOAA meets these criteria as a person or agency owning or operating the property from which a potential release may have occurred.

As you are aware the State of Alaska is concerned about a US Army Corps of Engineers (ACOE) project that occurred in the 1980's and which involved the clean up and subsequent burial of debris. The ACOE administered the contract (DACA85-86-C-0003, Debris Cleanup & Site Restoration, St. Paul, St. George Islands, AK) with the prime contractor being Chase Construction. This contract was to clean up formally used defense sites (FUDS) associated with WWII and the occupation of St. Paul Island by the U. S. Army beginning in 1942. A review of those records available indicate that soil contamination did exist. Contaminated material which included thousands of 55 gallon drums (many of which were reported leaking) were removed from various locations on the island. Unfortunately records which would indicate that soils at the various locations were cleaned to the satisfaction of the ADEC are not immediately available. Also the Department has not been able to determine from available records that groundwater monitoring in the area of buried debris has been accomplished.

Potentially five (5) sites have been identified which are associated with ACOE actions during the 1980's. These sites are on NOAA property or property that were conveyed by NOAA. (Public Law 104-91 states, in part "The Secretary of Commerce shall clean up landfills, wastes, dumps,

42

debris, storage tanks, property, hazardous or unsafe conditions, and contaminants, including petroleum products and their derivatives, left by the National Oceanic and Atmospheric Administration (NOAA) on lands which it and it's predecessor agencies abandoned, quitclaimed, or otherwise transferred or are obligated to transfer, to local entities or residents on the Pribilof Islands, Alaska.. ." Consistent with the Two-Party Agreement, the Department is requesting that all sites as determined by those data available be added to the agreement and investigation be conducted as appropriate to determine (a) the level of contamination, and(b) appropriate clean up action if required. Site description and location maps are attached for your information. Please note that no action dates have been established at this time.

Please respond in writing within 30 days from the date of this letter addressing your responsible party status and intended actions with respect to these pollution incidents.

Sincerely,

Ray Dronenburg
Pribilof Project Manager

RD/bc G:\EQ-CLER\RDRONENB\NOAAPRP.DOC

Cc: RAB Members
**Bob Chiwis, Corps of Engineers
Laura Ogar, Solid Waste, ADEC

Attachments: (1) List of sites to be added to two party agreement
(2) Site map

** Denotes additional agencies receiving PRP letter with regards to this incident

Site #	Description	Potential Contam.	GW Potential	Suggested Investigation
St Paul Island				
#1	Abandoned Loran Site (Ridge Wall)	Petroleum PCB's	None	DRO/PAH/PCB's
#2	Telegraph Hill Barrel dump	Petroleum	Potential	DRO/PAH
#3	Barrel Dump East of Big Lake Adjacent to Webster Lake	Petroleum	Potential	DRO/PAH
#4	Lake Hill site	Petroleum	Potential	DRO/PAH
$5	Quonset Ruins Near Airport	Petroleum	Potential	DRO/PAH

DEPT. OF ENVIRONMENTAL CONSERVATION
Division of Spill Prevention & Response
Contaminated Sites Remediation Program
555 Cordova Street, Second Floor
Anchorage, Alaska 9950 1-26 17

Telephone:(907)269-7659
FAX:(907)269-7649

August 5, 1998

Mr. Bob Chiwas
FUD Program Manager
U.S. Engineer District, Alaska
P.O. Box 898
Anchorage, Alaska 99506

Subj: Potential Responsible Party Notification and Request for Information – Reply Necessary

Dear Mr. Chiwas:

This is to advise you that a pollution incident has occurred for which the U.S. Army Corps of Engineers (ACOE) may be a liable party. The Alaska Department of Environmental Conservation (ADEC) has documented the potential threat of contamination by oil and other hazardous substances to the aquifer on St. Paul Island, St. Paul, Alaska.

Alaska Statutes 46.03.822 establishes who is liable in a pollution incident. Records available to the Department indicate that the ACOE meets the criteria as a person or agency "arranging for transport, disposal or treatment of a hazardous substance that potential was released."

In the mid 1980's the U.S. Army Corps of Engineers did clean up (Federal Contract DACA85-86-C-0003) surface debris which consisted mainly of 55 gallon drums which potentially contained hazardous waste. An ADEC report dated March 1984 indicated that galvanized barrels similar to a style and type used in the storage and shipment of carbon tetrachloride (CC 14) were present. Records obtained from ACOE indicate that soils contamination was determined to exist (Copy of Conversation Record – DOD Form 27 1, signed by Robert Rozier, which indicated spillage during the clean-up operation had occurred and an odor of POLs was still in soil). A solid waste permit from the State of DEC was issued for the proper burial for debris. The permit called for the installation and monitoring of three (3) monitor wells. Existing information indicates that approximately twelve (12) separate sites were involved in the clean up and subsequent burial. It is believed that these clean up operations conducted by a contractor for the ACOE did take place and impact lands that were and are the responsibility of the National Oceanographic and Atmospheric Administration (NOAA).

43

Based on the information known to date, the Department has determined the following response actions are necessary. The Corps of Engineers is hereby requested to provide the following information:

1. A memo dated 10 December 1986, signed by Delwyn F. Thomas indicates that soils analyses tests were reviewed and determined as "acceptable". The second paragraph for the memo indicates that further appropriate testing was recommended for this site and future sites.

   Please provide testing results

2. Three (3) monitor wells were required under the permit issued for debris burial.

   Please provide exact locations for the monitor wells and any data collected from those wells.

3. Approximately twelve (12) sites were involved in the St. Paul clean up.

   Please provide data to substantiate clean up standards were achieved for each site and if no clean up was achieved what action can ADEC anticipate.

The State of Alaska is authorized, under Alaska Statute Title 46, to respond to this pollution incident if response actions are not satisfactory to the Department. In the event that State response actions are necessary, the responsible parties may be held financially liable for any response actions taken by the State. Recoverable costs include salaries of personnel, travel, contracts, legal fees, indirect costs and interest and other costs associated with the response.

Please respond in writing within thirty (30) days from the date of this letter addressing your responsible party status and intended actions with respect to this pollution incident.

Sincerely,

Ray Dronenburg
Pribilof Project Manager

RD/bc GAEQ-CLERiRDRONEN13\CORPSPRP.DOC

Cc: RAB Members
**Mr. Minh Trinh, Project Manager NOAA
John Halverson, FUDS, ADEC
Laura Ogar, Solid Waste, ADEC

* * (person/agency receiving Potential Responsible Party Letter)

STATE OF ALASKA

TONY KNOWLES, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION
DMSION OF SPILL PREVENTION & RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM
555 CORDOVA STREET, SECOND FLOOR
ANCHORAGE, AK 9950 1-26 17

TELEPHONE: (907) 269-7558
FAX: (907) 269-7649

September 14, 1998

Mr. Minh Trinh, Project Manager
NOAA, Western Administrative Support Center
7600 Sand Point Way, N.E.
Seattle, Washington 98 115

Dear Minh,

Your letter of August 27, 1998, in response to my August 5 request that NOAA undertake investigation and any necessary remedial action in five locations where the Army Corps of Engineers undertook work in 1986, has been received.

The Department of Environmental Conservation has made this request as a result of historical research it has conducted concerning past cleanup actions on St. Paul Island as it relates to NOAA's cleanup actions under the Two Party Agreement. Ordinarily such research would be conducted by the responsible party, in this case NOAA, but because NOAA's research position has not been yet filled, the Department undertook some of this work on its own in an effort to keep this project moving.

The Department does not agree with NOAA's position that these sites are not covered by the Two Party Agreement or NOAA's cleanup authorization under Public Law 104-91 for several reasons. First, these St. Paul sites are already included in the Two Party Agreement as #l Oil Drum Dump Site, #2 Vehicle Bone Yard, and ##15 Scoria Pits including Lake Hill, Ridgewall Hill and Telegraph Hill. (See attachment A to Two Party Agreement). Second, NOAA's argument that these are former military sites that must be remediated by the Corps of Engineers ignores the mixed history of these sites and the federal government's overlapping operations on the Pribilof Islands. NOAA and its predecessors created many of these wastes and sites prior to the Army's occupation of the islands during World War II and then after the war continued to use these sites and surplus Army material as part of its fur sealing operations. It simply is not possible to separate the federal government's wastes on the island into neat categories of DOD and non-DOD sites. Indeed, the reality on the ground is that the Department cannot issue no further action letters on these particular sites until questions about the 1986 Corps cleanup actions are resolved.

113

The Department has sought the cooperation of the Army Corps of Engineers in obtaining all of its records on the sites in order to assist NOAA's investigation and any appropriate remediation of these sites under the Two Party Agreement. However under the Two Party Agreement and Public Law 104-91 NOAA is the lead on these sites and the Department therefore reiterates its request that NOAA undertake investigation at these sites as outlined in its August 5 letter. We look forward to meeting with you, your counsel and representatives of the department and the Alaska Attorney General's Office in Anchorage on September 17.

Sincerely,

Ray Dronenburg
Project Manager

RD:el

cc: RAB Members
John Halverson, DOD Coordinator

TONY KNOWLES, GOVERNOR

555 Cordova Street
Anchorage, AK 99501
Phone: (907) 269-7545
Fax: (907) 269-7649
http://www.state.ak.us/dec/

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION & RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

August 27, 1999

U. S. Army Engineer District, Alaska
Attn: CEPOA-PM-E-F (Chivvis)
P.O. Box 898
Anchorage, Alaska 99506

Subject: PRP Notification/Request for site characterization and possible remedial action – St. Paul Island Formerly Used Defense Sites (FUDS)

Dear Mr. Chivvis:

We received the Alaska District's October 23, 1998 letter responding to the potentially responsible party (PRP) letters ADEC sent to on August 5 and September 11, 1998. The latest letter provided additional information on the cleanup work done on St. Paul Island in 1985-86 under the FUDS program. It described the Alaska District's conclusion that all Department of Defense (DOD) impacts to the Island have been "mitigated to acceptable risk based levels and satisfy community concerns" and a decision to "not reopen our remediation". Our Department (DEC) does not agree with the AK District's position that no further work should be done under the FUDS program. Insufficient information has been provided to document that the FUDS were adequately cleaned up. Therefore, the Department of Defenses has out-standing responsibilities for investigation and possibly cleanup on the Island. DEC is requesting that the Corps, as DOD's agent for cleanup at FUDS, conduct additional work under the FUDS Program to complete site characterization and any necessary cleanup.

The National Oceanic and Atmospheric Administration (NOAA), as the federal land manager for the island, is currently investigating and cleaning up areas that have impacts from past federal government activities. NOAA contends that areas in which cleanup work was done under the FUDS program, but which have not resulted in site closure under State regulations, should be brought to closure under the FUDS program. DEC requests that the Corps of Engineers work with NOAA to conduct site characterization and any necessary cleanup in these areas. Working together cooperatively will help ensure a timely and cost effective response.

The 1986 FUDS cleanup project included work on nine separate sites on the island. Based on all the information provided to date, the Corps has not demonstrated that the following areas were adequately characterized, cleaned up or closed: the LORAN Station at Southwest Point - FUDS site A in the '85-86 cleanup, the Oil Drum Dump Site #1 - site B-1 in the FUDS cleanup, the Barrel Dumps north and east of Big Lake - sites B-2 and B-4 in the FUDS cleanup, and the FUDS Landfill created near the Big Polovina Hill Vehicle boneyard.

Telegraph Hill is located in the recharge area for what appears to be a surface influenced sole-source aquifer for the community of St. Paul. The site is directly upgradient from the water supply wells. Periodic petroleum contamination has been documented in the water wells.

FUDS cleanup work at Telegraph Hill included removing what the Corps estimated to be 4000 abandoned drums from approximately two acres of land. At the Oil Drum Dump Site (site B-1) an estimated 4000 drums, 60 tanks and 300 cubic yards of other debris were to be removed. At Drum Dump sites B-2 and B-4 an estimated 650+ drums were reportedly removed.
The contracting documents state that most of the drums had rusted through and spilled their contents. The documents called for cleaning up hazardous spills and sampling to verify the level of cleanup. Site logs produced by the contractor show that some contaminated soil was excavated and transported to the FUDS landfill for disposal. It is unclear what types and concentrations of contaminants were present in the soil that was placed in the landfill. It is unclear whether any site characterization work was done at the former LORAN Station. To date, no documentation has been provided to ADEC to demonstrate that these FUDS were adequately characterized or cleaned up. The October 23 letter from the AK District states, "I canvassed District personnel who may have some knowledge or records on this matter. Unfortunately, we were not able to locate soil or groundwater results."

A December 1991 Preliminary Assessment Report, prepared by DEC, described the 60-70 drums that were documented as being left behind at Telegraph Hill during the FUDS cleanup because they were from a non-military source. However, it also described "drums, crushed drums, and drum debris scattered over the area" along with old pipes remaining at the site. An AK District trip report, Saint Paul (Sanders, May 1996) documents that residual soil contamination and old crushed drums remain at Telegraph Hill. It states that the drums were rusted and that it was not possible to define the origin of the drums, with the exception that one may have been a Shell Oil drum. DEC staff inspected the site again on November 3 and 4, 1998 and again observed drum remnants and other metal debris protruding from the ground at Telegraph Hill.

The October 23 letter refers to a December 10, 1986 memorandum from Delwyn Thomas and concludes that an acceptable level of cleanup was achieved. However, that memorandum states, "... the results indicate that an acceptable level of cleanup has been achieved for those chemicals tested." It also recommended additional testing for polynuclear aromatic hydrocarbons and PCBs. Furthermore, no information has been provided to DEC on the number of samples collected, the sampling locations and the analytical test methods that were or the results of such tests. Therefore, we are unable to concur with the Corps conclusions.

The October 23 letter asserts the AK District's position through twelve *"facts"* based on the information attached to the letter. DEC's further detailed responses are enclosed as attachment 1.

Conclusion

DEC does not agree that FUDS on St. Paul Island have been adequately characterized and cleaned up. DEC requests that the AK District work with NOAA to ensure that all necessary site characterization and cleanup work is completed. This work needs to be done following plans reviewed and approved by DEC, to ensure federal government's (including DOD's) responsibilities are addressed and that the sites are cleaned up to acceptable levels. We request a written response on this matter by September 30, 1999.

Sincerely,

John Halverson
Project Manager

Attachment: DEC response to 12 points raised in Corps Oct. 23, '98 letter

cc: Scott Marchand, AK District Corps of Engineers
Jennifer Roberts, ADEC
Louis Howard, ADEC
John Lindsey, NOAA
Breck Tostevin, AGO

Stpaul7.doc File: FUDS - St. Paul 1999 Correspondence

ATTACHMENT 1
DEC's Responses to *"relevant facts"* the AK District raised its October 23, 1998 letter

1) The Corps letter refers to a recent DOD Site Assessment report as support of its position that no further assessment or cleanup is necessary and that the landowner concurs. The Pribilof Islands Site Assessment Report, prepared for the Office of the Deputy Under Secretary of Defense, March 31, 1998, is a draft report. DEC and the Aleutian Pribilof Island Association both provided comments on the draft stating that concerns over DOD impacts to the Islands have not been adequately addressed. The assessment did not include any sampling or even a trip to the site, but was done through phone calls, letters, and review of historical records (which are incomplete and do not document adequate cleanup). NOAA, as a landowner/manager has clearly stated its position that DOD has further obligations to investigate and cleanup these FUDS.

2) Item number five on page two of the Corps letter states, "Chase Construction was responsible for and did, in fact, arrange for disposal, not the Corps of Engineers. Therefore ADEC has failed to show that the Corps is subject to AS 46.03.822." However, on the contrary, it is very clear that the Corps contracted with Chase Construction to dispose of the DOD waste. Therefore, the Corps is liable under AS 46.03.822(a)(4) which provides that "any person who by contract, agreement or otherwise arranged for disposal . . . of hazardous substances . . ." is strictly liable. The Corps is also liable as a person who arranged for disposal under 42 U.S.C. 9607(a)(3) and 42 U.S.C. 6973.

3) Item number 10 refers to an 1987 letter from DEC which indicated that submittal of photographs or as-built drawings showing the location of the landfill would allow for closing the file on the landfill. However, the photographs or as-built drawings are required under permit condition "H" (Reporting). Groundwater monitoring is required under permit condition "G" (Monitoring). They are separate and distinct requirements that cannot be modified without a written permit amendment (see permit appendix A at A).

4) The letter states that a St. Paul Landfill Closure Report, dated February 1996, and photographs were submitted to DEC to meet closure requirements. However, DEC has received a draft report, dated December 1, 1995, but has no record of receiving a final closure report or the photographs that are referenced. Nor has DEC received groundwater-monitoring data that was required under the permit. Therefore, the landfill is not in compliance with permit requirements and has not been properly closed.

5) Item number 11 states that DEC has not provided any documentation of releases by DOD subsequent to 1986. However, the Corps has failed to demonstrate that it adequately cleaned up releases that were documented before 1986. In fact several people have documented that crushed, rusted drums and soil contamination remain at Telegraph Hill. No documentation has been provided on the types or concentrations of contaminants that were in soil buried in the landfill. The required groundwater monitoring has not been conducted, thus it is unclear whether contaminants are leaching from the waste, impacting groundwater and posing a risk to human health, safety, or welfare or to the environment.

6) Item number 12 states, "Any contamination left at the disposal site was permitted by ADEC and cannot be grounds for further action." Again, to the contrary, the solid waste disposal permit specifically stipulates, in condition "I", "Pollution, as defined in AS 46.03.900, resulting from the operation of this permitted facility, constitutes a violation of this permit . . . Violation of the conditions of this permit may result in the imposition of civil penalties and/or criminal penalties. Additionally, the Permittee may be required to monitor, evaluate impacts, and provide restoration . . .". Since the permit was obtained for, and work was performed under contract to, the AK District for waste under the jurisdiction of the FUDS program and generated during a FUDS cleanup, responsibility for resolving these issues extends to the Corps and ultimately the federal government.

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION & RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

TONY KNOWLES, GOVERNOR
555 Cordova Street
Anchorage, AK 99501
Phone: (907) 269-7545
Fax: (907) 269-7649
http://www.state.ak.us/dec/

December 15, 1999

U. S. Army Engineer District, Alaska
Attn: CEPOA-PM-E-F (Chivvis)
P.O. Box 898
Anchorage, Alaska 99506

Subject: St. Paul Island Formerly Used Defense Sites (FUDS)

Dear Mr. Chivvis:

We received the November 10 letter from Scott Marchand responding to our August 27 potentially responsible party (PRP) notification and request for action letter. The response failed to address the legal and factual information contained in the August 27 letter. The AK District has not addressed Department of Defense liability for disposal of solid and hazardous waste under 42 U.S.C. 9607(a)(3) (CERCLA) and 42 U.S.C. 6973 (RCRA liability for past disposal presenting potential threat to human health or the environment) (see item 2, Attachment 1, in the Aug. 27, 1999 letter). The response failed to address the site conditions, the potential threat to the community drinking water wells and the fact that insufficient documentation has been provided to demonstrate that the past FUDS cleanup work is protective of human health, safety, welfare and the environment. DEC does not agree with the Alaska Districts position regarding DOD's responsibility at these sites.

On December 1, we received a draft No Further Action (NOFA) Report for FUDS work on St. Paul. We were quite surprised by the submittal, especially in light of the fact that the Corps met with DEC, the Army, NOAA and Congressional staff in Washington D.C. in mid November regarding FUDS issues on St. Paul Island. Based on that meeting it was our understanding that staff from the AK District, NOAA and DEC would be meeting in January. The objective of the agreed upon meeting is to discuss the federal government's responsibility for ensuring areas it used on the island are adequately investigated and cleaned up so the land transfers can be completed in accordance with state and federal laws. However, the cover letter on the draft NOFA report requested that DEC provide comments on the document by January 3. It appears that there has been a significant miscommunication on this issue.

DEC does not concur with the proposed NOFA. The document does not address the site information and concerns raised in DEC's previous correspondence. Attached is another copy of our Aug. 27 letter. Until the issues in that letter are adequately addressed, DEC will continue to pursue DOD to ensure it adequately cleans up hazardous substances, pollutants and contaminants from its past activities that may pose a risk to human health, safety. welfare or the environment in Alaska.

I suggest that we schedule a meeting in January, after NOAA provides its next report on work it has conducted on the island, as was agreed upon during the meeting in Washington D.C., to discuss this issue further.

Sincerely,

John Halverson
DOD Oversight Program

Attachment: Aug. 27, 1999 PRP letter on St. Paul FUDS

cc (w/o attachment):
Breck Tostevin, AGO
John Lindsay, NOAA

STPAUL. No-NOFA.doc File: FUDS St. Paul

TONY KNOWLES: GOVERNOR

555 Cordova Street
Anchorage, AK 99501
Phone: (907) 269-7 54j
Fax: (907) 269-7649
http://www.state.ak.us/dec/

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION & RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

August 27, 1999

FILE COPY

U. S. Army Engineer District, Alaska
Attn: CEPOA-PM-E-F (Chivvis)
P.O. Box 898
Anchorage, Alaska 99506

Subject: PRP Notification/Request for site characterization and possible remedial action – St. Paul Island Formerly Used Defense Sites (FUDS)

Dear Mr. Chivvis:

We received the Alaska District's October 23, 1998 letter responding to the potentially responsible party (PRP) letters ADEC sent to on August 5 and September 11. 1998. The latest letter provided additional information on the cleanup work done on St. Paul Island in 1985-86 under the FUDS program. It described the Alaska District's conclusion that all Department of Defense (DOD) impacts to the Island have been "mitigated to acceptable risk based levels and satisfy community concerns" and a decision to "not reopen our remediation". Our Department (DEC) does not agree with the AK District's position that no further work should be done under the FUDS program. Insufficient information has been provided to document that the FUDS were adequately cleaned up. Therefore, the Department of Defenses has out-standing responsibilities for investigation and possibly cleanup on the Island. DEC is requesting that the Corps, as DOD's agent for cleanup at FUDS. conduct additional work under the FUDS Program to complete site characterization and any necessary cleanup.

The National Oceanic and Atmospheric Administration (NOAA), as the federal land manager for the island, is currently investigating and cleaning up areas that have impacts from past federal govemment activities. NOAA contends that areas in which cleanup work was done under the FUDS program, but which have not resulted in site closure under State regulations, should be brought to closure under the FUDS program. DEC requests that the Corps of Engineers work with NOAA to conduct site characterization and any necessary cleanup in these areas. Working together cooperatively will help ensure a timely and cost effective response.

The 1986 FUDS cleanup project included work on nine separate sites on the island. Based on all the information provided to date, the Corps has not demonstrated that the following areas were adequately characterized, cleaned up or closed: the LORAN Station at Southwest Point - FUDS site A in the '85-86 cleanup. the Oil Drum Dump Site #l - site B-l in the FUDS cleanup. the Barrel Dumps north and east of Big Lake - sites B-2 and B-4 in the FUDS cleanup. and the FUDS Landfill created near the Big Polovina Hill Vehicle boneyard.

Telegraph Hill is located in the recharge area for what appears to be a surface influenced sole-source aquifer for the community of St. Paul. The site is directly upgradient from the water supply wells. Periodic petroleum contamination has been documented in the water wells.

,FUDS cleanup work at Telegraph Hill included removing what the Corps estimated to be 4000 abandoned drums from approximately two acres of land. At the Oil Drum Dump Site (site B-l) an estimated 4000 drums 60 tanks and 300 cubic yards of other debris were to be removed. At Drum Dump sites B-2 and B-4 an estimated 650+ drums were reportedly removed.
The contracting documents state that most of the drums had rusted through and spilled their contents. The documents called for cleaning up hazardous spills and sampling to verify the level of cleanup. Site logs produced by the contractor show that some contaminated soil was excavated and transported to the FUDS landfill for disposal. It is unclear what types and concentrations of contaminants were present in the soil that was placed in the landfill. It is unclear whether any site characterization work was done at the former LORAN Station. To date, no documentation has been provided to ADEC to demonstrate that these FUDS were adequately characterized or cleaned up. The October 23 letter from the AK District states, "I canvassed District personnel who may have some knowledge or records on this matter. Unfortunately, we were not able to locate soil or groundwater results."

A December 199 1 Preliminary Assessment Report, prepared by DEC, described the 60-70 drums that were documented as being left behind at Telegraph Hill during the FUDS cleanup because they were from a non-military source. However, it also described "drums, crushed drums, and drum debris scattered over the area" along with old pipes remaining at the site. An AK District trip report. Saint Paul (Sanders. May 1996) documents that residual soil contamination and old crushed drums remain at Telegraph Hill. It states that the drums were rusted and that it was not possible to define the origin of the drums, with the exception that one may have been a Shell Oil drum. DEC staff inspected the site again on November 3 and 4, 1998 and again observed drum remnants and other metal debris protruding from the ground at Telegraph Hill.

The October 23 letter refers to a December 10, 1986 memorandum from Delwyn Thomas and concludes that an acceptable level of cleanup was achieved. However, that memorandum states, "... the results indicate that an acceptable level of cleanup has been achieved for those chemicals tested." It also recommended additional testing for polynuclear aromatic hydrocarbons and PCBs. Furthermore, no information has been provided to DEC on the number of samples collected, the sampling locations and the analytical test methods that were or the results of such tests. Therefore, we are unable to concur with the Corps conclusions.

The October 23 letter asserts the AK District's position through twelve "facts" based on the information attached to the letter. DEC's further detailed responses are enclosed as attachment 1.

Conclusion

DEC does not agree that FUDS on St. Paul Island have been adequately characterized and cleaned up. DEC requests that the AK District work with NOAA to ensure that all necessary site characterization and cleanup work is completed. This work needs to be done following plans reviewed and approved by DEC, to ensure federal government's (including DOD's) responsibilities are addressed and that the sites are cleaned up to acceptable levels. We request a written response on this matter by September 30, 1999.

Sincerely,

John Halverson
Project Manager

Attachment: DEC response to 12 points raised in Corps Oct. 23, '98 letter

cc: Scott Marchand, AK District Corps of Engineers
Jennifer Roberts, ADEC
Louis Howard, ADEC
John Lindsey, NOAA
Breck Tostevin. AGO

Stpaul7.doc File: FUDS - St. Paul 1999 Correspondence

ATTACHMENT 1

DEC's Responses to *"relevant facts"* the AK District raised its October 23, 1998 letter

1) The Corps letter refers to a recent DOD Site Assessment report as support of its position that no further assessment or cleanup is necessary and that the landowner concurs. The Pribilof Islands Site Assessment Report, prepared for the Office of the Deputy Under Secretary of Defense, March 3 1, 1998, is a draft report. DEC and the Aleutian Pribilof Island Association both provided comments on the draft stating that concerns over DOD impacts to the Islands have not been adequately addressed. The assessment did not include any sampling or even a trip to the site, but was done through phone calls, letters, and review of historical records (which are incomplete and do not document adequate cleanup). NOAA, as a landowner/manager has clearly stated its position that DOD has further obligations to investigate and cleanup these FUDS.

2) Item number five on page two of the Corps letter states, "Chase Construction was responsible for and did, in fact, arrange for disposal, not the Corps of Engineers. Therefore ADEC has failed to show that the Corps is subject to AS 46.03.822." However, on the contrary, it is very clear that the Corps contracted with Chase Construction to dispose of the DOD waste. Therefore, the Corps is liable under AS 46.03.822(a)(4) which provides that "any person who by contract, agreement or otherwise arranged for disposal .. of hazardous substances ..." is strictly liable. The Corps is also liable as a person who arranged for disposal under 42 U.S.C. 9607(a)(3) and 42 U.S.C. 6973.

3) Item number 10 refers to an 1987 letter from DEC which indicated that submittal of photographs or as-built drawings showing the location of the landfill would allow for closing the file on the landfill. However, the photographs or as-built drawings are required under permit condition "H" (Reporting). Groundwater monitoring is required under permit condition "G" (Monitoring). They are separate and distinct requirements that cannot be modified without a written permit amendment (see permit appendix A at A).

4) The letter states that a St. Paul Landfill Closure Report, dated February 1996, and photographs were submitted to DEC to meet closure requirements. However, DEC has received a draft report, dated December 1, 1995, but has no record of receiving a final closure report or the photographs that are referenced. Nor has DEC received groundwater-monitoring data that was required under the permit. Therefore, the landfill is not in compliance with permit requirements and has not been properly closed.

5) Item number 11 states that DEC has not provided any documentation of releases by DOD subsequent to 1986. However, the Corps has failed to demonstrate that it adequately cleaned up releases that were documented before 1986. In fact several people have documented that crushed! rusted drums and soil contamination remain at Telegraph Hill. No documentation has been provided on the types or concentrations of contaminants that were in soil buried in the landfill. The required groundwater monitoring has not been conducted, thus it is unclear whether contaminants are leaching from the waste, impacting groundwater and posing a risk to human health, safety. or welfare or to the environment.

6) Item number 12 states, “Any contamination left at the disposal site was permitted by ADEC and cannot be grounds for further action.” Again, to the contrary, the solid waste disposal permit specifically stipulates, in condition “I”, “Pollution, as defined in AS 46.03.900, resulting from the operation of this permitted facility, constitutes a violation of this permit ... Violation of the conditions of this permit may result in the imposition of civil penalties and/or criminal penalties. Additionally, the Permittee may be required to monitor, evaluate impacts, and provide restoration ...‘l. Since the permit was obtained for, and work was performed under contract to, the AK District for waste under the jurisdiction of the FUDS program and generated during a FUDS cleanup, responsibility for resolving these issues extends to the Corps and ultimately the federal government.

Appendix I

Chase Construction Daily Quality Control Inspection Reports

1 E. 3rd Avenue
Anchorage, Alaska 99501

DAILY QUALITY CONTROL INSPECTION REPORT

Report #: 8 Date: 5-20-86 Contract #: DACA 85-86-C-0003

Project: DEBRIS CLEANUP & SITE RESTORATION, ST. PAUL & ST. GEORGE ISLAND, ALASKA

Site Inspected: A, C, B-1, B-2, B-3, E-1

1. Work performed today: Continued hauling debris from A & E-1 to disposed site. Continued crushing barrels at B-1. Located newer barrels (not DOD) at site C containing POL products- will stock pile at site B-1 w/others.

2. Inspection performed: None - Held safety meeting - Minutes attached.

3. Deficiencies noted or corrected:

4. Instructions received or given:

5. Remarks: At site B-3 - Mr. Rozier & Mr. Benson lowcate alot more old wood bldgs that appeared to be DOD. Mr. Rozier is looking into this. Also some old barrels.

Contractor's Verification: The above report is completed and correct and all material and equipment used and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

ACKNOWLEDGEMENT:

Quality Control Representative

Project Manager

Form CHASE 101

52

NRC 5

Appendix J

ADEC's Comments on NOAA's July 2004 Draft Site Characterization Report for the Telegraph Hill Scoria Pit Site

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

FRANK H. MURKOWSKI, GOVERNOR

555 Cordova Street
Anchorage, AK 99501
PHONE: (907) 269-7552
FAX: (907) 269-7649
http://www.state.ak.us/dec/home.htm

File No.: 2644.38.030
CS Database reckey No.: 1994250135420

August 24, 2004

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-6349

RE: Telegraph Hill Two-Party Agreement (TPA) Site 15, St. Paul Island, Alaska July 2004

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (the Department) received the above document for review and comment. The Department has reviewed the data and it appears that there is no need for future soil and groundwater remediation at TPA 15 Telegraph Hill (CS Database reckey# 1994250135420). It was mentioned in the document that monitoring for residual range organics (RRO) would be required since the groundwater contamination for RRO was detected above Table C of 18 AAC 75 groundwater cleanup levels.

The document also states: "RRO was detected above the Table C regulatory limit of 1.1 mg/L in samples collected from MWTH-2 and MWTH-3 (Table 3) during September 2001. RRO was not detected above its regulatory limit during earlier groundwater sampling events at this site. Furthermore, RRO was reported in the associated method blank and the RRO results from a field duplicate sample from MWTH-3 were significantly lower and below the Table C regulatory limit." The monitoring results are suspect at 1.5 mg/L RRO due to it being detected in the method blank, the nature of RRO not easily being dissolved in groundwater and earlier sampling results not showing RRO to be an issue, the Department will not be requiring groundwater monitoring for the site.

The Department's determination that no further action is required at TPA 15 Telegraph Hill is equivalent to Section 59 of the Two-Party Agreement "Closure of Sites of Operable Units".

Section 59. At any time while this Agreement is in effect, NOAA may request from ADEC written confirmation that all corrective action has been completed at a site(s) or operable unit(s) in accordance with this Agreement. Within thirty (30) Days of its receipt of such request. ADEC shall:

(1) provide written confirmation that no further corrective action is required at the subject site(s) or operable unit(s): or

(2) deny such request and provide a written explanation of the technical basis on which the request is denied. ADEC shall not deny certification that corrective action is complete at any site(s) or operable unit(s) solely on the basis that post-remedial measures, such as monitoring, shall remain in place for a period of months or years.

Please contact me with any questions or concerns at (907) 269-7552.

Sincerely,

Louis Howard
Project Manager
Federal Facilities Section

cc: Greg Gervais, Pribilof Project Office Seattle, WA

G:\SPAR\SPAR-CS\38 Case Files (Contaminated Sites)\2644 St. Paul Island\2644.38.030 TPA 15-1 Telegraph Hill & other Scoria Pits\24-Aug-2004 TPA 15-1 NFRAP determination.doc

FRANK H. MURKOWSKI, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269–7552
Fax: (907) 269–7649
http://www.state.ak.us/dec/

File No. 2644.38.030.01

February 16, 2005

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-6349

RE: Telegraph Hill Two-Party Agreement (TPA) Site 15-1, St. Paul Island, Alaska

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (the Department) has sent NOAA a letter dated August 24, 2004, which stated "...no need for future soil and groundwater remediation at TPA 15-1 Telegraph Hill." Subsequent to the letter, NOAA has submitted the "Final Site Characterization Report" for TPA 15-1. Nothing in the final report changed the Department's decision. This letter reiterates the Department's decision to officially grant a no further corrective action determination once more, which was stated in the August 2004 letter.

The Department is basing its decision on the most current and complete data provided by NOAA. The Department reserves its rights, under: 18 AAC 75 Oil and Other Hazardous Substances Pollution Control regulations and AS 46.03 to require NOAA to perform additional investigation, cleanup, or containment if subsequent information indicates that: 1) additional contamination, left by NOAA and/or its predecessor agencies, remains at the site, which was previously undiscovered and presents an unacceptable risk to human health, safety, or welfare, or the environment; or 2) the information provided was invalid, incomplete, or fraudulent. Please contact me with any questions or concerns at (907) 269–7552.

Sincerely,

Louis Howard
Project Manager
Federal Facilities Section

G:\SPAR\SPAR-CS\38 Case Files (Contaminated Sites)\2644 St. Paul Island\2644.38.030.01 TPA 15A Scoria Pit Telegraph Hill (FUDS)\16-Feb-2005 TPA 15-1 NFRAP determination.doc

NOAA Site 38
TPA Site 15b: Scoria Pit – Lake Hill
(Scoria Pits, TPA 15; TPA Attachment A)

St. Paul Island, Alaska Request for No Further Action Lake Hill Scoria Pit TPA Site No. 15b 919

Letter from Louis Howard to John Lindsay RE: St. Paul Island Request for No Further Action Lake Hill Scoria Pit TPA Site No. 15b. Dated April 3, 2003 943

St. Paul Island, Alaska
Request for No Further Action
Lake Hill Scoria Pit
TPA Site No. 15b

Site: Lake Hill Scoria Pit, Two-Party Agreement (TPA) Site Number 15b, a Subsite of TPA Site No. 15, Scoria Pits. TPA Site No. 15 consists of Telegraph Hill, Lake Hill, and Ridge Wall Scoria Pits.

Location: St. Paul Island, Alaska, approximately 800 miles southwest of Anchorage in the Bering Sea. TPA Site No. 15b is located within Tract B, U.S. Survey 4943, Township 35 South, Range 131 West of the Seward Meridian, Alaska (BLM 1986). It is within the Lake Hill Complex of four volcanic craters. It is within the eastern portion of St. Paul Island, approximately ¾ mile west of the road graded north from the airport, approximately 5.3 miles north-northeast of the City of St. Paul, approximately 1.32 miles to the nearest drinking water well in the City well field, and in the general vicinity of:

Latitude	57° 10’ 33.18”N	
Longitude	170° 14’ 42.21”W	**(Figure 1)**

Type of Release: Abandoned heavy equipment, quarry equipment, empty steel drums, metal and wood debris.

History:
In 1941, there was no development at the Lake Hill Complex, nor any roads to or through this complex. In 1941, not even an airfield existed on St. Paul Island **(Figure 2)**. Prior to World War II (WWII), marine transportation was the sole means of logistical support and personnel transport for the Pribilof Islands.

In 1942, and in response to the invasion and occupation of Aleutian Islands by Japanese Imperial Forces, Pribilovians were evacuated to internment camps in southeast Alaska. U.S Army, U.S. Navy and U.S. Coast Guard units and personnel were deployed to the Pribilof Islands for defensive occupation of both St. George and St. Paul Islands. By 1943, the U.S. Army had planned and constructed a series of facilities on the island. These facilities included construction of roads to and through the Lake Hill Complex, development of storage, bivouac and war fighting facilities **(Figure 3)**. A WWII U.S. Army encampment was located in and around the Lake Hill Complex, including the present quarry, or scoria pit. Following WWII and until the mid-1950s, the U.S. Army and Alaska Territorial Guard used the site.

By Summer 1948, this WWII U.S. Army encampment was deteriorating. Aerial photographs show the location of the scoria pit, as well as debris and numerous abandoned fortified positions, facilities and excavations **(Figures 4 and 5)**.

After WWII, the scoria pit continued to be used as a source of scoria aggregate or gravel. To what extent, it is currently unknown. In December 1976, as the Department of Commerce began the process of conveying management and ownership of island properties under the Fur Seal Act of 1966 and the Alaska Native Settlement Claims Act, the Lake Hill Borrow (Scoria) Pit was designated a “Joint Use Area”. It was to be retained by NMFS subject to joint management, under which the Tanadgusix Corporation (TDX) was allowed to use scoria from the pit free of charge, as long as the pit was under NMFS control, subject to priority use by NMFS (MOU. 1976). On January 19, 1979, the Bureau of Land Management ((BLM) patented surface property rights to TDX and the subsurface property rights to The Aleut Corporation (BLM 50-79-0049 1979 and BLM 50-79-0050 1979).

Circa 1983, airfield upgrades to support the Exxon Petroleum Offshore Survey Support (POSS) camp were completed. Scoria was required for the facilities construction.

In October 1983, the Alaska Department of Environmental Conservation (ADEC) conducted a field visit and literature research of the Community and Island of St. Paul. Neither the field visit, nor the subsequent field and project report addressed the Lake Hill Complex, including the U.S. Army encampment, or the Lake Hill Scoria Pit (ADEC 1984).

Circa 1983, the ADEC obtained photographs of two cranes, two pieces of quarry equipment with conveyors (rock stockpiling equipment), empty drums and miscellaneous wood and metal debris. This was located at the area within the Lake Hill Complex, which would later be designated as TPA Site No. 15b, Lake Hill Scoria Pit. (ADEC, *Circa* 1983). NOAA presumes these photographs acquired from ADEC's files in Anchorage were taken during the 1983 Harmon site survey (ADEC 1984). The equipment and debris is visible in aerial photographs taken in 1993 **(Figures 6 and 7)**, as well as the ca. 1983 photographs **(Figures 8 thru 11)**.

Circa 1984, the Federal Aviation Administration (FAA) installed radome(s) with diesel generators and associated fuel tanks atop Lake Hill. Reportedly, the installation occurred after the downing of Korean Airlines Flight 007 over Sakahlin Island by the Soviet Air Force on September 1, 1983. The FAA radar was to provide coverage over eastern Siberia, Korea and northern China to ensure guidance of commercial aircraft away from potentially dangerous airspace. FAA does not have a license on file to use this land from NOAA, nor has a real estate property transaction occurred transferring this land to the Department of Transportation from the Department of Commerce. Property rights had previously been patented to TDX, surface, and TAC, subsurface.

In 1985, the U.S. Army Corps of Engineers (USACE) had a project on St. George and St. Paul Islands for debris cleanup and site restoration under the Defense Environmental Restoration Account (DERA) program. This USACE-administered DERA program would later transition into the Department of Defense Formerly Used Defense Sites (DOD FUDS) program. The Alaska District, USACE contracted Chase Construction, Inc. (Chase) of Anchorage, Alaska, to complete this project work for the Alaska District, under Contract No. DACA85-86-C-0003. On St. Paul Island, Chase subcontracted the Tanadgusix Corporation to perform the field work. The Alaska District awarded the contract to Chase on November 06, 1985, with field work being completed during 1986. The project work was accepted by the Alaska District on July 10, 1986, and given a satisfactory performance evaluation on August 26, 1987. On St. Paul Island, the contract identified 10 sites for the removal of miscellaneous wood and metal debris, and 55 gallon drum dumps, followed by appropriate site restoration and revegetation. The Lake Hill Complex was designated by USACE as Site B-3, and originally described as "Wooden Structure Near Lake Hill: St. Paul Island A single wooden structure, approximately 16 ft X 20 ft." The DOD, or its predecessor agencies, initially developed all of these sites during WWII (USACE 1991).

While Chase did not identify the Lake Hill site in its *Quality Control Program* written in 1985, in anticipation of its debris cleanup (Chase 1985), a review of Chase's "Daily Quality Control Inspection Report[s]" revealed that USACE representatives on May 20, 1986, "located [sic] a lot more old wood bldgs. that appeared to be DOD. Also some old barrels." A May 23, 1986 report stated, "Investigated surrounding area of site B-3 (Lake Hill). . . There are approx. 35-40 bunkers most of which contain debris plus barrels and other DOD debris in area." On June 17, 1986, Chase reported, "Completed cleanup of debris from sites. . .B-3 and hauled debris to disposal site." On the following day, Chase reported, "New barrel dump and bunker debris on change order. Performed preparatory inspection on new barrel site on 5/28 and on bunkers 6/20 as extra work. Those were not recorded under Inspections performed." Finally on June 20, 1986, Chase reported, "Completed sites. . .B3,. . .new barrel site, and bunkers." As a subcontractor to Chase, TDX submitted a letter to Chase in 1986 stating, "Old bunkers in Lake Hill area and area North of airport. Any structures still standing in these bunkers have been laid flat and all spikes, metal debris and concrete foundations have been removed to the disposal site. Also, any old barrels in the area have been disposed of. The wood will be allowed to remain in the bunkers as it poses no health or safety hazard." (TDX 1986)

In 1991, ADEC personnel conducted a site visit and preliminary assessment (PA) of nine sites on St. Paul Island, during the period July 30 – August 1. These sites were previously listed by DOD under DERA, as being suspected of past uncontrolled hazardous substance disposal. Neither the site visit, nor the subsequent PA report addressed the Lake Hill Complex U.S. Army encampment, nor the Lake Hill Scoria Pit (ADEC 1991 and ADEC 1992).

Circa 1992 – 1993, the Alaska Department of Transportation and Public Facilities completed upgrades and expansion of the St. Paul Airfield. Site survey was initiated in 1989 and the project design was completed between August 23, 1990, and August 13, 1992. The project completion final "As-Built" drawings were signed on January 28, 1994. Scoria aggregate was required to support this project. (ADNR 1989 and ADOT&PF. 1994).

In October 1992, two Ecology And Environment, Inc (E&E) representatives and one U.S. Army Corps of Engineers, Alaska District representative conducted a site visit to St. George and St. Paul Islands. The Lake Hill Complex, Lake Hill Scoria Pit, as well as the future TPA 15b site were visited, photographed and documented. The subsequent PA report it states, "Residents claim that NOAA abandoned heavy equipment at the scoria pits on Lake Hill and Telegraph Hill (see figures 4-2 and 4-5; E&E 1992)."

The PA also states, "Two power shovels, rock stockpiling equipment, and drums remain on the northeast side of the scoria pit at Lake Hill (see Appendix B, photographs 30 and 31). One power shovel is buried with the shovel portion remaining aboveground. The other shovel is fully exposed. No oil is evident in the crankcase at the time of the site visit. Thirteen rusted, empty drums are located approximately 30 feet south of the exposed power shovel and adjacent to the rock stockpiling equipment (E&E 1992)."

Photographs 30 and 31 (E&E 1993), document the same abandoned items and debris photographed *circa* 1983 (Figures 8 thru 12), and in 1993 aerial photographs (Figures 6 and 7). Within the PA, exposure pathways of concern are discussed for the three scoria pits, Lake Hill, Ridge Wall and Telegraph Hill Scoria Pits. However, there is no discussion or indication of any contaminant releases or contaminated soil at the area, which will become TPA Site No. 15b, Lake Hill Scoria Pit. This PA provides the basis for the negotiated designation of TPA Site No. 15, Scoria Pits (E&E 1993).

In 1994, real estate discussions about the future and potential transfer of the U.S. Survey 4943, Tract B, including the Lake Hill Scoria Pit and TPA Site No. 15b, took place between BLM, NOAA, TDX and The Aleut Corporation (TAC). NOAA NMFS had ceased any activities within the Lake Hill Complex by the time of the island's administration and management transfer from the United States Government to local entities in 1983. Nevertheless, the 1994 participants realized that the ongoing quarry operations by island entities had extended the breadth and girth of the scoria pit. Its southern boundaries had grown to extend south of Tract B. BLM had to consider the survey and new legal description to include the "Borrow Pit 5.9 AC Total" within a redesignated parcel not to exceed 15 Acres (BLM 1994).

On January 26, 1996, the Two Party Agreement is signed by all parties, NOAA and the State of Alaska (NOAA 1996). The Lake Hill Scoria Pit site is included in the St. Paul Island TPA Site No. 15, Scoria Pits, designated as an Operating Unit 6 site for petroleum/hazardous substances contamination. Within the site background, it says "Drums and heavy equipment abandoned at two scoria pits (Lake Hill and Telegraph Hill). Within activities or status to date, it says "All unburied drums on Lake and Ridgewall Hill were bulked, sampled, and disposed." However, only the 1985, U.S. Army Corps of Engineers (USACE) Defense Environmental Restoration Account (DERA), or formerly used defense site (FUDS) project removed drums from the Lake Hill Complex. Based upon the circa 1983 photographs, 1992 photographs, 1993 aerial photographs, drums were not removed from the scoria pit site by the USACE DERA contractor. NOAA had not removed any drums from this site, when the TPA was signed. Within the TPA heading of "remaining activities", NOAA was to: "1. Remove machinery hulks/debris/empty drums and take confirmation samples. 2. NOAA to submit letter report with sample results for the site closure."

It should be noted that at the time of signing, NOAA's position was, and still is that this site has a "B Status". This means that NOAA has not acknowledged definite responsibility for this site, believing the U.S. Department of Defense FUDS program still retains responsibility. Based upon visible weathering and corrosion, the drums, equipment and debris shown in the *circa* 1983 photographs and described in the 1992 PA, had been on the site for years. With transfer of Island administration and management duties in 1983, and patenting of the property rights in 1979, NOAA had not been active at Lake Hill since at least prior to 1979. Since Chase did not identify this area in their 1986 documentation, it is unknown whether DOD, NOAA, or both generated this site within the Lake Hill Complex. It is known that the bulk of all cleanup was caused by DOD within the Lake Hill Complex, and DOD had acknowledged the Lake Hill Complex as a DOD FUDS site.

In 1996, NOAA awarded a cooperative agreement (CA), Award No. NA77AB0013, to a joint venture of Bering Sea Eccotech, Inc. (BSE) and Bristol Environmental Services Corporation (BESC), known as Aleutian Enterprises. BSE is a subsidiary of the TDX. TDX was the subcontractor to Chase Construction, which removed the debris from the Lake Hill Complex, under contract to the U.S. Army Corps of Engineers (USACE), Alaska District,

in 1986. As part of the NOAA CA project work, BSE was to remove all abandoned equipment, drums and debris at TPA Site 15b, and conduct confirmation sampling.

In January 1997, BESC conducted a site visit to TPA Site No. 15b, observed and photographed the equipment and debris described by E&E in 1993 (Aleutian Enterprises 1997). After July 13, 1997, and during the summer of 1997, BSE cleared the site. In the project close-out report, BSE stated: "The majority of the debris at this site consisted of old, rock screening and excavation equipment, some of which was partially buried. All of the debris was collected, cut up, and transported to the staging area. No contaminated soils found at this site." As part of this same CA, the debris at the staging area was later shipped off-island to Seattle by barge for recycling, or final disposal. Because BSE did not find any apparent contaminated soils at this site, no confirmation samples were taken (Aleutian Enterprises 1998).

On August 23, 1999, David B. Winandy, NOAA Pribilof Project Office conducted a site visit, inspecting and photographing the site, the scoria pit and the Lake Hill Complex. The TPA Site No. 15b had been cleaned **(Figures 12 thru 16)**. There was no apparent contamination, via visual and olfactory observation. The larger scoria pit was an active quarry, although no quarrying activities were occurring on the day of the site visit. Additional scoria excavation had been occurring as evidenced by the increased depth & breadth of the quarry, as well as by the tracked equipment and wheeled vehicle tracks inside and around the quarry.

In September 1999, NOAA tasked Tetra Tech EM Inc. (TTEMI) to provide independent verification. TTEMI conducted fieldwork at TPA Site No. 15b, under the approved closure confirmation sampling plan (TTEMI 2000). TTEMI reported, "This scoria pit is an active gravel quarry. TTEMI observed no visual evidence of buried or partially buried drums, stained soil, or potentially contaminated soil at the site. TTEMI did not observe any evidence of the debris noted by E&E during the preliminary assessment (E&E 1993) and later removed from the site by Aleutian Enterprises (1997). No environmental samples were collected."

TTEMI recommended, "Based upon field observations conducted during the 1999 field effort, the three scoria pits are all active quarries. No visual evidence of the debris noted at the Lake Hill and Ridge Wall Scoria Pits during previous investigations was noted during the 1999 field effort. In addition, Tetra Tech observed no evidence of stressed vegetation, stained soil, or odors at either site. Because historical removal activities have occurred at these sites, and because the previous and current investigations have not identified any signs of releases from these two sites, Tetra Tech recommends no further action at the Ridge Wall and Lake Hill Scoria Pits."

In 2001, NOAA PPO procured IKONOS satellite imagery of St. Paul Island. In 2002, the digital elevation model (DEM) of the island was completed using this IKONOS imagery. In 2003, the IKONOS imagery was processed. The imagery shows that the TPA 15b debris including, equipment and drums visible in the 1993 aerial photographs had been removed from the site. In comparison between the 1993 and 2001 aerial imagery, additional excavation had occurred within the scoria pit. In 2001, the rim of the scoria pit was at approximately 45 meters (147.6 feet) above mean sea level (MSL), the bottom of the pit was at approximately 36 meters (118.1 feet) above MSL, the water surface of the perched aquifer in the adjacent crater lake was at approximately 34 meters (111.5 feet) above MSL, the depth of the scoria pit was approximately 9 meters (29-1/2 feet), and covered an area of 20,415 square meters (5.045 acres) (NOAA 2002).

Summary of Site Investigations:
ADEC obtained photographs of the site *circa* 1983, documenting abandoned equipment, drums and debris at what was to become the TPA 15b site. USACE and Chase Construction documented drums and debris in the inclusive Lake Hill Complex, St. Paul Island DERA Site B-3, but did not document anything at the TPA 15b site. E&E conducted a preliminary assessment of the site in 1992, six years after the DOD cleanup. E&E documented and photographed two power shovels, rock-stockpiling equipment, and thirteen rusted empty drums on the northeast side of the Lake Hill Scoria Pit. One of the power shovels was partially buried and one was partially exposed. No oil was evident in the crankcase at the time of the 1992 site visit.

Summary of Clean up Actions:
In 1997, Aleutian Enterprises, BSE & BESC, removed all debris from the Lake Hill scoria pit and shipped it off island for disposal. No confirmation samples were taken at that time, as no contaminated soil could be located. In

1999, NOAA PPO inspected and photographed the site. No visual or olfactory evidence of contaminate soil could be found. The site had been extensively excavated. In 1999, TTEMI also observed no visual evidence of buried or partially buried drums, stained soil, or potentially contaminated soil at the site.

In 2001, the scoria pit encompassed 5.045 acres and was approximately 29-1/2 feet deep. Depth to groundwater at the bottom of the pit is an estimated 116 feet. No known documentation or observations provide any indication that the Lake Hill scoria pit site was anything other than a debris site. The site is an active quarry with extensive excavations both horizontally and vertically. No signs of past activities including debris, stained soils, stressed vegetation, or petroleum odors related to NOAA, DOD or their predecessor agencies are evident at this site.

Recommended Action:
Waiver the TPA requirement for confirmation sampling at the site, as there is no identifiable area to sample. In accordance with the waiver and paragraph 59 of the Two-Party Agreement (NOAA 1996), NOAA submits written confirmation that all corrective action has been completed and that no further action is required at TPA Site Number 15b, Lake Hill Scoria Pit.

References:

ADEC. *Circa* 1983. *Photograhs of Abandoned Quarry Equipment, "Bay City" Cranes, Empty Steel Drums and Miscellaneous Debris, Lake Hill Scoria Pit,* Circa *1983*, Pribilof Islands Collection, Alaska Department of Environmental Conservation, Anchorage, AK, Jennifer Donnell Solid Waste Management Division, 2002.

ADEC. 1984. *Field And Project Report, Waste Disposal, St. Paul Island, Conducted October 1 Through 8, 1983*, Carl H. Harmon, File No. 10-1-1983, March 21, 1984, State of Alaska, Department of Environmental Conservation, Southcentral Region.

ADEC. 1991. *Preliminary Assessment Report For St. Paul Island, Pribilof Islands, Alaska*, December 1991, Alaska Department of Environmental Conservation, Juneau, Alaska.

ADEC. 1992. Letter to Corps Of Engineers (Attn: Richard Parrish) from Svend Brandt-Erichsen, ADEC Regional Administrator. January 24, 1992.

ADNR. 1989. *Alaska Land Survey No. 89-101, Platting the St. Paul Airport, May 25 – June 03, 1989, R&M Consultants, Inc.*, Alaska Department of Natural Resources, Division of Land & Water Management, Anchorage, Alaska, August 01, 1989.

ADOT&PF. 1994. *St. Paul Island Airport*, As-Built Drawings, January 28, 1994, State of Alaska, Department of Transportation and Public Facilities.

AeroMap US. 1993. *Aerial Photographs of St. Paul Island*, Summer 1993, AeroMap US, Anchorage, Alaska.

Aleutian Enterprises. 1997. *Final Workplan For Debris And Underground Storage Tank Removals, St. Paul Island, Pribilof Islands, Alaska, Volume I*, May 1997, NOAA Award No. NA77AB0013, BSE Project No. 7029FG-00, Aleutian Enterprises, Anchorage, for National Oceanic and Atmospheric Administration, Seattle.

Aleutian Enterprises. 1998. *Project Close-Out Report, NOAA Debris Cleanup, St. Paul Island, Alaska, 1997, November 1998, NOAA Award No. NA77AB0013, BSE Project No. 7029FG-00, Aleutian Enterprises, Bering Sea Eccotech / Bristol Environmental JV, Anchorage*, for National Oceanic and Atmospheric Administration, Seattle. (Note final report submitted by awardee to NOAA in November 1998, but bears the date of the draft submitted in February 1998.)

BLM 50-79-0049. 1979. *Land Patent Entitlement For the Surface Estate Pursuant to ANSCA, AA-6697-A, to the Tanadgusix Corporation, 462.28 Acres, St. Paul Island, Pribilof Islands, Alaska*, Patent No. 50-79-0049, Bureau of Land Management, Anchorage, Alaska.

BLM 50-79-0050. 1979. *Land Patent Entitlement For the Subsurface Estate Pursuant to ANSCA, AA-6697-A, to the Aleut Corporation, 462.28 Acres, St. Paul Island, Pribilof Islands, Alaska*, Patent No. 50-79-0050, Bureau of Land Management, Anchorage, Alaska.

BLM. 1986. *Master Tile Plat (MTP), Surveyed Township 35 South, Range 131 West of the Seward Meridian, Alaska, Group No. 417 4/1/1986, Status of Public Domain, Land And Mineral Titles, Current to F&WS*, dated Mar 10 1989

BLM. 1994. *Telefax, Lake Hills Borrow Pit, with Survey Drawing & Description, April 27, 1994*, U.S. Department of the Interior, Bureau of Land Management, Alaska State Office, Division of Cadastral Survey, Anchorage.

Chase. 1985. *Quality Control Program For Contract DACA85-86-C-0003*; Debris Cleanup & Site Restoration Environmental Restoration Account, St. Paul Island, St. George Island, Alaska. November 1985.

E&E. 1993. *Final Report, Preliminary Assessment of National Oceanic And Atmospheric Administration Sites, Pribilof Islands, Alaska, Contract No. DACA85-91-D-0003, Delivery Order No. 0027*, February 1993, Ecology and Environment, Inc., Anchorage, for National Oceanic and Atmospheric Administration, Seattle, thru U.S. Army Corps of Engineers, Alaska District, Anchorage.

IKONOS. 2001. *IKONOS Satellite Imagery of St. Paul Island, Alaska*, NOAA Pribilof Project Office, Seattle, 2002.

MOU. 1976. *Memorandum of Understanding among Tanadgusix Corporation, St. Paul Island, Alaska, and Tanaq Corporation, St. George Island, Alaska, and United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, regarding Pribilof Islands Land Selections*, December 22, 1976.

NOAA. 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*. Attorney General's Office File No. 66 1-95-0126, National Oceanic and Atmospheric Administration. January 26, 1996.

NOAA. 1999. *Site Visit Photographs, TPA Site No. 15b, Lake Hill Scoria Pit, David B. Winandy, August 23, 1999*, NOAA Pribilof Project Office, Seattle.

NOAA. 2002. *Digital Elevation Model (DEM), St. Paul Island, Alaska*, NOAA Pribilof Project Office (NOAA PPO), Seattle, 2002.

Scheffer. 1948. *Aerial Photographs, Victor B. Scheffer, Biologist, 1948, U.S. Department of the Interior, U.S. Fish & Wildlife Service*, National Marine Mammal Laboratory Library Collection, Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Western Regional Center, Seattle.

TDX. 1986. Letter from Gregory Fratis, Sr., and Anthony Philemonoff, TDX Corporation, to Chase Construction, Inc., June 18, 1986, Subject: *Questionable Material Which Will Not Be Removed From St. Paul Island Per Contract DACA85-86-C-0003*.

TTEMI. 2000. *Final, Closure Confirmation Report, Telegraph Hill, Ridge Wall, And Lake Hill Scoria Pits, Two-Party Agreement Site No. 15, Pribilof Islands Site Restoration, St. Paul Island, Alaska*, December 18, 2000, Contract No. 50WCNA906018, Modification No. 56WCNA901077, Tetra Tech EM Inc., Seattle, for National Oceanic and Atmospheric Administration, Kansas City.

USF&WS. 1941. *Map, St. Paul Island, Alaska, Scale 1/40,000, Drawn by J.R. Stacy, 1941*, U.S. Department of the Interior, U.S. Fish & Wildlife Service.

U.S. Army Engineer. 1943. *Map, Project Location And General Layout, Airfield And Garrison Site, Sheet No. 1, St. Paul Island, Alaska, Scale 1:20,000, Feb 9, 1943*, U.S. Engineer Office, Anchorage, Alaska, War Department.

USACE. 1991. *Letter with attachments, Subject: Contract DACA85-86-C-0003, Debris Cleanup and Site Restoration, St. Paul and St. George Islands*, June 28, 1991, U.S. Army Corps of Engineers, Alaska District, Construction Operations Division, Anchorage.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

3/25/03
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at TPA Site Number 15b, Lake Hill Scoria Pit, in accordance with the Agreement and that no further action is required.

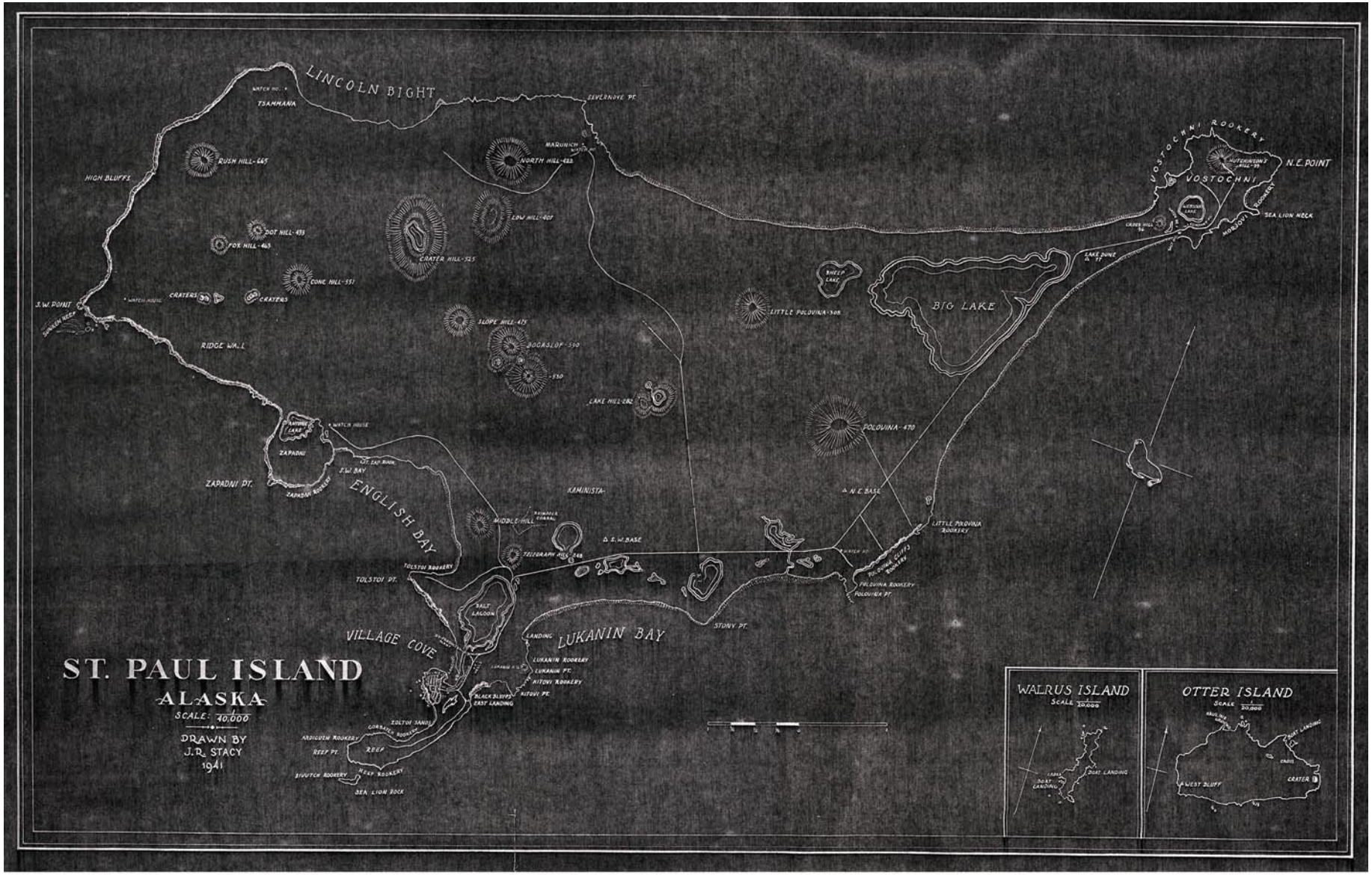
See Attached Letter

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

April 3, 2003
Date

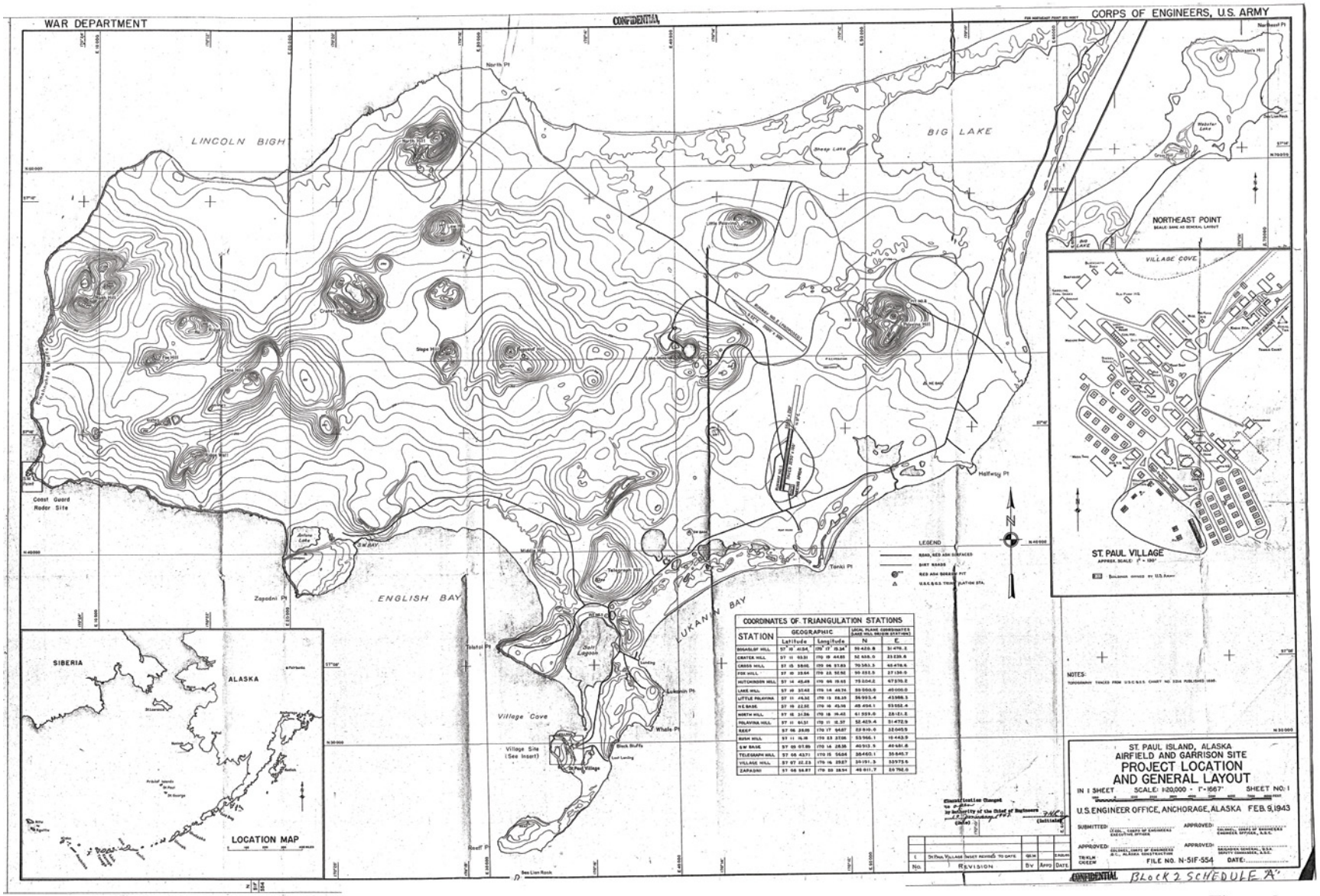

St. Paul Island Vicinity
Figure 1
Anchorage
800 Miles
St. Paul Is.
St. George Is.
St. Paul Airport
TPA Site 15b:
Lake Hill Scoria Pit
City of St. Paul
(Ikonos Satellite Imagery, 2001)
March 17, 2003
N
E
S
W
0
0.5
1
2
3
4
Miles



Pribilof Islands Restoration Project

St. Paul Island Map
1941 (Pre-World War II)
U.S. Department of the Interior
U.S. Fish and Wildlife Service
Note: No road to the summit of Lake Hill Complex

Figure 2
March 17, 2003

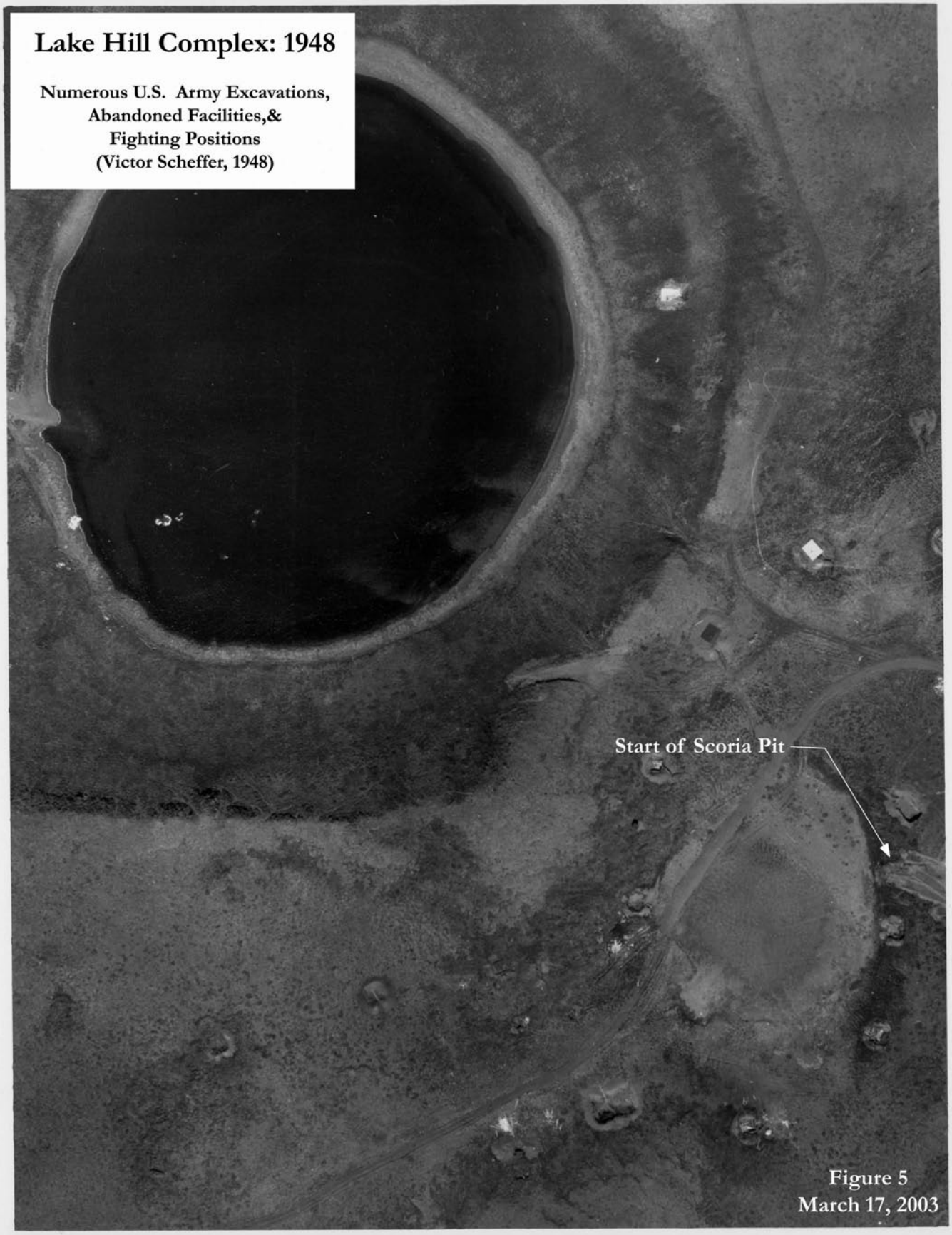


Pribilof Islands Restoration Project

St. Paul Island Map
February 9, 1943
U.S. Army Engineer Office, Anchorage, Alaska
Note: Roads to summit and through Lake Hill Complex,
as well as initial Island Airfield

Figure 3
March 17, 2003

Figure 4
March 17, 2003

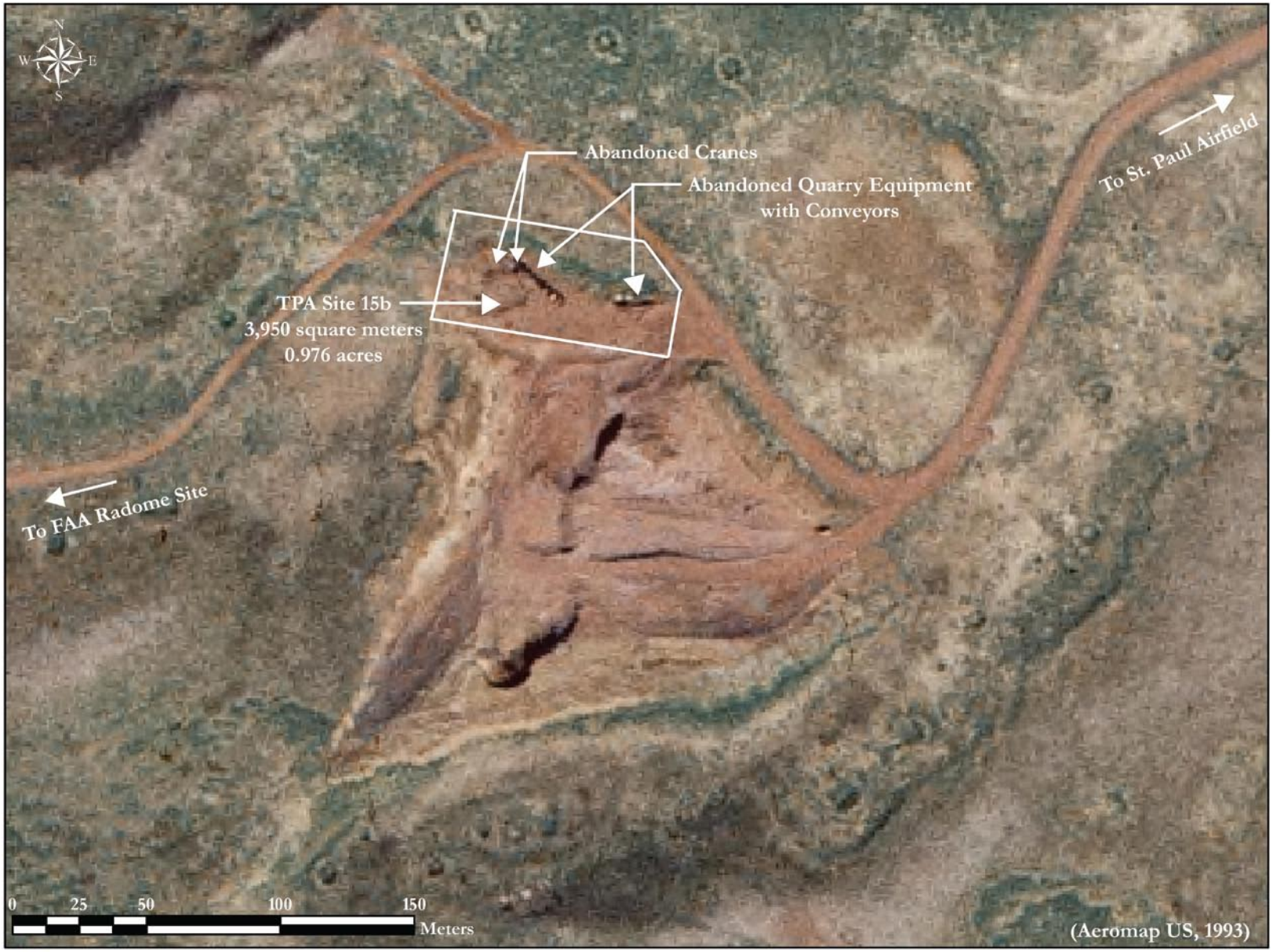

Lake Hill Complex: 1948
Numerous U.S. Army Excavations,
Abandoned Facilities,&
Fighting Positions
(Victor Scheffer, 1948)
Start of Scoria Pit
Figure 5
March 17, 2003

Lake Hill Complex: 1993

Pribilof Islands Restoration Project

Figure 6
March 17, 2003

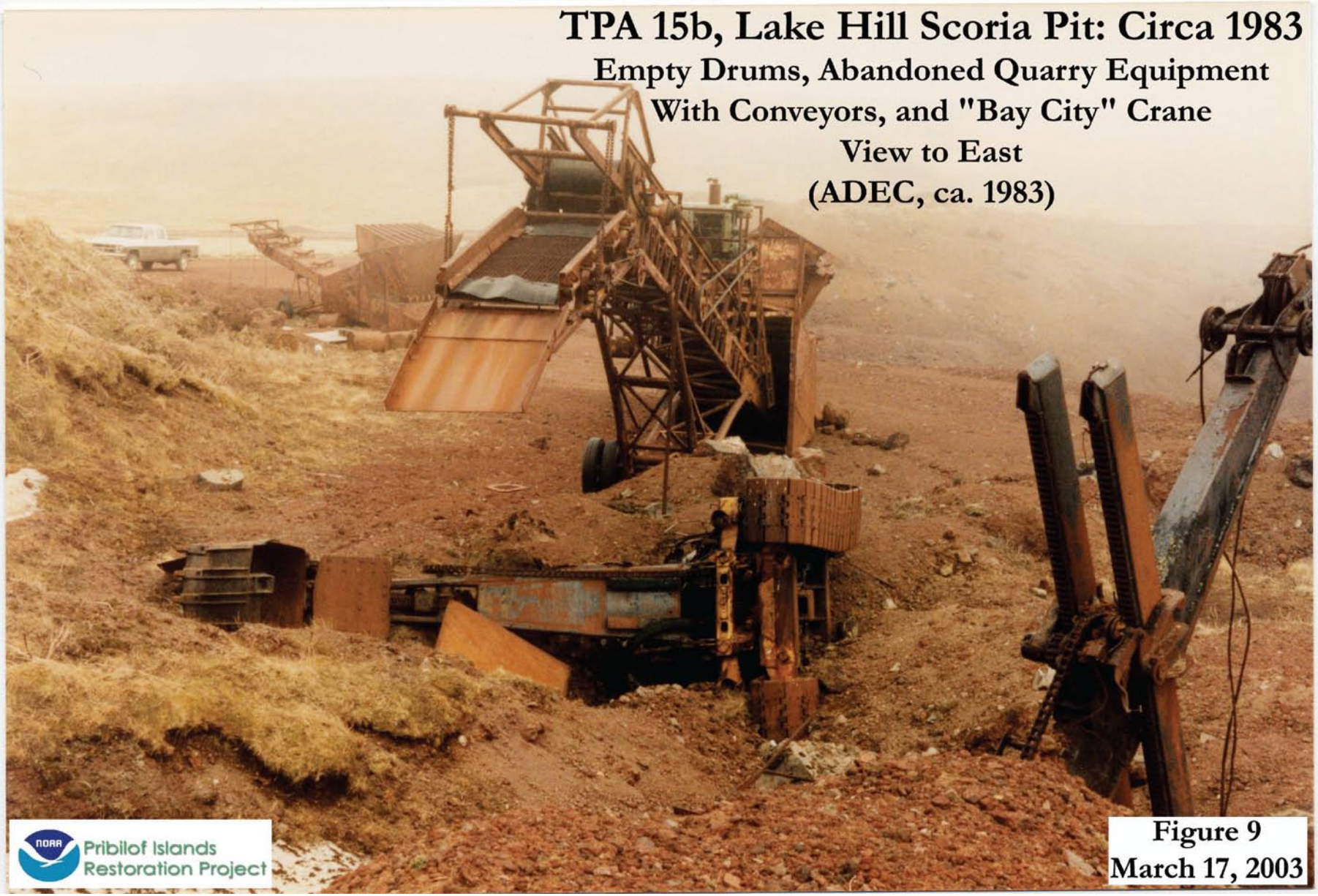
TPA 15b, Lake Hill Scoria Pit: 1993

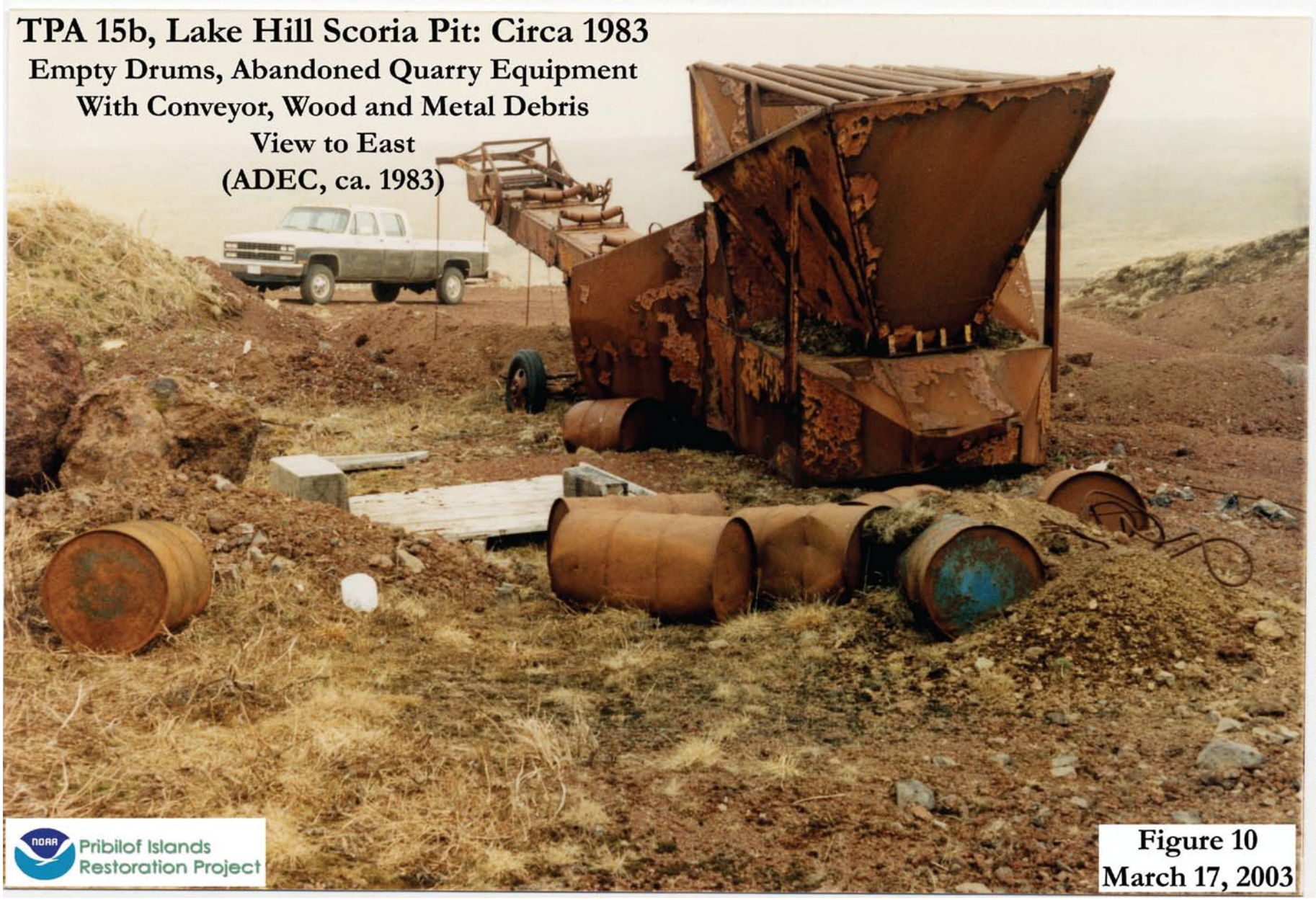


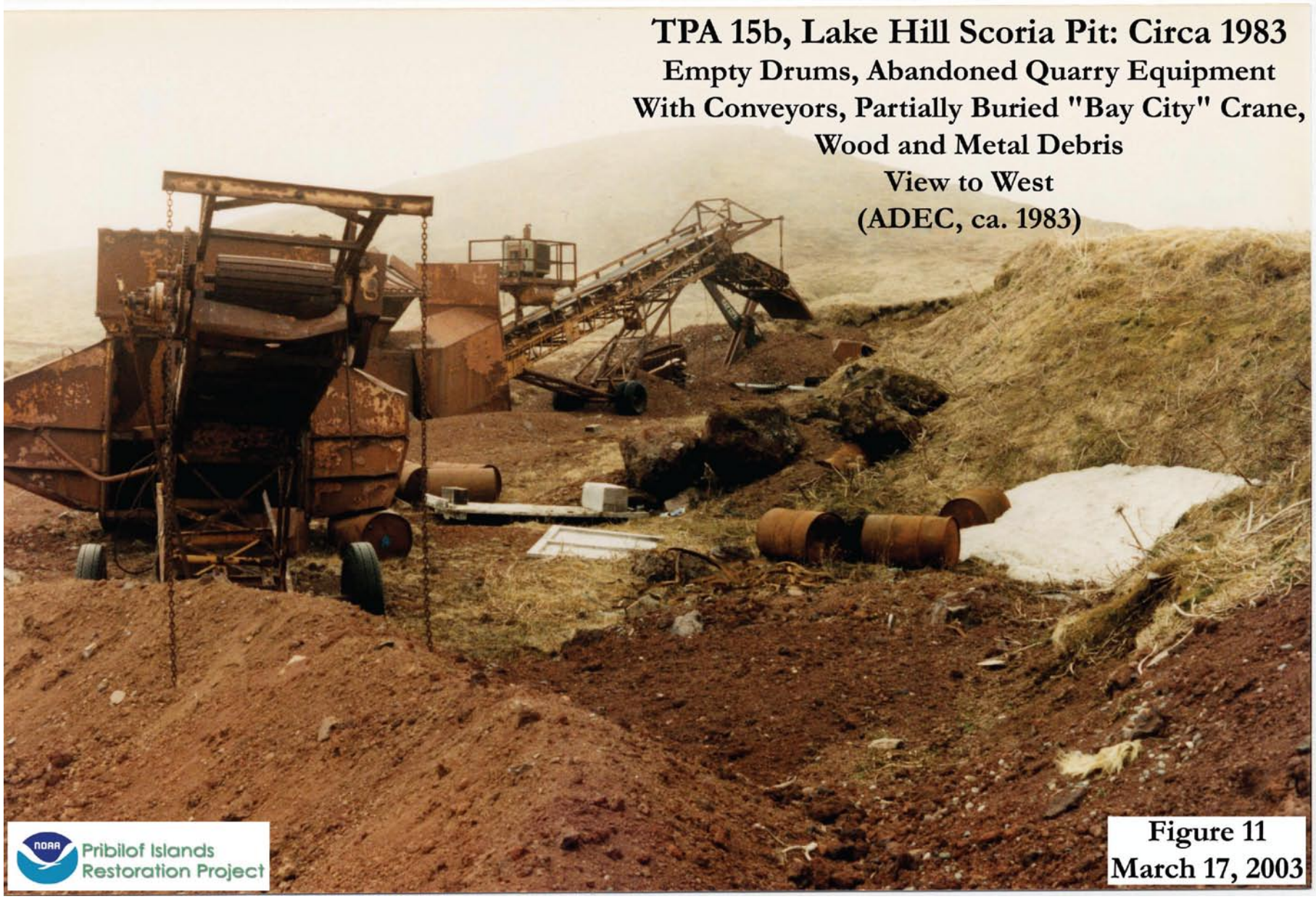
Pribilof Islands Restoration Project

Figure 7
March 17, 2003


TPA 15b, Lake Hill Scoria Pit: Circa 1983
Partially Buried "Bay City" Crane, Scoria Pit North End
(ADEC, ca. 1983)
BAY CITY
Pribilof Islands
Restoration Project
Figure 8
March 17, 2003


TPA 15b, Lake Hill Scoria Pit: Circa 1983
Empty Drums, Abandoned Quarry Equipment
With Conveyors, and "Bay City" Crane
View to East
(ADEC, ca. 1983)
NOAA
Pribilof Islands
Restoration Project
Figure 9
March 17, 2003


TPA 15b, Lake Hill Scoria Pit: Circa 1983
Empty Drums, Abandoned Quarry Equipment
With Conveyor, Wood and Metal Debris
View to East
(ADEC, ca. 1983)
NOAA
Pribilof Islands
Restoration Project
Figure 10
March 17, 2003

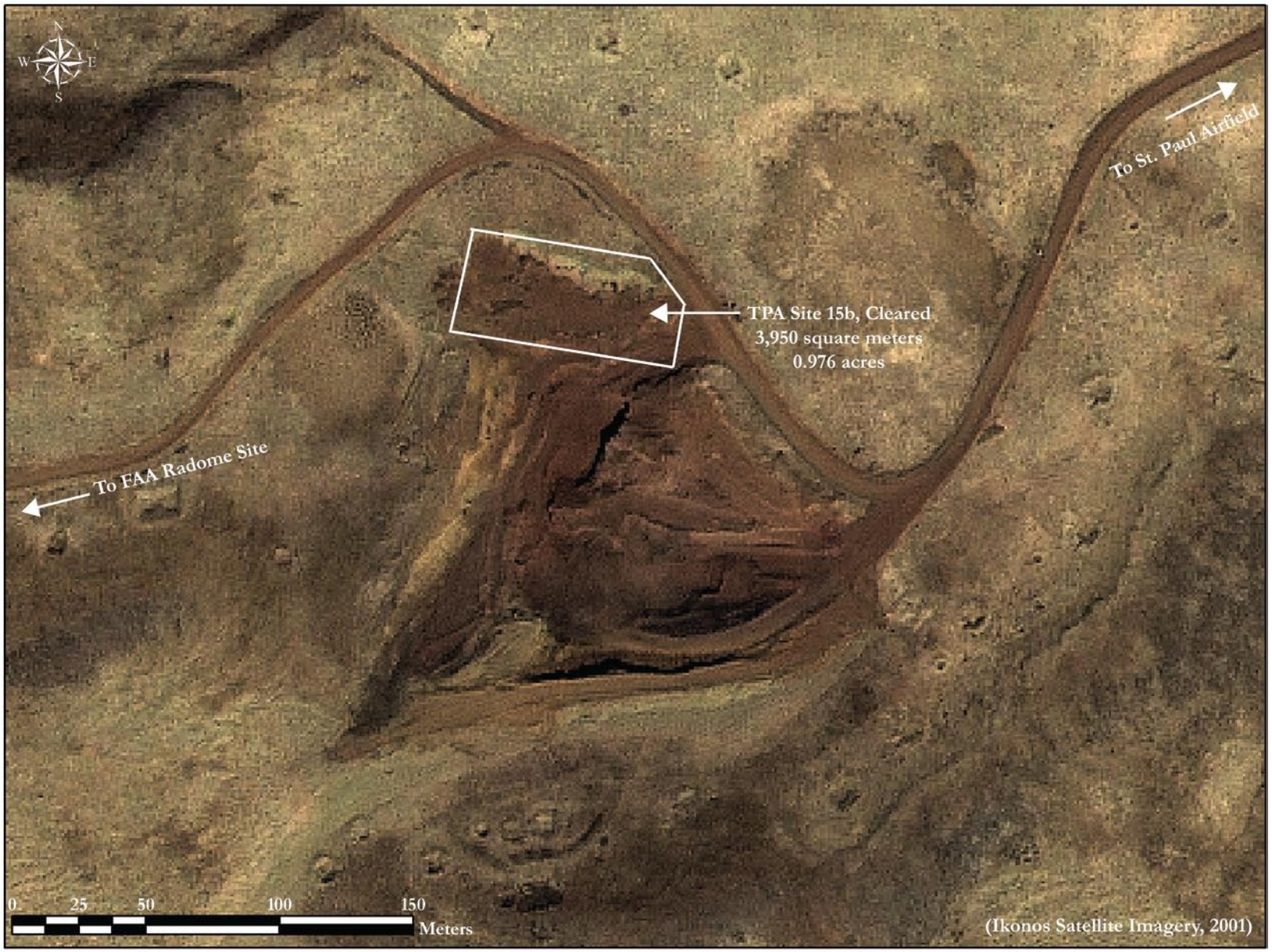

TPA 15b, Lake Hill Scoria Pit: Circa 1983
Empty Drums, Abandoned Quarry Equipment
With Conveyors, Partially Buried "Bay City" Crane,
Wood and Metal Debris
View to West
(ADEC, ca. 1983)
NOAA
Pribilof Islands
Restoration Project
Figure 11
March 17, 2003

Lake Hill Complex: 2001

Pribilof Islands Restoration Project

Figure 12
March 17, 2003

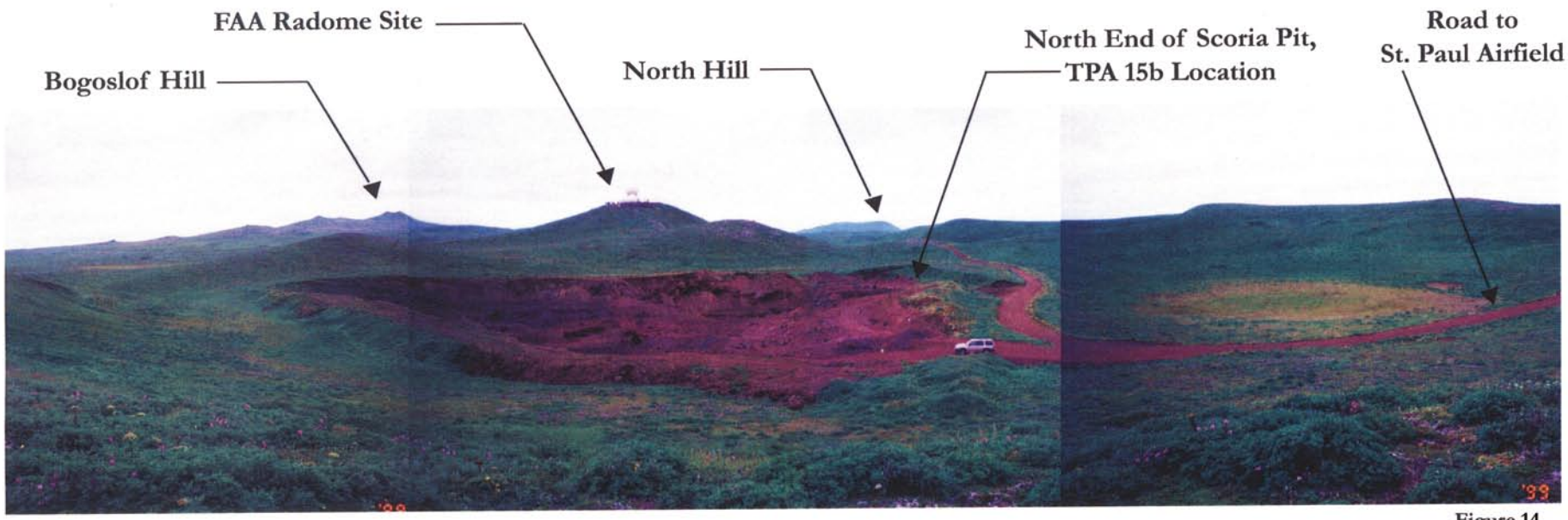
TPA 15b, Lake Hill Scoria Pit: 2001



Pribilof Islands Restoration Project

Figure 13
March 17, 2003

Lake Hill Scoria Pit: 1999



Pribilof Islands Restoration Project

Figure 14
March 17, 2003

TPA 15b, Lake Hill Scoria Pit, St. Paul Island.
Cleared Site. All Abandoned Equipment, Drums & Debris Removed.
Panoramic View from West-to-North (L - R)
(D. Winandy, NOAA PPO, 1999)

Lake Hill Scoria Pit: 1999

Figure 15
March 17, 2003

TPA 15b, Lake Hill Scoria Pit, St. Paul Island
Cleared Site. All Abandoned Equipment, Drums and Debris Removed.
Panoramic View from North-to-East (L - R)
(D. Winandy, NOAA PPO, 1999)

Lake Hill Scoria Pit: 1999

Pribilof Islands Restoration Project

Figure 16
March 17, 2003

TPA 15b, Lake Hill Scoria Pit, St. Paul Island
Cleared Site. All Abandoned Equipment, Drums & Debris Removed.
Panoramic View from Southeast-to-West, Southwest (L - R)
(D. Winandy, NOAA PPO, 1999)

C.2.a
(Y.38.016)

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269-7552
Fax: (907) 269-7649
http://www.state.ak.us/dec/

April 3, 2003

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-6349

RE: St. Paul Island Request for No Further Action Lake Hill Scoria Pit TPA Site No. 15b

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (the Department) received the above document on March 28, 2003. Based on a review of the information provided, the Department finds the Lake Hill Scoria Pit site listed in the Two Party Agreement (TPA) as Site No. 15b, does not pose a significant threat to human health or safety, or the environment. The Department concurs that TPA 15b does not require any further investigation or remedial action.

The Department is basing its decision on the most current and complete data provided by National Oceanic and Atmospheric Administration (NOAA). The Department reserves its rights, under 18 AAC 75 Oil and Other Hazardous Substances Pollution Control regulations, 18 AAC 60 Solid Waste regulations and AS 46.03 to require NOAA to perform additional investigation, cleanup, or containment if subsequent information indicates that: 1) additional contamination remains at the site which was previously undiscovered, does not protect human health, safety, or welfare, or the environment; or 2) the information it relied upon for its decision was invalid, incomplete, or fraudulent.

The Department requests NOAA attach a copy of this letter with the document. Please contact me with any questions or concerns at (907) 269-7552.

Sincerely,

Louis Howard

Louis Howard
Project Manager

1200-01-C.2.a-0578

2003 TPA 15b Lake Hill site.doc

NOAA St. Paul Island TPA 15b genl corr

Printed on Recycled

NOAA Site 39
TPA Site 15c: Scoria Pit – Ridge Wall
(Scoria Pits, TPA 15; TPA Attachment A)

St. Paul Island, Alaska Request for No Further Action Ridge Wall
Scoria Pit TPA Site No. 15c 947

Letter from Louis Howard to John Lindsay RE: St. Paul Island Request for
No Further Action Wall Scoria Pit TPA Site No. 15c. Dated April 3, 2003.....969

St. Paul Island, Alaska
Request for No Further Action
Ridge Wall Scoria Pit
TPA Site No. 15c

Site: Ridge Wall Scoria Pit, Two-Party Agreement (TPA) Site Number 15c, a Subsite of TPA Site No. 15, Scoria Pits. TPA Site No. 15 consists of Telegraph Hill, Lake Hill, and Ridge Wall Scoria Pits.

Location: St. Paul Island, Alaska, approximately 800 miles southwest of Anchorage in the Bering Sea. TPA Site No. 15c is located within Section 8, Township 35 South, Range 132, West of the Seward Meridian, Alaska (BLM 1986). It is within the western portion of St. Paul Island, approximately 120 meters (394 feet) north of the road to SW Point, 8,847 meters (5.5 miles) west of the airport, 7,197 meters (4.5 miles) northwest of the City of St. Paul, approximately 1,950 meters (1.21) miles to the nearest drinking water well at SW Point, 40 meters (131.2 feet) above mean sea level, and in the general vicinity of:

Latitude	57^0 9' 38.29"N	
Longitude	170^0 22' 38.51"W	(**Figure 1**)

Type of Release: Abandoned empty steel drums, metal and wood debris.

History:

In 1941, there was neither development at Ridge Wall, nor any roads to the site. The existing gravel road from the Village ended at the Zapadni Rookery Watch House, approximately 1,808 meters (1.12 miles) southeast of Ridge Wall. A trail extended from Antone Lake to the Watch House between Ridge Wall and Southwest Point to the west. (**Figure 2**).

In 1942, and in response to the invasion and occupation of Aleutian Islands by Japanese Imperial Forces, Pribilovians were evacuated to internment camps in southeast Alaska. U.S Army, U.S. Navy and U.S. Coast Guard units and personnel were deployed to the Pribilof Islands for defensive occupation of both St. George and St. Paul Islands.

By 1943, the U.S. Army had planned and constructed a series of facilities on the island (**Figure 3**), including the 1943 establishment of U.S. Coast Guard Unit #60 – Long Range Aid to Navigation (LORAN) "Double Master" Station at Southwest Point (USCG 1996). A drinking water well was installed for the LORAN Station at SW Point (**Figure 4**).

After WWII, the scoria pit continued to be used as a source of scoria aggregate or gravel. To what extent, it is currently unknown. In December 1976, the Department of Commerce began the process of conveying management and ownership of island properties under the Fur Seal Act of 1966 and the Alaska Native Settlement Claims Act. On January 19, 1979, the Bureau of Land Management ((BLM) awarded an interim conveyance and patented surface property rights to the Tanadgusix Corporation (TDX) and the subsurface property rights to The Aleut Corporation (BLM No. 149 1979). By July 14, 1986, BLM had completed final conveyance of the property (BLM 1986).

St. Paul Island, Alaska
Request for No Further Action
Ridge Wall Scoria Pit
TPA Site No. 15c

On October 28, 1983, the Federal Government withdrew from the management and administration of the Pribilof Islands.

In October 1983, the Alaska Department of Environmental Conservation (ADEC) conducted a field visit and literature research of the Community and Island of St. Paul. Carl H. Harmon, ADEC, did visit and inspect the Ridge Wall scoria pit. It is merely identified on Figure 1 of the report as "Old Seal Pit". The report did not describe any abandoned drums, equipment or debris at the site (ADEC 1984).

Circa 1983, NOAA presumes that a collection of photographs from ADEC files of the Ridge Wall scoria pit (ADEC, *Circa* 1983), were taken by Mr. Carl Harmon during his 1983 survey (ADEC 1984). The photographs depict sun bleached fur seal bones, steel 55-gallon drums, galvanized corrugated sheet metal panels, a household appliance, and miscellaneous wood and metal debris can be seen on the southeastern side of the pit, near the entrance from the road. The steel drums and galvanized corrugated steel sheeting show indications of extensive corrosion. Steel drums had deteriorated into visible fragments and components, and can be seen scattered at the site. (**Figure 5**). This accumulation was located at the area within the Ridge Wall scoria pit, which would first be designated as the U.S. Army Corps of Engineers (USACE) Department of Defense (DOD), Defense Environmental Restoration Account (DERA) Site No. D (USACE 1991), and later be designated as TPA Site No. 15c, Ridge Wall Scoria Pit (NOAA 1996).

In 1985, USACE initiated a debris cleanup and site restoration project on St. George and St. Paul Islands under the DERA program. This USACE-administered DERA program would later transition into the Department of Defense Formerly Used Defense Sites (DOD FUDS) program. On St. Paul Island, the contract identified 10 sites for the removal of miscellaneous wood and metal debris, and 55 gallon drum dumps, followed by appropriate site restoration and revegetation. The Alaska District, USACE contracted Chase Construction, Inc. (Chase) of Anchorage, Alaska, to complete this project under Contract No. DACA85-86-C-0003. On St. Paul Island, Chase subcontracted the Tanadgusix Corporation to perform the fieldwork. The Alaska District awarded the contract to Chase on November 06, 1985, with fieldwork being completed during 1986. The project work was accepted by the Alaska District on July 10, 1986, and given a satisfactory performance evaluation on August 26, 1987 (USACE 1991).

In the contract, the Ridge Wall Scoria Pit was designated by USACE as Site D, and originally described as:

> "<u>Site D</u>: Ridge Wall Borrow Pit: St. Paul Island
>
> The DOD debris at the Ridge Wall site is located along the south edge of the pit and covers an area about 150 ft. long and 50 ft. wide.
>
> The debris consists of the following:

- 100 thoroughly rusted barrels or partial barrels
- 500 barrel hoops
- 10 sheets of corrugated roofing
- 20 yd^3 of miscellaneous scrap metal and occasional pieces of wood

Labels on the barrels are rusted beyond recognition. Some barrels have fluid in them, likely rainwater has accumulated over the years through holes in the barrels." (USACE 1991).

Chase did identify the Ridge Wall site in its *Quality Control Program* written in 1985, in anticipation of its debris cleanup (Chase 1985). A review of Chase's "Daily Quality Control Inspection Report[s]" revealed that the site was inspected on the 12th, 13th and 15th of May 1986. The USACE representative, Mr. Robert Preston Rozier, arrived on-island on May 16, 1986, and inspected the site from which debris was hauled to disposal that day. Testing at sites was discussed during the general inspection tour made by Mr. Earl W. Benson, Chase Construction Quality Control Representative, Mr. Rozier, USACE Alaska District, and Mr. John Johnston, Pittsburg Testing Lab, on the 16th. The following general remark was recorded: 'Discussed testing (QC & PTL rep were told "No testing until COE rep present.")'. On the 17th of May, the site was again inspected. Additional debris was hauled from the site on May 21, 1986. On May 27, 1986, Chase performed "thorough inspections at all sites that have been worked on. Made out progress report based on these inspections." (Chase 1986).

As a subcontractor to Chase, and at completion of the field work on St. Paul Island, TDX submitted a letter to Chase on June 18, 1986, stating, "To the best of our knowledge all DOD materials existing on the Island of St. Paul have been disposed of as per contract drawings and specifications (TDX 1986). Consequently, on June 20, 1986, USACE and Chase tentatively set dates for project completion site, pre-final and finals inspections for the period 7/1 thru 7/3. The Alaska District, USACE, formally informed Chase that all work required under the contract had been completed, as of June 24, 1986, and accepted on September 9, 1987 (USACE 1987). However, there is no evidence for, or mention of any confirmation sampling conducted at the site by USACE through the DERA contractor.

In 1991, ADEC personnel conducted a site visit and preliminary assessment (PA) of nine sites on St. Paul Island, during the period July 30 – August 1. These sites were previously listed by DOD under DERA, as being suspected of past uncontrolled hazardous substance disposal. The Ridge Wall scoria pit site was described as:

"Site E – Ridge Wall Pit
This site was cleaned during the 1985 DERA cleanup. Prior to that, there was a pit approximately ½ acre in size containing metal debris. The site appeared to be clean. There was a large pile of seal bones at the site." (ADEC 1991 and ADEC 1992).

St. Paul Island, Alaska
Request for No Further Action
Ridge Wall Scoria Pit
TPA Site No. 15c

In October 1992, two Ecology And Environment, Inc (E&E) representatives and one U.S. Army Corps of Engineers, Alaska District representative conducted a site visit to St. George and St. Paul Islands. The Ridge Wall scoria pit, as well as the future TPA 15c site were visited, documented, and reported in a Preliminary Assessment (E&E 1993). The subsequent PA report states,

> "Residents claim that NOAA had left equipment at the Ridgewall Scoria Pit located adjacent to the road to Southwest Point. No equipment was present at the time of the site visit (E&E 1992)."

No photographs were included in the PA report. Within the PA, exposure pathways of concern are discussed for the three scoria pits, Lake Hill, Ridge Wall and Telegraph Hill Scoria Pits. However, the PA contained no discussion or indication of any contaminant releases or contaminated soil at the Ridge Wall scoria pit. Regardless, this PA provides the basis for the negotiated designation of TPA Site No. 15, Scoria Pits (E&E 1993).

Aerial photographs taken of St. Paul Island in 1993 (AeroMap US 1993), did not show any of the debris or drums visible in the ca. 1983 ground photographs (**Figure 6**).

On January 26, 1996, NOAA and the State of Alaska signed the Two Party Agreement (NOAA 1996). The Ridge Wall scoria pit site is included in the St. Paul Island TPA Site No. 15, Scoria Pits, designated as an Operating Unit 6 site for petroleum/hazardous substances contamination. However, the TPA provided no background, nor discussion of the Ridge Wall site. The TPA only stated, "All unburied drums on Lake and Ridgewall Hill were bulked, sampled, and disposed." As of 1996, only the 1985, U.S. Army Corps of Engineers (USACE) Defense Environmental Restoration Account (DERA), or formerly used defense site (FUDS) project removed drums, wood and metal debris from the Ridge Wall scoria pit. Based upon the *circa* 1983 photographs, USACE project documentation, ADEC PA and the E&E PA, all drums, metal and wood debris, and any equipment that might have been left at the site had been removed from the scoria pit site by the USACE DERA contractor. NOAA had not removed any drums from this site, when the TPA was signed. Within the TPA heading of "remaining activities", NOAA was to: "1. Remove machinery hulks/debris/empty drums and take confirmation samples. 2. NOAA to submit letter report with sample results for the site closure."

In 1996, NOAA awarded a cooperative agreement (CA), Award No. NA77AB0013, to a joint venture of Bering Sea Eccotech, Inc. (BSE) and Bristol Environmental Services Corporation (BESC), known as Aleutian Enterprises. BSE is a subsidiary of the TDX. TDX was the subcontractor to Chase Construction, which removed the debris from the Ridge Wall scoria pit, under contract to the U.S. Army Corps of Engineers (USACE), Alaska District, in 1986.

In early 1997, BSE conducted a site visit to TPA Site No. 15c, and found nothing to remove and no observable contamination. The Ridge Wall scoria pit was not included in the final CA work plan (Aleutian Enterprises 1997 and BSE 1998). Similarly, the project close-out report did not address the site, as no work had been conducted there (Aleutian Enterprises 1998). Because no

debris was removed, nor were there any apparent indications of contaminated soils at this site, no confirmation samples were taken (BSE 1998).

On August 22, 1999, David B. Winandy, NOAA Pribilof Project Office conducted a site visit, inspecting and photographing the site and the scoria pit. The TPA Site No. 15c had been cleaned (**Figures 7 thru 10**). There was no apparent contamination, via visual and olfactory observation. The larger scoria pit was an active quarry, although no quarrying activities were occurring on the day of the site visit.

In September 1999, NOAA tasked Tetra Tech EM Inc. (TTEMI) to provide independent verification. TTEMI conducted fieldwork at TPA Site No. 15c, under the approved closure confirmation sampling plan (TTEMI 2000). TTEMI reported, "This scoria pit is an active gravel quarry. Tetra Tech observed no visual evidence of buried or partially buried drums, stained soil, or potentially contaminated soil at the site. Seal, bird, and reindeer skeletons were present in the scoria pit. Miscellaneous debris also was observed, including tin cans and small quantities of paper and plastic waste that most likely was blown into the site. Tetra Tech did not observe any evidence of the debris that was removed by Chase in 1986 (U.S. Army 1991). No environmental samples were collected."

TTEMI recommended, "Based upon field observations conducted during the 1999 field effort, the three scoria pits are all active quarries. No visual evidence of the debris noted at the Lake Hill and Ridge Wall Scoria Pits during previous investigations was noted during the 1999 field effort. In addition, Tetra Tech observed no evidence of stressed vegetation, stained soil, or odors at either site. Because historical removal activities have occurred at these sites, and because the previous and current investigations have not identified any signs of releases from these two sites, Tetra Tech recommends no further action at the Ridge Wall and Lake Hill Scoria Pits."

In 2001, NOAA PPO procured IKONOS satellite imagery of St. Paul Island. In 2002, the digital elevation model (DEM) of the island was completed using this IKONOS imagery. In 2003, the IKONOS imagery was processed. In comparison between the 1993 and 2001 aerial imagery, additional excavation had occurred within the scoria pit (**Figure 11**). In 2001, the northwest rim of the scoria pit was at approximately 50 meters (164 feet) above mean sea level (MSL), the bottom of the pit was at approximately 40 meters (131.2 feet) above MSL, the water surface of the perched aquifer in the adjacent crater lake to the northwest was at approximately 90 meters (295.3 feet) and located approximately 912 meters (2,992 feet) distant, the scoria pit covered an area of 5,703 square meters (1.409 acres), and the depth to groundwater at the bottom of the scoria pit was estimated at 129 feet. (NOAA 2002).

St. Paul Island, Alaska
Request for No Further Action
Ridge Wall Scoria Pit
TPA Site No. 15c

Summary of Site Investigations:

ADEC obtained photographs of the site *circa* 1983, documenting seal bones, abandoned drums, corrugated sheet metal, and metal and wood debris at what was to become the TPA 15c site. USACE and Chase Construction documented abandoned drums, corrugated sheet metal, and metal and wood debris and location in the Ridge Wall scoria pit, St. Paul Island DERA Site D, which was later designated the TPA 15c site. E&E conducted a preliminary assessment of the site in 1992, six years after the DOD cleanup. E&E documented that equipment reportedly abandoned at the site was no longer there. The site had been cleaned up.

Summary of Clean up Actions:

In 1986, the USACE contractor, Chase Construction, Inc. and subcontractor, Tanadgusix Corporation, removed all drums and debris from the Ridge Wall scoria pit site, as part of the DERA project. No confirmation samples were taken at that time.

The 1996 TPA states "All unburied drums on Lake and Ridgewall Hill were bulked, sampled, and disposed." However, only the 1985, USACE DERA project removed drums, wood and metal debris from the Ridge Wall scoria pit. Based upon the *circa* 1983 photographs, USACE project documentation, ADEC PA and the E&E PA, all drums, metal and wood debris, and any equipment that might have been left at the site had been removed from the scoria pit site by the USACE DERA contractor. NOAA had not removed any drums from this site, when the TPA was signed

In 1997, BSE did not conduct any activities at the site under the NOAA CA for debris and UST removal, since the site was found to have already been cleaned under the DERA project. No confirmation samples were taken at that time, as there was no observable contaminated soil.

In 1999, NOAA PPO inspected and photographed the site. No visual or olfactory evidence of contaminate soil could be found. In 1999, TTEMI also observed no visual evidence of buried or partially buried drums, stained soil, or potentially contaminated soil at the site. As a result, no confirmation samples were taken.

In 2001, the site was an active quarry with extensive excavations both horizontally and vertically. No signs of past activities including debris, stained soils, stressed vegetation, or petroleum odors related to NOAA, DOD or their predecessor agencies are evident at this site.

Recommended Action:

Waiver the TPA requirement for confirmation sampling at the site, as there is no identifiable contaminated area to sample. In accordance with the waiver and paragraph 59 of the Two-Party Agreement (NOAA 1996), NOAA submits written confirmation that all corrective action has been completed and that no further action is required at TPA Site Number 15c, Ridge Wall Scoria Pit.

References:

ADEC. *Circa* 1983. *Photograhs of Abandoned Empty Steel Drums and Miscellaneous Debris, Ridge Wall Scoria Pit,* Circa *1983,* Pribilof Islands Collection, Alaska Department of Environmental Conservation, Anchorage, AK, Jennifer Donnell Solid Waste Management Division, 2002.

ADEC. 1984. *Field And Project Report, Waste Disposal, St. Paul Island, Conducted October 1 Through 8, 1983,* Carl H. Harmon, File No. 10-1-1983, March 21, 1984, State of Alaska, Department of Environmental Conservation, Southcentral Region, Anchorage.

ADEC. 1986. *Letter, Waste Disposal Permit Application Approval, Landfilling of Abandoned Debris on St. Paul Island, ADEC File No. 8521-BA019,* Alaska Department of Environmental Conservation, Southcentral Regional Office, Anchorage, Alaska, to Chase Construction, Inc. Anchorage, Alaska, 274-2533, June 5, 1986.

ADEC. 1991. *Preliminary Assessment Report For St. Paul Island, Pribilof Islands, Alaska,* December 1991, Alaska Department of Environmental Conservation, Juneau, Alaska.

ADEC. 1992. Letter to Corps Of Engineers (Attn: Richard Parrish) from Svend Brandt-Erichsen, ADEC Regional Administrator. January 24, 1992.

AeroMap US. 1993. *Aerial Photographs of St. Paul Island,* Summer 1993, AeroMap US, Anchorage, Alaska.

Aleutian Enterprises. 1997. *Final Workplan For Debris And Underground Storage Tank Removals, St. Paul Island, Pribilof Islands, Alaska, Volume I,* May 1997, NOAA Award No. NA77AB0013, BSE Project No. 7029FG-00, Aleutian Enterprises, Anchorage, for National Oceanic and Atmospheric Administration, Seattle.

Aleutian Enterprises. 1998. *Project Close-Out Report, NOAA Debris Cleanup, St. Paul Island, Alaska, 1997, November 1998, NOAA Award No. NA77AB0013, BSE Project No. 7029FG-00, Aleutian Enterprises, Bering Sea Eccotech / Bristol Environmental JV, Anchorage,* for National Oceanic and Atmospheric Administration, Seattle. (Note final report submitted by awardee to NOAA in November 1998, but bears the date of the draft submitted in February 1998.)

BLM No. 149. 1979. *Interim Conveyance No. 149, Dated January 19, 1979,* Sections 8 (fractional), all; 9 to 12 (inclusive), all; 16 (fractional), inclusive, excluding ANSCA Sec.3(e) determination AA-8452 [Zapadni Rookery]; and 17 (fractional), all. Book 18, Page 967, Aleutian Islands Recording District, AA-6697-A thru AA-6697-D, Bureau of Land Management, Anchorage, Alaska.

BLM. 1986. *Master Tile Plat (MTP), Surveyed Township 35 South, Range 132 West of the Seward Meridian, Alaska, Group No. 417 4/1/1986, Status of Public Domain, Land And Mineral Titles, Current to F&WS,* dated July 14 1986.

BSE. 1998. *St. Paul Island Cooperative Agreement (CA) Site Status,* August 17, 1998, Discussions between R. Dean Hughes, CA Island Project Manager, Bering Sea Eccotech, Inc., CDR Anthony L. Mercadante, PHS, and David B. Winandy, NOAA Pribilof Project Office, Western Administrative Support Center, Facilities & Logistics Division, during meeting to discuss and complete the proposed St. Paul Phase II PCS Remediation with Additional Debris Removal Grant/CA Proposal Development for submission to NOAA Grants Office, NOAA WASC.

Chase. 1985. *Quality Control Program For Contract DACA85-86-C-0003*; Debris Cleanup & Site Restoration Environmental Restoration Account, St. Paul Island, St. George Island, Alaska. November 1985.

Chase. 1986. Daily Quality Control Inspection Report[s], Project: Debris Cleanup & Site Restoration, St. Paul & St. George Island, Alaska, Contract # DACA85-86-C-003, Chase Inc., 2001 E. 3rd Avenue, Anchorage, Alaska 99501, Numbers 1-34.

E&E. 1993. *Final Report, Preliminary Assessment of National Oceanic And Atmospheric Administration Sites, Pribilof Islands, Alaska, Contract No. DACA85-91-D-0003, Delivery Order No. 0027,* February 1993, Ecology and Environment, Inc., Anchorage, for National Oceanic and Atmospheric Administration, Seattle, thru U.S. Army Corps of Engineers, Alaska District, Anchorage.

IKONOS. 2001. *IKONOS Satellite Imagery of St. Paul Island, Alaska,* NOAA Pribilof Project Office, Seattle, 2002.

MOU. 1976. *Memorandum of Understanding among Tanadgusix Corporation, St. Paul Island, Alaska, and Tanaq Corporation, St. George Island, Alaska, and United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, regarding Pribilof Islands Land Selections,* December 22, 1976.

NOAA. 1996. *Pribilof Islands Environmental Restoration Two Party Agreement.* Attorney General's Office File No. 66 1-95-0126, National Oceanic and Atmospheric Administration. January 26, 1996.

NOAA. 1999. *Site Visit Photographs, TPA Site No. 15b, Lake Hill Scoria Pit, David B. Winandy, August 23, 1999,* NOAA Pribilof Project Office, Seattle.

NOAA. 2002. *Digital Elevation Model (DEM), St. Paul Island, Alaska,* NOAA Pribilof Project Office (NOAA PPO), Seattle, 2002.

TDX. 1986. *Letter, Subject: Questionable Material Which Will Not Be Removed From St. Paul Island Per Contract DACA85-86-C-0003,* June 18, 1986, Gregory Fratis, Sr., and Anthony Philemonoff, TDX Corporation, to Chase Construction, Inc.

TTEMI. 2000. *Final, Closure Confirmation Report, Telegraph Hill, Ridge Wall, And Lake Hill Scoria Pits, Two-Party Agreement Site No. 15, Pribilof Islands Site Restoration, St. Paul Island, Alaska*, December 18, 2000, Contract No. 50WCNA906018, Modification No. 56WCNA901077, Tetra Tech EM Inc., Seattle, for National Oceanic and Atmospheric Administration, Kansas City.

USF&WS. 1941. *Map, St. Paul Island, Alaska, Scale 1/40,000, Drawn by J.R. Stacy, 1941*, U.S. Department of the Interior, U.S. Fish & Wildlife Service.

U.S. Army Engineer. 1943. *Map, Project Location And General Layout, Airfield And Garrison Site, Sheet No. 1, St. Paul Island, Alaska, Scale 1:20,000, Feb 9, 1943,* U.S. Engineer Office, Anchorage, Alaska, War Department.

USACE. 1987. *Letter, Subject: Completion and Acceptance of Work, Contract DACA85-86-C-0003, Debris Cleanup and Site Restoration, St. Paul and St. George Islands,* September 9, 1987, Serial No. RR0-35, Contracting Officer, U.S. Army Corps of Engineers, Alaska District, Contract Administration Branch, Anchorage, to Chase Construction, Inc., Anchorage.

USACE. 1991. *Letter with attachments, Subject: Contract DACA85-86-C-0003, Debris Cleanup and Site Restoration, St. Paul and St. George Islands,* June 28, 1991, U.S. Army Corps of Engineers, Alaska District, Construction Operations Division, Anchorage.

USCG. 1946. *Topography Map, St. Paul LORAN Station, Drawing No. 528, Sheet 1 of 2, Southwest Point, St. Paul Island, February 19, 1946,* United States Coast Guard, Engineering, 17 N.D., D.C.G.O., Ketchikan, Alaska.

USCG. 1996. *Letter, Subject: U.S. Coast Guard Research of Past Activities on the Pribilof Islands, Alaska,* 16478, December 13, 1996, U.S. Coast Guard Civil Engineering Unit, Juneau, Alaska, to National Archives and Records Administration, Cottage Park, Maryland.

USCG. 2003. *Webpage, Welcome to Long Range Navigation Station, St. Paul Island, AK,* March 18, 2003, www.uscg.mil/d17/loransp/home.htm , U.S. Coast Guard 17th District.

St. Paul Island, Alaska
Request for No Further Action
Ridge Wall Scoria Pit
TPA Site No. 15c

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

3/25/03
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at TPA Site Number 15c, Ridge Wall Scoria Pit, in accordance with the Agreement and that no further action is required.

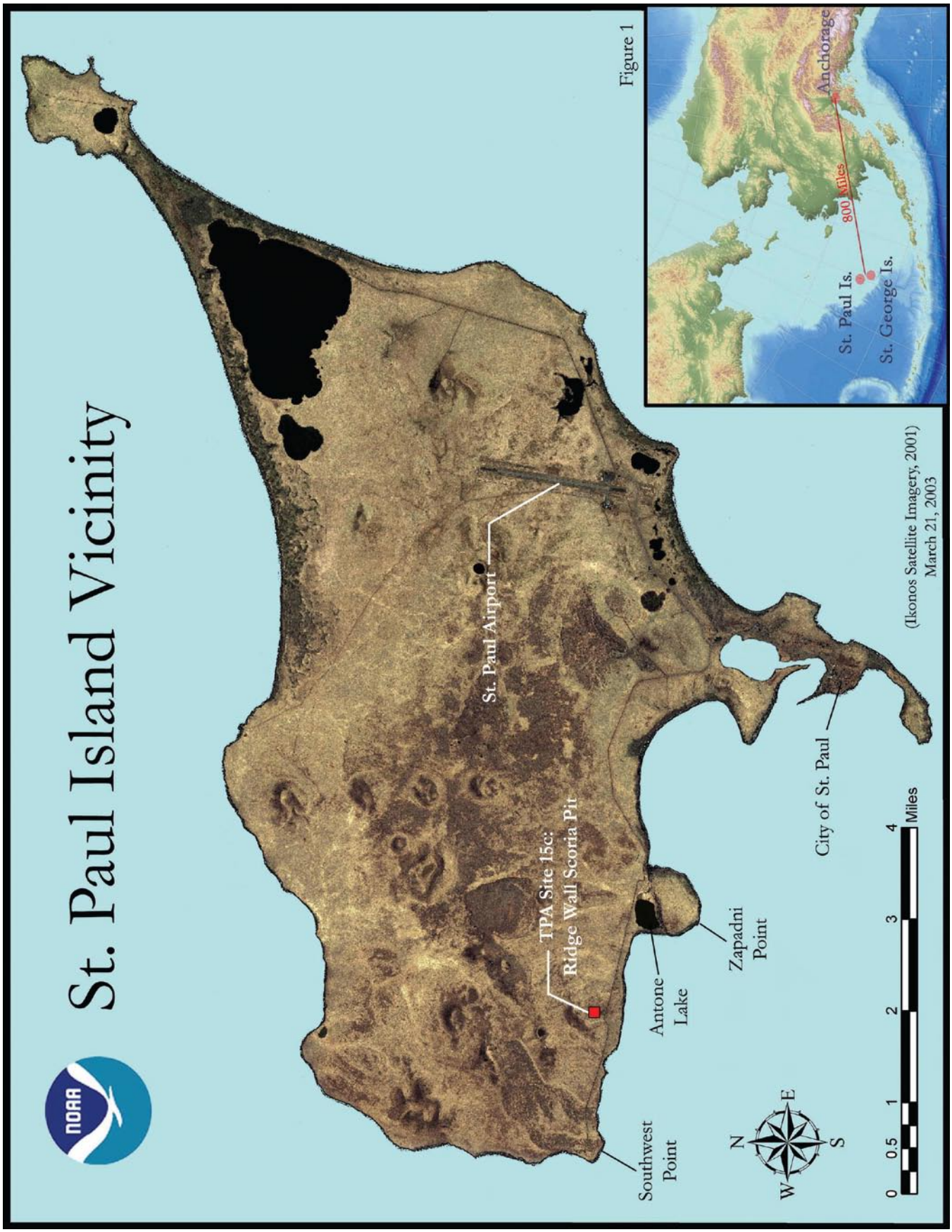
See Attached letter

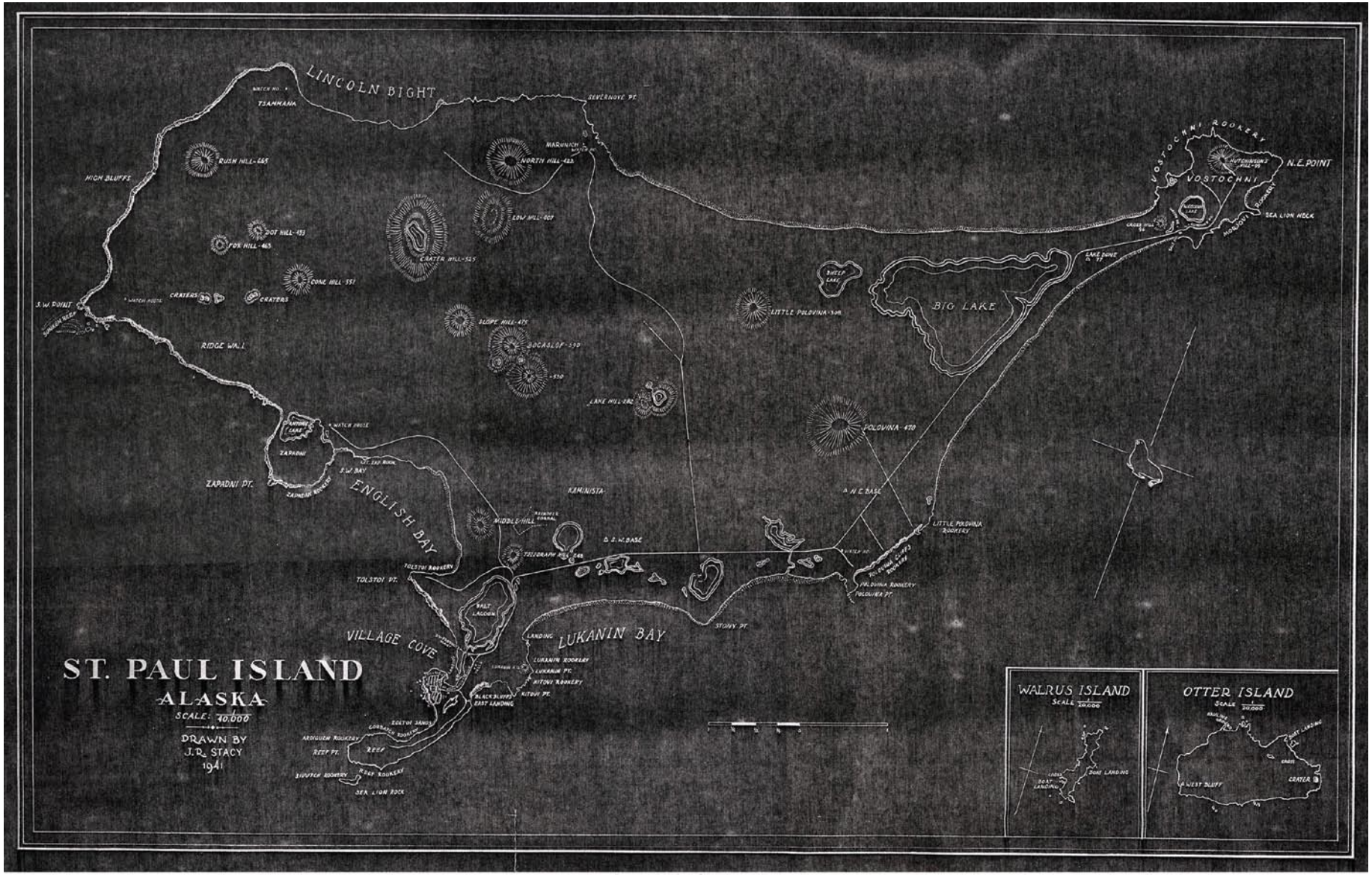
For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

April 3, 2003
Date

Basic: March 20, 2003

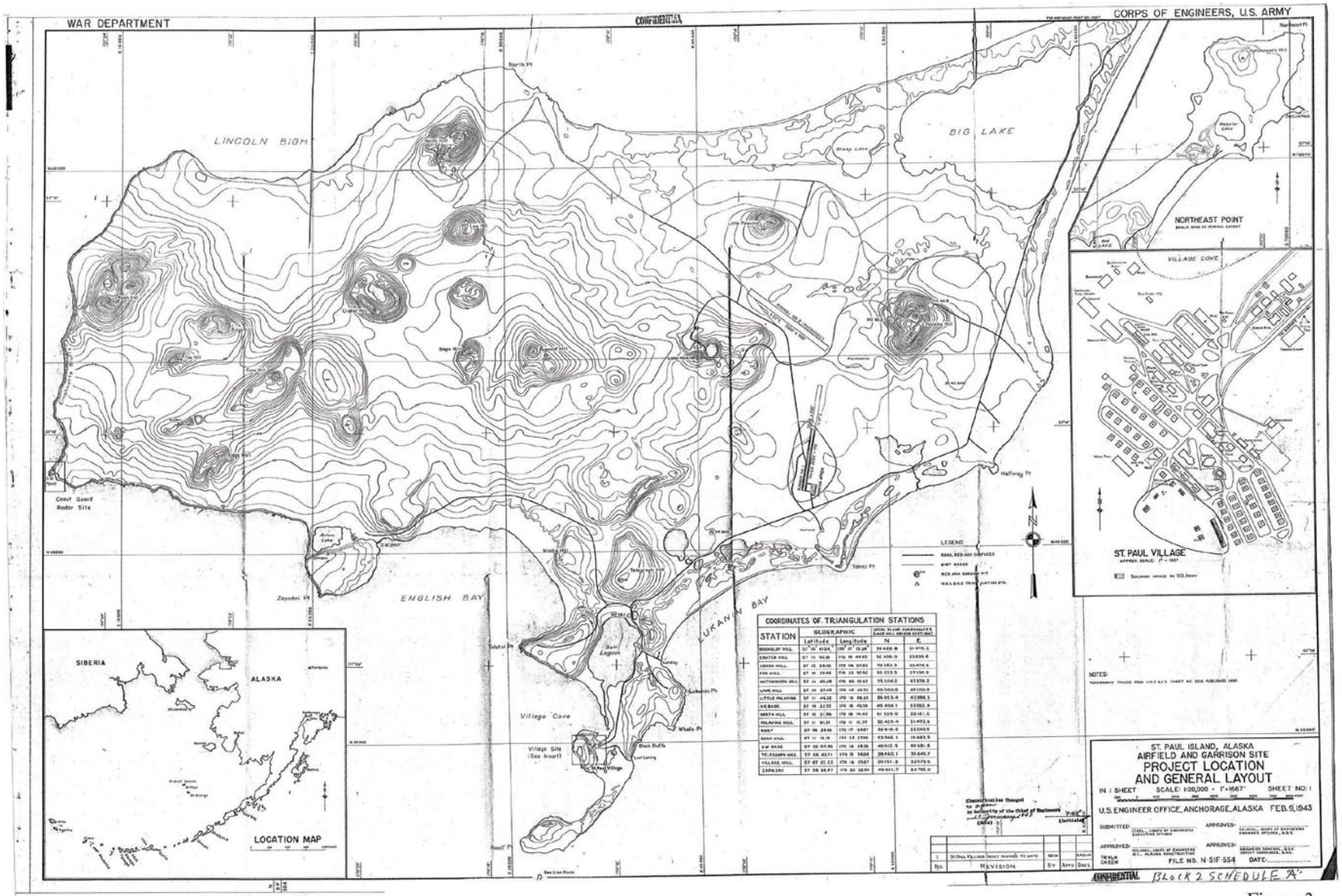

St. Paul Island Vicinity
Figure 1
Anchorage
800 Miles
St. Paul Is.
St. George Is.
St. Paul Airport
TPA Site 15c:
Ridge Wall Scoria Pit
Antone
Lake
Zapadni
Point
City of St. Paul
Southwest
Point
(Ikonos Satellite Imagery, 2001)
March 21, 2003
N
E
S
W
0
0.5
1
2
3
4
Miles



Pribilof Islands Restoration Project

St. Paul Island Map
1941 (Pre-World War II)
U.S. Department of the Interior
U.S. Fish and Wildlife Service
Note: No road to the Ridge Wall or Southwest Point.
Foot trail to Southwest Point and north to Tsamhana did exist.

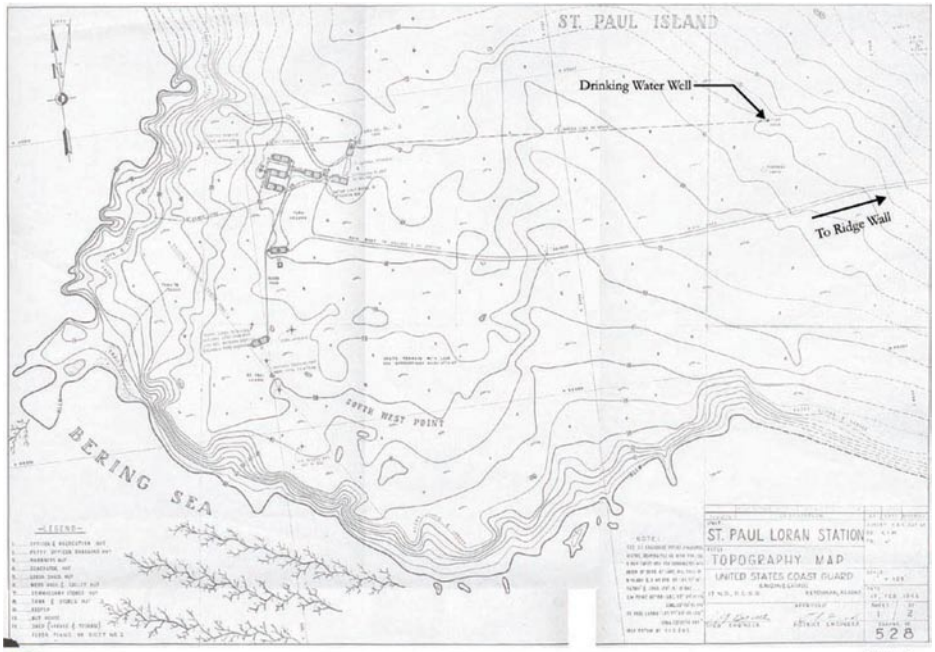
Figure 2
March 21, 2003



Pribilof Islands Restoration Project

St. Paul Island Map
February 9, 1943
U.S. Army Engineer Office, Anchorage, Alaska
Note: Road around western island perimeter is not shown, but the USCG Station at Southwest Point is.

Figure 3
March 21, 2003



Pribilof Islands Restoration Project

Topography Map, Southwest Point, St. Paul Island, Alaska
February 19, 1946
U.S. Coast Guard Engineering, Ketchikan, Alaska
Note: Shown are the semi-permanent facilities which replaced the WWII USCG expeditionary station.

Figure 4
March 21, 2003

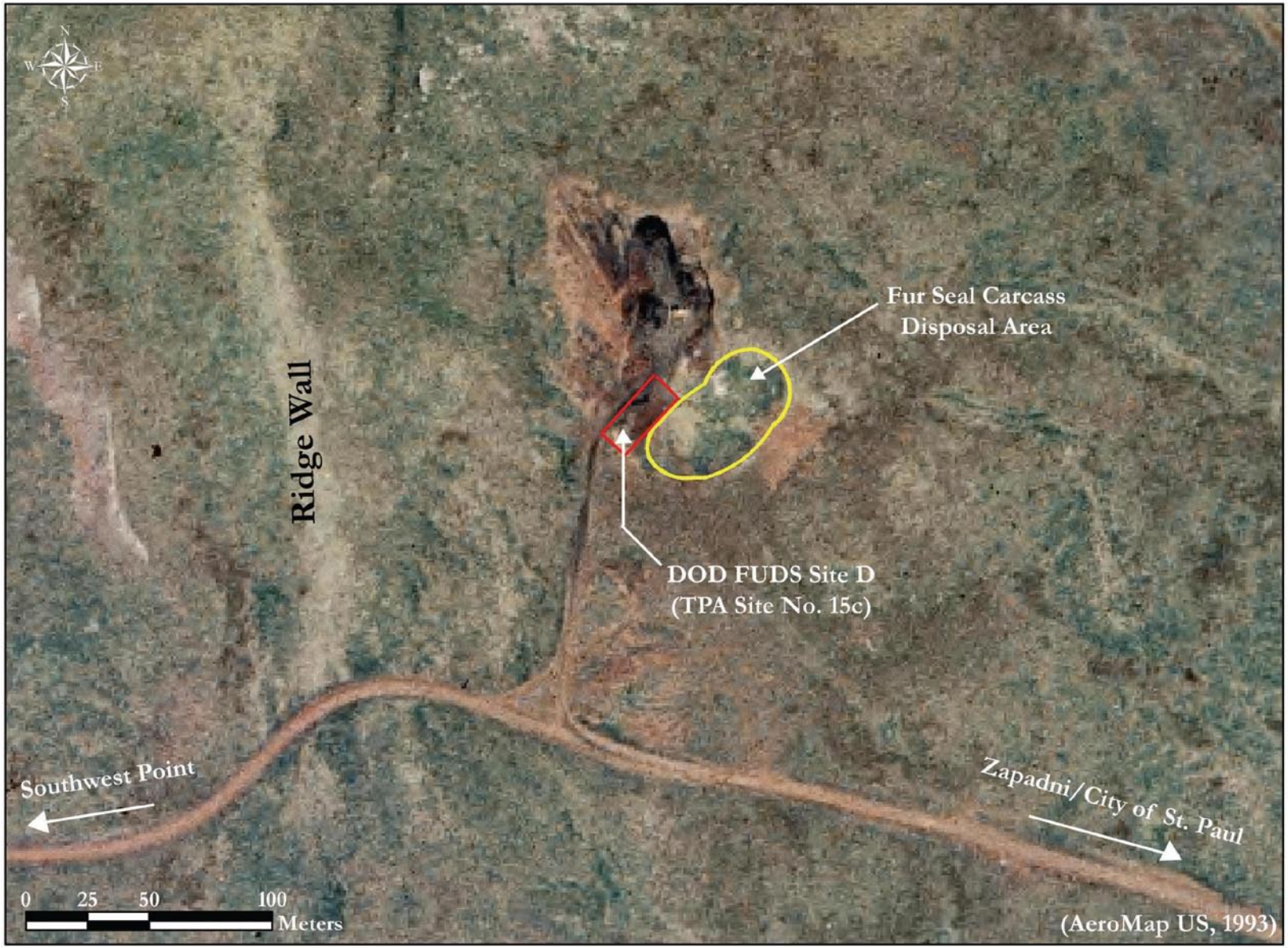
DOD FUDS Site D/TPA Site 15c
Ridge Wall Scoria Pit: Circa 1983

Pribilof Islands Restoration Project

Figure 5
March 21, 2003

Seal Bones, Abandoned Drums, Sheet Metal, Miscellaneous Wood & Metal Debris
Panoramic View From Southeast-to-South (L-R)
(ADEC, ca. 1983)

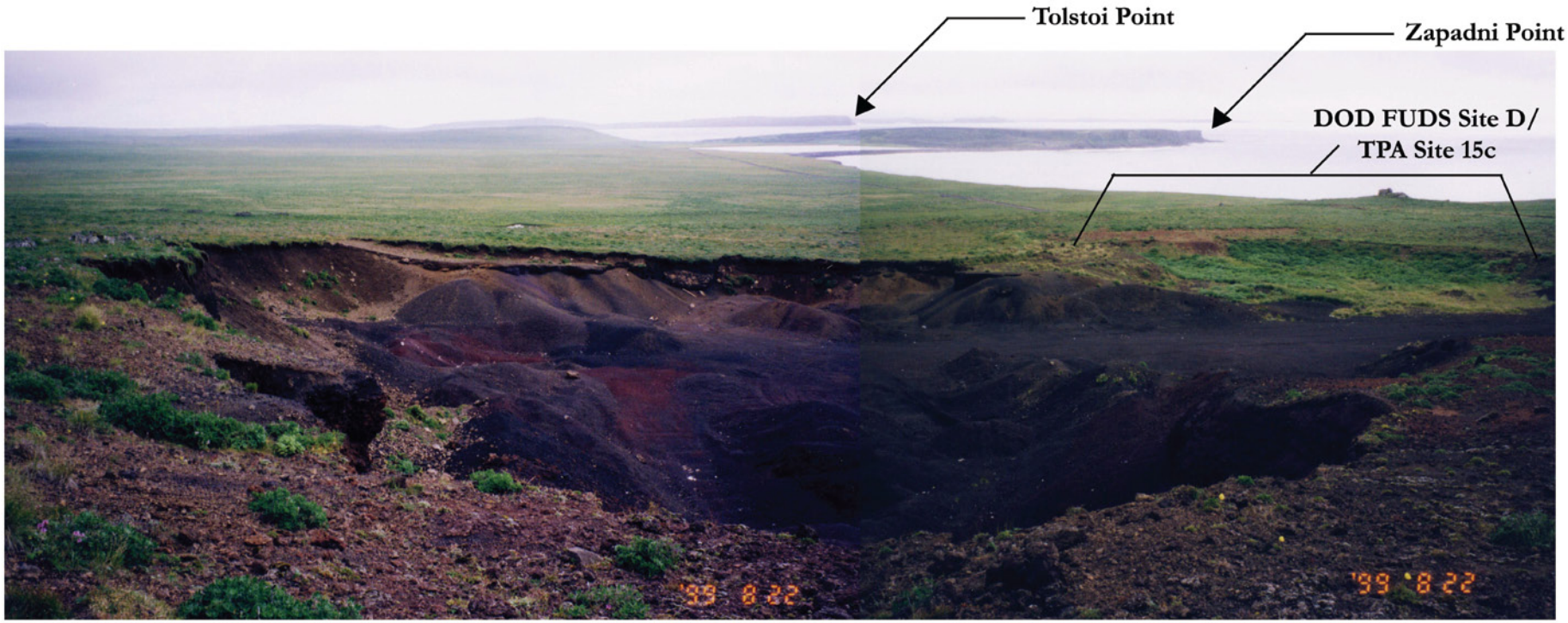
Ridge Wall Scoria Pit: 1993



Pribilof Islands Restoration Project

Figure 6
March 21, 2003

Ridge Wall Scoria Pit: 1999

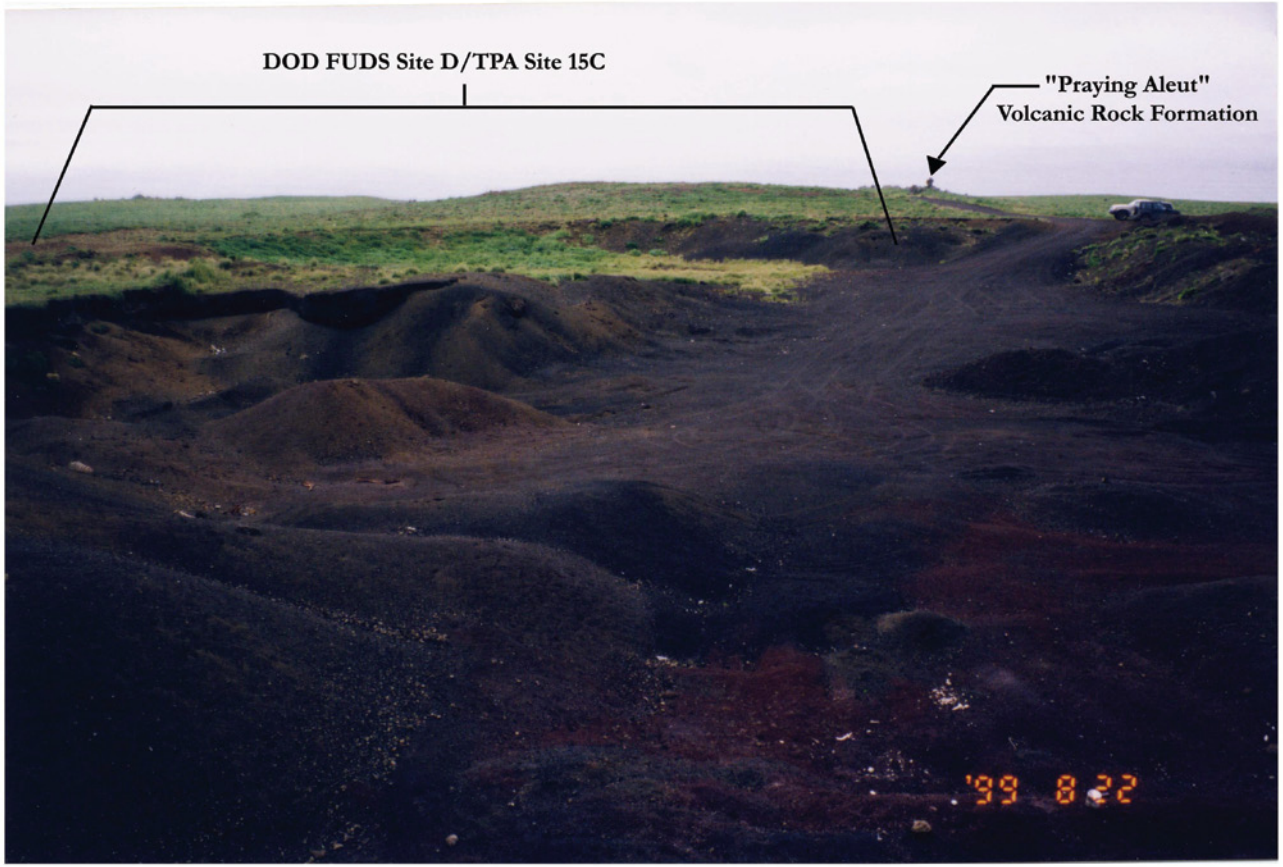


Pribilof Islands Restoration Project

Figure 7
March 21, 2003

TPA Site 15c, Ridge Wall Scoria Pit, St. Paul Island
East side of Scoria Quarry. All abandoned drums, sheet metal, wood & metal debris shown in ca. 1983 photographs removed. Entranced to quarry to the right. Additional excavation evident. Panoramic view from east-to-southeast (L-R).
(D. Winandy, NOAA PPO, 1999)

Ridge Wall Scoria Pit: 1999



Pribilof Islands Restoration Project

Figure 8
March 21, 2003

DOD FUDS Site D/TPA Site 15c, Ridge Wall Scoria Pit, St. Paul Island.
Scoria Quarry entrance view to south.
Cleared Site. All abandoned drums,
sheet metal, wood & metal debris shown in
ca. 1983 photographs have been removed.
(D. Winandy, NOAA PPO, 1999)

Ridge Wall Scoria Pit: 1999

Pribilof Islands Restoration Project

Figure 9
March 21, 2003

DOD FUDS Site D/TPA Site 15c, Ridge Wall Scoria Pit, St. Paul Island
View to west - west side of Scoria Quarry active in 1999. Cleared site.
Entrance to quarry on left. "Ridge Wall" volcanic landform in immediate background.
(D. Winandy, NOAA PPO, 1999)

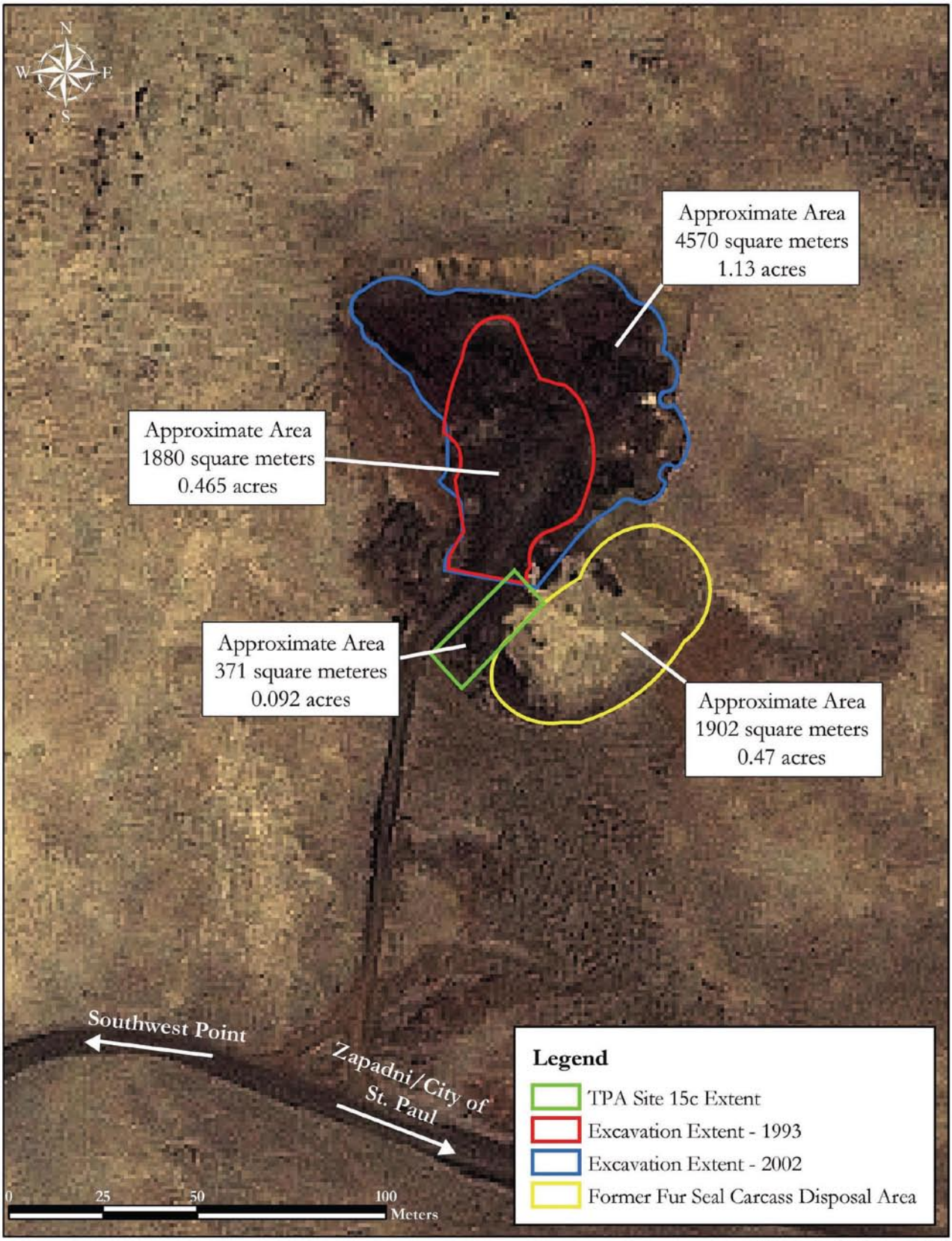
Ridge Wall Scoria Pit: 1999

Pribilof Islands Restoration Project

DOD FUDS Site D/TPA 15c, Ridge Wall Scoria Pit, St. Paul Island
Cleared site. View from road entrance on south side of Quarry.
Panoramic view with "Ridge Wall" on the left (west) to Zapadni &
Antone Lake on the right (east-southeast). Debris shown in ca. 1983 photographs,
and described in USACE documents, removed in 1986.
(D. Winandy, NOAA PPO, 1999)

Figure 10
March 23, 2003

TPA Site 15c: Ridge Wall Scoria Pit



(Ikonos Satellite Imagery, 2001)

Pribilof Islands Restoration Project

Figure 11
March 21, 2003

C.2.a ADEC
(cc P.39 016)

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269-7552
Fax: (907) 269-7649
http://www.state.ak.us/dec/

April 3, 2003

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-6349

RE: St. Paul Island Request for No Further Action Ridge Wall Scoria Pit TPA Site No. 15c

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (the Department) received the above document on March 28, 2003. Based on a review of the information provided, the Department finds the Ridge Wall Scoria Pit Site listed in the Two Party Agreement (TPA) as Site No. 15c, does not pose a significant threat to human health or safety, or the environment. The Department concurs that TPA 15c does not require any further investigation or remedial action.

The Department is basing its decision on the most current and complete data provided by National Oceanic and Atmospheric Administration (NOAA). The Department reserves its rights, under 18 AAC 75 Oil and Other Hazardous Substances Pollution Control regulations, 18 AAC 60 Solid Waste regulations and AS 46.03 to require NOAA to perform additional investigation, cleanup, or containment if subsequent information indicates that: 1) additional contamination remains at the site which was previously undiscovered, does not protect human health, safety, or welfare, or the environment; or 2) the information it relied upon for its decision was invalid, incomplete, or fraudulent.

The Department requests NOAA attach a copy of this letter with the document. Please contact me with any questions or concerns at (907) 269-7552.

Sincerely,

Louis Howard

Louis Howard
Project Manager

1200-01-C.2.a-0579

2003 TPA 15c Ridge Wall site.doc

NOAA St. Paul Island TPA 15c genl corr

PDF3097

Printed on Recycled

NOAA Site 40
NTPA: Aleut Bunkhouse

Site Closure Report – Draft - Former Aleut Bunkhouse (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska.....973

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report Former Aleut Bunkhouse (Non Two Party Agreement Site) Pribilof Islands Site Restoration Project, St. Paul Island, AK February 1, 2001. Dated March 2, 2001.....985

SITE CLOSURE REPORT - FINAL

Former Aleut Bunkhouse
(Non Two-Party Agreement Site)

Pribilof Islands Site Restoration
St. Paul Island, Alaska

June 6, 2001

Prepared For:
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office

Prepared By:

ENVIRONMENTAL & ENGINEERING CONSULTANTS
Fairbanks, Alaska

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY 975
2.0 INTRODUCTION 975
2.1 Objectives 975
2.2 Methodology and Applicable Regulations 976
3.0 SITE BACKGROUND 976
3.1 Island Historical Information 976
3.2 Island Environmental Setting 976
3.2.1 Climate 977
3.2.2 Geology and Soil 977
3.2.3 Surface Water and Groundwater 977
3.3 Site Description 977
3.3.1 Geology and Soil 977
3.3.2 Surface Water and Groundwater 977
3.4 Previous Investigations And Other Activities 978
4.0 FIELDWORK ACTIVITIES 978
4.1 Debris Removal 978
4.2 Soil and Groundwater Sampling 978
5.0 DEBRIS AND SUSPECT SOILS DISPOSAL 978
5.1 Debris Disposal and Recycling 978
5.2 Soil Disposal and Remediation Treatment 979
6.0 DISCUSSION 979
7.0 CONCLUSIONS AND RECOMMENDATIONS 979

APPENDICES

Appendix 1: Figures & GPS Information
Appendix 2: Site Photographs
Appendix 3: Daily Reports (and Scrap Recycle Receipt)
Appendix 4: Laboratory Analytical Reports – not prepared for this debris site
Appendix 5: Site Video Documentation

1.0 EXECUTIVE SUMMARY

The Former Aleut Bunkhouse, which is a non-Two Party Agreement (non-TPA) Site, has been cleaned up and only a scoria-backfilled concrete wall foundation remains, which is located about 1 mile from the northeastern tip of the island, and only a few hundred yards from the Bering Sea shoreline to both the south and north. (Figure 1, Appendix 1).

NORTECH Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to the Former Aleut Bunkhouse site and administered a program of solid waste and debris removal, followed by scoria backfill, from June 19 to June 20, 2000. Several truckloads of solid wastes – mostly wooden building debris - were extracted from the Bunkhouse's foundation, loaded, and hauled away for disposal. The wooden wastes were burned, and the very limited quantity of metal debris removed was taken to the NMFS staging area for September 2000 transport by barge to Seattle, for recycling off-island. A concrete and firebrick chimney was loaded, transported and disposed of at the St. Paul Landfill. Based on review and analysis of available project photographs and Daily Reports, ***NORTECH*** arrived at the following environmental conclusions:

- No soils at the site of the Former Aleut Bunkhouse are suspected of being contaminated at a level greater than the applicable ADEC soil cleanup standards.
- Groundwater contamination is considered to be very unlikely at this debris removal site, given the lack of any evidence of the presence of any spills, leaks, or other petroleum hydrocarbon releases at this site.

Based on these conclusions, ***NORTECH*** recommends the following:

- No Further Action is necessary at this debris removal site.

2.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration, is responsible for environmental restoration activities on St. Paul and St. George Islands, Alaska. Collectively, these islands are part of a five island archipelago known as the Pribilof Islands. Under Public Law 104-91, NOAA is responsible for the cleanup of debris, landfills, wastes, storage tanks, hazardous and unsafe conditions, as well as contaminants including petroleum products and their derivatives left by NOAA on lands transferred or obligated for transfer on the Pribilof Islands. Affected properties are described in a two party agreement (TPA) between NOAA and the Alaska Department of Environmental Conservation (ADEC) dated January 26, 1996 (NOAA 1996). Under State of Alaska environmental regulations and in accordance with the TPA, NOAA has undertaken an array of site characterization and restoration activities on St. Paul and St. George Islands. Additional work must be conducted to satisfy the TPA, including limited site characterization, remediation, confirmation sampling, and site restoration (NOAA 1996).

Under Contract No. 52ABNA500049, Task Order 56ABNA703706, ***NORTECH*** Environmental and Engineering Consultants (***NORTECH***) has prepared this Site Closure Report for the Former Aleut Bunkhouse, to report on the debris removal and environmental assessment activities which occurred during the 2000 fieldwork season.

2.1 Objectives

The overall objective for the St. Paul Debris Removal project undertaken by ***NORTECH*** was to develop a written plan of action, have it approved by NOAA and ADEC, and execute it for each TPA and non-TPA site. At each removal area ***NORTECH*** was to accomplish the acts necessary to gain a no-further-action designation from ADEC, or else gain an understanding of the corrective action efforts that could eventually lead to proper site closure.

2.2 Methodology and Applicable Regulations

In order to meet the project objective, ***NORTECH*** developed a draft Corrective Action Plan and an array of Sampling & Analysis Plans (SAPs) in March 2000 for eleven designated St. Paul debris sites. They were reviewed and approved by NOAA and ADEC, fieldwork was begun in mid-April, and essentially completed in late November 2000. The fieldwork was performed in accordance with the Corrective Action Plan, the site's SAP, and the 1996 Two Party Agreement (TPA) between ADEC and NOAA including the following 1991 versions of ADEC's regulations and associated guidance documents, as referenced in the TPA, particularly sections 21 to 28, 59, and 103 which call for the application of:

- 18 Alaska Administrative Code (AAC) 70 Water Quality Standards
- 18 AAC 75 Oil and Hazardous Substances Pollution Control
- Underground Storage Tank Procedures Manual, Guidance for Treatment of Petroleum Contaminated Soil and Water and Standard Sampling Procedures

3.0 SITE BACKGROUND

This section provides a brief discussion of the location and history of the Pribilof Islands, weather and environmental conditions on St. Paul Island, a site description, and a summary of previous investigations ***NORTECH*** was aware of at this specific St. Paul debris removal site.

3.1 Island Historical Information

Russia first discovered St. Paul Island and its seal rookeries in 1786. In the 1820s, Russia established a settlement on St. Paul Island to support fur seal harvesting. The United States acquired the Pribilof Islands in 1867, when Alaska was purchased from Russia. In 1869, the United States made the Pribilof Islands a federal reservation. From 1869 to 1909, the United States contracted fur seal harvesting and pelt processing to private companies. From 1910 to 1979, the federal government was the sole operator and administrator of the Pribilof Islands. In 1971, the Alaska Native Claims Settlement Act passed, which provided for the transfer of property and management of the islands to Alaskan Native regional and village corporations.

The only major landowners on St. Paul Island are the Tanadgusix Corporation (TDX) and the federal government. Minor landowners include the City of St. Paul, the St. Paul Tribal Council, and the State of Alaska. The federal government currently retains title to about 1,515 acres on St. Paul Island, which consisted of seal rookeries and administrative offices managed by the National Marine Fisheries Service, bird rookeries managed by the U.S. Fish & Wildlife Service, a U.S. Coast Guard (USCG) LORAN station, two scoria pits, the current landfill, and a National Weather Service station. The island's airport, which consists of about 67 acres of land, was conveyed to the State of Alaska in 1989.

3.2 Island Environmental Setting

St. Paul Island is located between latitude 57° 06' and 57° 15' North and longitude 170° 05' and 170° 25' West. It is surrounded by the Bering Sea, and is about 800 miles west southwest of Anchorage and 300 miles north northwest of Dutch Harbor, Alaska. The island is about 44 square miles in area (Figure 1). About 27 centerline miles of road bisect the island north south and east west. The City of St. Paul is located on the southern peninsula of the island; its 1998 population included 761 people (ADL 1999). St. Paul Island has many sand dunes and is vegetated with grasses and small forbes over the majority of its area. The vegetation is broadly classified as moist tundra. Some common plant species present on the island include blue lupine, arctic poppy, beach wild rye, and sea beach sandwort.

St. Paul Island serves as a nesting area for a great number of seabirds and a rookery area for northern fur seals. Commercial crab harvesting areas are located within 15 miles of the island. Major harvest species are the Tanner crab and Korean Hair crab.

3.2.1 Climate

The climate of the island is classified as subpolar. Maritime weather conditions prevail on the island, with predominantly cloudy, foggy, and windy conditions. Total annual precipitation averages 23.3 inches, with most occurring between the months of April and October. The mean monthly temperature ranges from 22.4°F in winter to 47.8°F in summer, with a mean annual temperature of 34.8°F. Wind speeds range from nil to over 100 miles per hour, with an average of 17.2 miles per hour (NCDC 1999).

3.2.2 Geology and Soil

St. Paul Island is composed of basaltic lava flows and sills overlain by a thin veneer of tuffaceous and scoriaceous material, glacial sediment, and sandy material that has formed dunes on the eastern portion of the island. A number of cinder cones rise to a maximum elevation of 665 feet. The cones are moderately steep sided, with several having craters at their summits. A gently rolling topography, averaging 200 feet in elevation, occurs between the cones.

The shoreline along the Bering Sea ranges from rocky sea cliffs and headlands to short, steep beaches and is generally composed of cobbles, gravel, and sand. The shoreline of the western portion of the island is generally rocky sea cliffs and headlands, with beach shoreline and back dunes present in other portions.

3.2.3 Surface Water and Groundwater

Many lakes are located on St. Paul Island, but no streams are known to exist. The largest lake, Big Lake, is located on the northeastern part of the island. Sheep Lake is located west of Big Lake. Other smaller lakes are located in the southern portion of the island. The lakes with direct estuarine connection to the Bering Sea (for example, the Salt Lagoon) tend to be brackish; the remaining lakes are freshwater. Much of the surface of the island is composed of sandy or scoriaceous material that allows for rapid infiltration of water. Presently, little else is known about the island's groundwater.

The City of St. Paul obtains its municipal water supply from four wells located about 1.5 miles north-northeast of the city and immediately east of Telegraph Hill (Fredreka I, Fredreka II, south well, and north well). A fifth well serves the USCG station. These wells are reportedly completed within the basalt aquifer. The four municipal wells are connected by pipelines that supply three 200,000 gallon water storage tanks located on a hill above the city.

3.3 Site Description

The Former Aleut Bunkhouse, reportedly, was at one time the seal harvest worker housing (dormitory) serving the active rookery sites near the extreme northeastern end of St. Paul Island. Only the bunkhouse's concrete wall foundation still remains today, which is located about 1 mile from the eastern tip of the island, and only a few hundred yards from the Bering Sea shoreline to both the south and north. (Figure 1, Appendix 1).

The site is directly adjacent to the Polovina Turnpike situated atop a small hillock, covered with dense dune grass, and has a clear view in all directions.

3.3.1 Geology and Soil

The site is located in a sand dune environment, exposed on all sides and frequently scoured by strong winds. The thickness of the sand and the depth to bedrock are not known.

3.3.2 Surface Water and Groundwater

The nearest surface water body is the Bering Sea, which is about 0.20 miles or less both north and south of the site. No freshwater bodies are located at or near the site, though a small brackish pond can sometimes be seen just north of the bunkhouse site. The depth to groundwater at this site is not known, but is presumed to be close to the water surface of the pond and nearby sea level, which is approximately 20 to 35 feet below the ground surface at the Aleut Bunkhouse pad.

3.4 Previous Investigations And Other Activities

NORTECH is not aware of any previous investigations or studies at this building debris site. It is not a NOAA/ ADEC Two Party Agreement site, and there were no contacts or discussions with St. Paul residents during the fieldwork which led ***NORTECH*** to believe that the site had ever been the site of a spill or release which would result in contaminated soils or groundwater.

4.0 FIELDWORK ACTIVITIES

4.1 Debris Removal

After visiting the site and assessing its fieldwork circumstances on April 30, 2000 (Photo 1: Appendix 2, Site Photographs), ***NORTECH*** mobilized BSE workmen and suitable heavy equipment to the Former Aleut Bunkhouse on June 19th and began loading each of three end dump trucks with the wooden floor and wall debris to be hauled away and burned. (Appendix 3: Daily Reports) The building debris removal work proceeded all that day, and backfill efforts continued on into the next day, June 20th. Once the site cleanup was completed, pit-run scoria from Telegraph Hill was hauled in and placed as backfill up to approximately six inches below the top of the foundation wall, to make the site safe to walk upon. All equipment and personnel were then demobilized and site cleanup activities ended. (Photo 5)

A Hitachi 150 excavator on tracks was used to retrieve, lift and load the end-dump trucks with solid wastes (Photos 2 & 3). The trucks were used to haul the wood wastes from the site overland to the St. Paul Landfill (Photo 4). Later a burn permit was acquired from the City of St. Paul, and the accumulated wood waste was burned so that it would not take up space in the City's solid waste landfill. The few metallic waste items uncovered (specifically those with no historic value) were hauled away and placed at the solid waste/debris staging area at NOAA's "compound", south of the Polovina Turnpike, near the Post Office, for later transport off-island to recycling in Seattle. In addition, some general trash and miscellaneous solid wastes were exposed, which were hauled to and disposed of at the St. Paul Landfill. The largest item in this category was the building's chimney, comprised of firebrick and concrete, which can be seen stacked for loading by the excavator in Photo 6.

During the debris removal operations, a close watch was kept to assure that there were no unobserved hydrocarbon contaminants present within or directly under the debris from the collapsed wall and floor systems. As can be inferred from the contemporaneous Daily Reports and Site Photographs, no soil staining was observed at this site, and there were no evidences or odors present leading us to believe that the surface soils at the site had been contaminated with petroleum hydrocarbons or other contaminants incorporated within the wooden debris.

4.2 Soil and Groundwater Sampling

No soil or groundwater sampling or fieldscreening was attempted, since no evidences of contamination or suspect circumstances were observed while removing the building debris at this site.

5.0 DEBRIS AND SUSPECT SOILS DISPOSAL

5.1 Debris Disposal and Recycling

The wood wastes removed from this site, totaling approximately five end-dump truckloads, were stacked at a burn area set up within the St. Paul Landfill and later burned. A very small amount of metal debris removed from the Former Aleut Bunkhouse site was temporarily placed (staged) at the NOAA compound, as part of a large pile of metal debris behind the Garco warehouse and Combine Building. This metal debris was later reloaded and hauled in mid-September 2000 to a large walled barge at the St. Paul dock, which sailed to Seattle and was unloaded at the Seattle Iron & Metals yard on the Duwamish River at the end of September 2000. The assortment of steel,

copper, and aluminum items unloaded there were processed and recycled by the salvage yard. The Bunkhouse building's chimney pieces and a small assortment of other solid wastes not disposable by being burned were disposed of at the St. Paul Landfill.

5.2 Soil Disposal and Remediation Treatment

No soils were removed from the Former Aleut Bunkhouse site, for remediation or for any other purposes.

6.0 DISCUSSION

NORTECH completed the removal of all visible solid wastes, consisting primarily of simple wood debris, at the Former Aleut Bunkhouse, near the northeastern end of St. Paul Island, Alaska. The cleanup objectives outlined in the Corrective Action Plan for the Pribilof Islands Site Restoration Project and in Section 2.1 above were met, and it is anticipated that there are no contaminated soils or groundwater present at the cleanup site.

Care was taken to avoid spills or releases of any fuels or other fluids while working at the Former Aleut Bunkhouse site, and no evidence of any sort was discovered implying that this site had ever experienced any soil contamination. It does not appear to ***NORTECH*** that any further excavation or cleanup activities should be considered to be necessary at this time.

Care was taken to avoid spills and/or releases of automotive fluids during removal activities at the Former Aleut Bunkhouse site. Given the apparent absence of any soil contamination, it is ***NORTECH***'s professional opinion that no further excavation or cleanup activities are considered necessary at this site.

7.0 CONCLUSIONS AND RECOMMENDATIONS

NORTECH Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to the Former Aleut Bunkhouse site at St. Paul Island, Alaska, and administered a program of solid waste and debris removal, followed by scoria backfill, from June 19 to June 20, 2000. Several truckloads of solid wastes – mostly wooden debris - were extracted from the building foundation, loaded, and hauled away for disposal. The wooden wastes were burned, and the very limited quantity of metal debris removed was taken to the NMFS staging area for September 2000 transport by barge to Seattle, for recycling off-island. A concrete and firebrick chimney was loaded, transported and disposed of at the St. Paul Landfill.

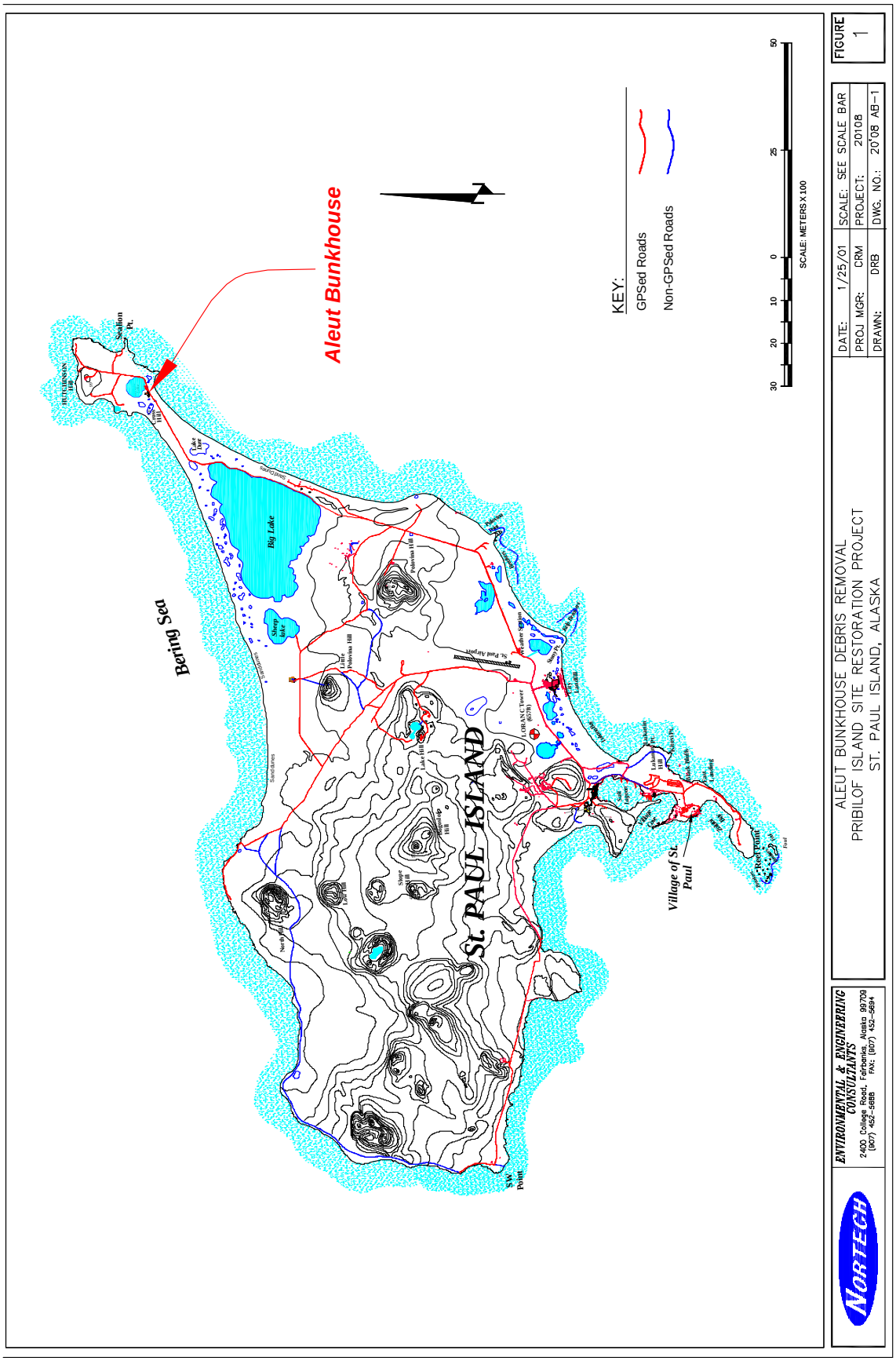
Based on a review and analysis of available project photographs and Daily Reports, ***NORTECH*** arrived at the following environmental conclusions:

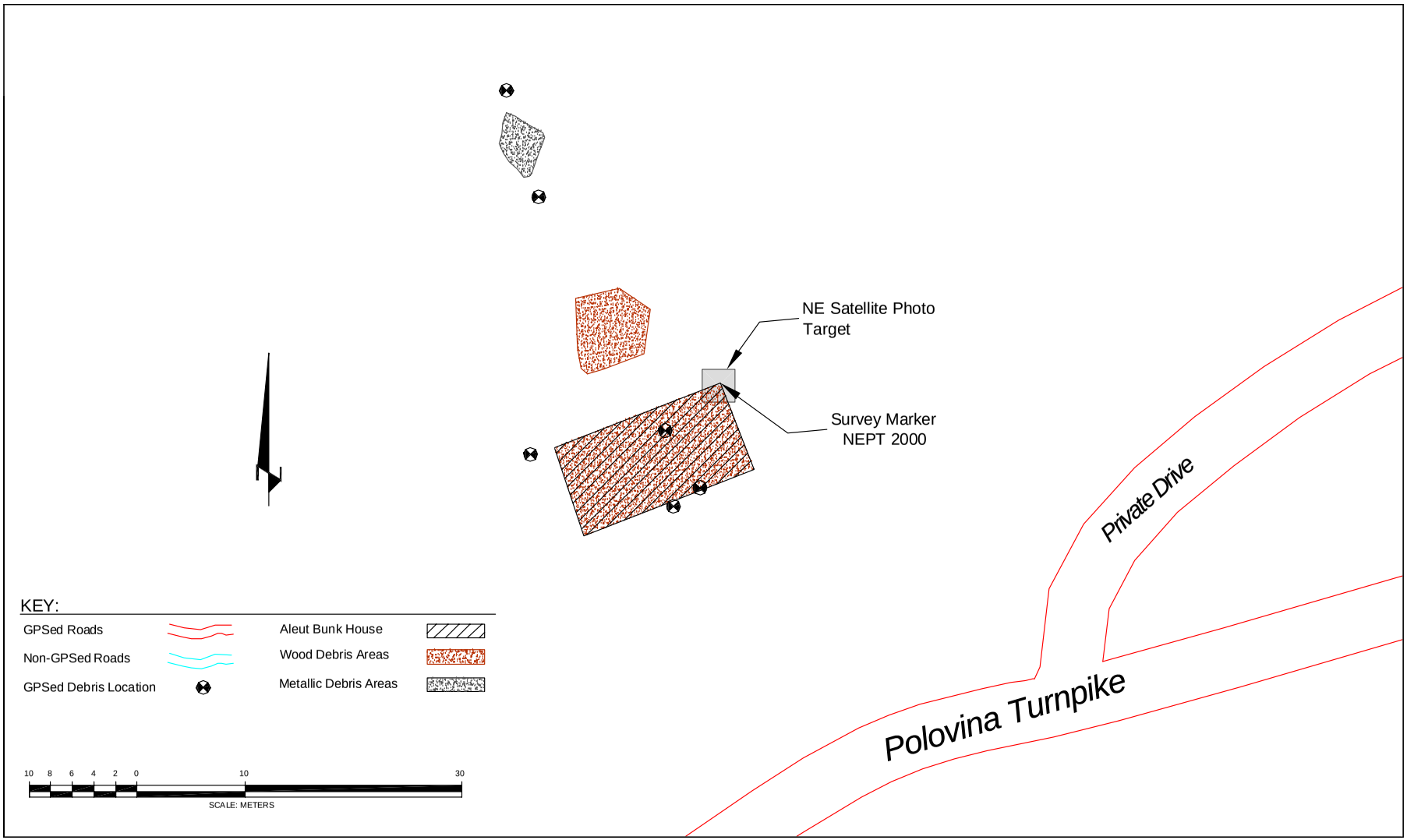
- No soils at the site of the Former Aleut Bunkhouse are suspected of being contaminated at a level greater than the applicable ADEC soil cleanup standards.
- Groundwater contamination is considered to be very unlikely at this debris removal site, given the lack of any evidence of the presence of any spills, leaks, or other petroleum hydrocarbon releases at this site.

Based on these conclusions, ***NORTECH*** recommends the following:

- No Further Action is necessary at this debris removal site.

APPENDIX 1: Figures & GPS Information





NORTECH

ENVIRONMENTAL & ENGINEERING CONSULTANTS
2400 College Road, Fairbanks, Alaska 99709
(907) 452-5688 FAX (907) 452-5694

FORMER ALEUT BUNKHOUSE DEBRIS REMOVAL
PRIBILOF ISLAND SITE RESTORATION PROJECT
ST. PAUL ISLAND, ALASKA

DATE:	1/17/01	SCALE:	1:8
PROJ MGR:	CRM	PROJECT:	20108
DRAWN:	DRB	DWG. NO.:	20108 AB-2

FIGURE 2

APPENDIX 2: Site Photographs

Photo 1: C52501D0.jpg: View of floor and wall system debris atop foundation walls. ("before")

Photo 2: C52506F0.jpg: Excavator removing wood debris from Bunkhouse site.

Photo 3: C52511F0.jpg: Excavator places debris into loader bucket outside foundation.

Photo 4: C52517F0.jpg: Loader transfers debris into end dump trucks to haul to landfill "burn pad."

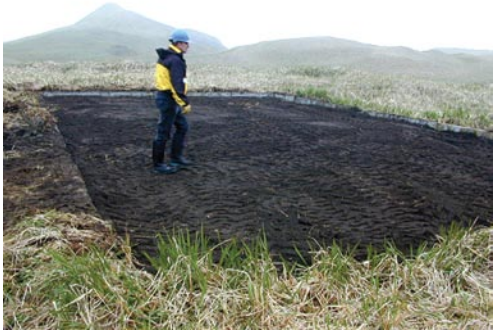


Photo 5: C52541F0.jpg: Aleut Bunkhouse foundation backfilled with scoria, site closed. (“after”)

Photo 6: C52542F0.jpg: Last debris removed, chimney sections & concrete chunks pulled out of foundation

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

TONY KNOWLES, GOVERNOR

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269-7552
Fax: (907) 269-7649
http://www.state.ak.us/dec/

March 2, 2001

RECEIVED
MAR 5 2001

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way, NE BIN C15700
Seattle, Washington 98115-0070

RE: Draft Site Closure Report Former Aleut Bunkhouse (Non Two Party Agreement Site) Pribilof Islands Site Restoration Project St. Paul Island, AK February 1, 2001

Dear Mr. Lindsay:

The Department of Environmental Conservation (DEC) has received the above document on February 21, 2001. Based on a review of the data presented in the report, ADEC concurs with the conclusion in section 7.0 that no further action is required at the site known as the Former Aleut Bunkhouse. However, if in the future, additional contamination is discovered at this site, further investigation and/or remedial actions will be requested of NOAA by ADEC. ADEC reserves its rights, under 18 AAC 75 Oil and Hazardous Substances Pollution Control regulations and AS 46.03 to require NOAA to conduct additional assessment and/or corrective actions, if information indicates the site conditions pose an unacceptable risk to human health, safety, or welfare, or to the environment.

If you have any questions regarding this letter, please call me at (907) 269-7552.

Sincerely,

Louis Howard

Louis Howard
Project Manager

cc: Jennifer Roberts, ADEC Anchorage
Robert A. Taylor, NOAA GC Seattle, WA
Brock Tostevin, AGO
Pribilof RAB Members

2001 former aleut bunkhouse closr rpt.doc NOAA St. Paul Non-TPA site Aleut Bunkhouse

NOAA Site 41
NTPA: Bulldozer in Bog

Site Closure Report – Final, Abandoned Bulldozer (Non Two-Party Agreement Site, Pribilof Islands Site Restoration, St. Paul Island, Alaska 989

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report Abandoned Bulldozer Non-Two Party Agreement (TPA) Site Pribilof Islands Site Restoration Project, St. Paul Island, AK March 7, 2001. Dated April 13, 2001.....1005

SITE CLOSURE REPORT - FINAL

Abandoned Bulldozer
(Non Two-Party Agreement Site)

Pribilof Islands Site Restoration
St. Paul Island, Alaska

June 6, 2001

Prepared For:
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office

Prepared By:

NORTECH

ENVIRONMENTAL & ENGINEERING CONSULTANT
Fairbanks, Alaska

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY 1

2.0 INTRODUCTION 1

2.1 Objectives 2
2.2 Methodology and Applicable Regulations 2

3.0 SITE BACKGROUND 2

3.1 Island Historical Information 2
3.2 Island Environmental Setting 3
3.2.1 Climate 3
3.2.2 Geology and Soil 3
3.2.3 Surface Water and Groundwater 4
3.3 Site Description 4
3.3.1 Geology and Soil 4
3.3.2 Surface Water and Groundwater 4
3.4 Previous Investigations And Other Activities 4

4.0 FIELDWORK ACTIVITIES 5

4.1 Debris Removal 5
4.2 Soil and Groundwater Sampling 5

5.0 DEBRIS AND SUSPECT SOILS DISPOSAL 5

5.1 Debris Disposal and Recycling 5
5.2 Soil Disposal and Remediation Treatment 6

6.0 DISCUSSION 6

7.0 CONCLUSIONS AND RECOMMENDATIONS 6

APPENDICES

Appendix 1: Figures & GPS Information
Appendix 2: Site Photographs
Appendix 3: Daily Reports (and Scrap Recycle Receipt)
Appendix 4: Laboratory Analytical Reports – not prepared for this debris site
Appendix 5: Site Video Documentation

1.0 EXECUTIVE SUMMARY

NORTECH Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to a non-TPA Site, the abandoned Bulldozer, which was awash in a small pond at St. Paul Island, Alaska. ***NORTECH*** administered a brief program of extraction and removal from April 21 to April 24, 2000. The Bulldozer was extracted from the pond, loaded, and hauled away for disposal as part of a bargeload of metal debris removed from St. Paul. Based on a review and analysis of available project photographs, Daily Reports, and the personnel memories, ***NORTECH*** arrived at the following environmental conclusions:

- The site's soils (pond bottom) are anticipated to be within ADEC cleanup standards because no signs or evidence of any petroleum hydrocarbon contamination was observed, on the pond or in the mud disturbed at the pond floor.

- Groundwater contamination is considered unlikely at this debris removal site, given the lack of any evidence of any spills, leaks, or other petroleum hydrocarbon releases since the bulldozer was abandoned in place approximately 40 years ago.

Based on these conclusions, ***NORTECH*** recommends the following:

- No Further Action at this debris removal site.

2.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration, is responsible for environmental restoration activities on St. Paul and St. George Islands, Alaska. Collectively, these islands are part of a five-island archipelago known as the Pribilof Islands. Under Public Law 104-91, NOAA is responsible for the cleanup of debris, landfills, wastes, storage tanks, hazardous and unsafe conditions, as well as contaminants including petroleum products and their derivatives left by NOAA on lands transferred or obligated for transfer on the Pribilof Islands. Affected properties are described in a two-party agreement (TPA) between NOAA and the Alaska Department of Environmental Conservation (ADEC) dated January 26, 1996 (NOAA 1996). Under State of Alaska environmental regulations and in accordance with the TPA, NOAA has undertaken an array of site characterization and restoration activities on St. Paul and St. George Islands. Additional work must be conducted to satisfy the TPA, including limited site characterization, remediation, confirmation sampling, and site restoration (NOAA 1996).

Under Contract No. 52ABNA500049, Task Order 56ABNA703706, ***NORTECH*** Environmental and Engineering Consultants (***NORTECH***) has prepared this Site Closure Report for the Abandoned Bulldozer Site, to report on the debris removal and environmental assessment activities which occurred during the 2000 fieldwork season.

2.1 Objectives

The overall objective for the St. Paul Debris Removal project undertaken by ***NORTECH*** was to develop a written plan of action, have it approved by NOAA and ADEC, and execute it for each TPA and non-TPA site. At each removal area ***NORTECH*** was to accomplish the acts necessary to gain a no-further-action designation from ADEC, or else gain an understanding of the corrective action efforts that could eventually lead to proper site closure.

2.2 Methodology and Applicable Regulations

In order to meet the project objective, ***NORTECH*** developed a draft Corrective Action Plan and an array of Sampling & Analysis Plans (SAPs) in March 2000 for eleven designated St. Paul debris sites. They were reviewed and approved by NOAA and ADEC, fieldwork was begun in mid-April, and completed by late November 2000. The fieldwork was performed in accordance with the Corrective Action Plan, the site's SAP, and the 1996 Two Party Agreement (TPA) between ADEC and NOAA including the following 1991 versions of ADEC's regulations and associated guidance documents, as referenced in the TPA, particularly sections 21 to 28, 59, and 103 which call for the application of:

- 18 Alaska Administrative Code (AAC) 70 - Water Quality Standards
- 18 AAC 75 - Oil and Hazardous Substances Pollution Control
- Underground Storage Tank Procedures Manual, Guidance for Treatment of Petroleum Contaminated Soil and Water and Standard Sampling Procedures

3.0 SITE BACKGROUND

This section provides a brief discussion of the location and history of the Pribilof Islands, weather and environmental conditions on St. Paul Island, a site description, and a summary of previous investigations ***NORTECH*** was aware of at this specific St. Paul debris removal site.

3.1 Island Historical Information

Russia first discovered St. Paul Island and its seal rookeries in 1786. In the 1820s, Russia established a settlement on St. Paul Island to support fur seal harvesting. The United States acquired the Pribilof Islands in 1867, when Alaska was purchased from Russia. In 1869, the United States made the Pribilof Islands a federal reservation. From 1869 to 1909, the United States contracted fur seal harvesting and pelt processing to private companies. From 1910 to 1979, the federal government was the sole operator and administrator of the Pribilof Islands. In 1971, the Alaska Native Claims Settlement Act passed, which provided for the transfer of property and management of the islands to Alaskan Native regional and village corporations.

The only major landowners on St. Paul Island are the Tanadgusix Corporation (TDX) and the federal government. Minor landowners include the City of St. Paul, the St. Paul Tribal Council, and the State of Alaska. The federal government currently retains title to about

1,515 acres on St. Paul Island, which consists of seal rookeries and administrative offices managed by the National Marine Fisheries Service, bird rookeries managed by the U.S. Fish & Wildlife Service, a U.S. Coast Guard (USCG) LORAN station, two scoria pits, the current landfill, and a National Weather Service station. The island's airport, which consists of about 67 acres of land, was conveyed to the State of Alaska in 1989.

3.2 Island Environmental Setting

St. Paul Island is located between latitude 57° 06' and 57° 15' North and longitude 170° 05' and 170° 25' West. It is surrounded by the Bering Sea, and is about 800 miles west-southwest of Anchorage and 300 miles north-northwest of Dutch Harbor, Alaska. The island is about 44 square miles in area (Figure 1). About 27 centerline miles of road bisect the island north-south and east-west. The City of St. Paul is located on the southern peninsula of the island; its 1998 population included 761 people (ADL 1999). St. Paul Island has many sand dunes and is vegetated with grasses and small forbes over the majority of its area. The vegetation is broadly classified as moist tundra. Some common plant species present on the island include blue lupine, arctic poppy, beach wild rye, and sea beach sandwort.

St. Paul Island serves as a nesting area for a great number of seabirds and a rookery area for northern fur seals. Commercial crab harvesting areas are located within 15 miles of the island. Major harvest species are the Tanner crab and Korean Hair crab.

3.2.1 Climate

The climate of the island is classified as subpolar. Maritime weather conditions prevail on the island, with predominantly cloudy, foggy, and windy conditions. Total annual precipitation averages 23.3 inches, with most occurring between the months of April and October. The mean monthly temperature ranges from 22.4°F in winter to 47.8°F in summer, with a mean annual temperature of 34.8°F. Wind speeds range from nil to over 100 miles per hour, with an average of 17.2 miles per hour (NCDC 1999).

3.2.2 Geology and Soil

St. Paul Island is composed of basaltic lava flows and sills overlain by a thin veneer of tuffaceous and scoriaceous material, glacial sediment, and sandy material that has formed dunes on the eastern portion of the island. A number of cinder cones rise to a maximum elevation of 665 feet. The cones are moderately steep-sided, with several having craters at their summits. A gently rolling topography, averaging 200 feet in elevation, occurs between the cones.

The shoreline along the Bering Sea ranges from rocky sea cliffs and headlands to short, steep beaches and is generally composed of cobbles, gravel, and sand. The shoreline of the western portion of the island is generally rocky sea cliffs and headlands, with beach shoreline and back dunes present in other portions.

3.2.3 Surface Water and Groundwater

Many lakes are located on St. Paul Island, but no streams are known to exist. The largest lake, Big Lake, is located on the northeastern part of the island. Sheep Lake is located west of Big Lake. Other smaller lakes are located in the southern portion of the island. The lakes with direct estuarine connection to the Bering Sea (for example, the Salt Lagoon) tend to be brackish; the remaining lakes are freshwater. Much of the surface of the island is composed of sandy or scoriaceous material that allows for rapid infiltration of water. Presently, little else is known about the island's groundwater.

The City of St. Paul obtains its municipal water supply from four wells located about 1.5+ miles northeast of the city and immediately east of Telegraph Hill (Fredreka I, Fredreka II, south well, and north well). A fifth well serves the USCG LORAN station. These wells are reportedly completed within the basalt aquifer. The four municipal wells are connected by pipelines that supply three 200,000-gallon water storage tanks located on a hill above the city.

3.3 Site Description

The abandoned Bulldozer "site" is <u>not</u> referenced as a debris site under the Two Party Agreement. It is located in the midst of a small pond just west of the St. Paul United States Coast Guard LORAN complex, and approximately 2 miles northeast of the city center. (Figure 1, Appendix 1) The nearest ocean shoreline is Lukanin Bay, about 0.5 miles to the southeast. The site had only a single significant item of debris to be removed, the abandoned bulldozer, along with a single, empty 55-gallon drum.

3.3.1 Geology and Soil

The site is located in a pond, surrounded by a marshy tundra environment, with sandy soils underlying the well-established grasses, and sand dunes across the Polovina Turnpike to the south. The thickness of the sand zone and the depth to bedrock are not known. It is anticipated that the strata underlying the pond are the same as those noted when the City's water wells were drilled and placed into service.

3.3.2 Surface Water and Groundwater

The nearest surface water body is an unnamed pond, within which the Bulldozer was abandoned. This lake appeared to be freshwater, and is adjacent to the water well area used to extract drinking water for the use of the residents of St. Paul. The depth to groundwater at the site was essentially zero, since the (frozen) water surface of the pond was approximately at the top of the bulldozer's seat and engine cover. The dozer's two hydraulic rams for the dozer blade extended above the ice surface, but little else, at the time of initial observation. (Photos 1 and 2, Appendix 2, Site Photographs)

3.4 Previous Investigations And Other Activities

The only previous information found by ***NORTECH*** regarding this Bulldozer indicated that it was abandoned in-place after falling through the ice covering the pond, while walking

cross-country in the winter sometime in the late 1960's. No previous assessment reports or environmental data was available or reported to exist.

4.0 FIELDWORK ACTIVITIES

4.1 Debris Removal

During frozen, winter conditions, to protect the tundra being crossed, ***NORTECH*** mobilized a GPS unit to locate the Bulldozer's exact position, and then brought in BSE workmen and several pieces of heavy equipment to the abandoned Bulldozer site on the morning of April 21, 2000. (Photo 3, Appendix 2: Site Photographs) After walking in to the Bulldozer's position from the roadway, BSE's Hitachi 150 excavator and crew began demolishing and "rolling" the Bulldozer toward the shore of the pond, and then hauling the pieces over the ridge of the pond "bowl" to be loaded into an end-dump truck. (Photos 4, 5 and 6; and Appendix 3: Daily Reports) The Bulldozer was removed, and the pieces placed in the staging area for later loading and removal by barge to Seattle. A single, empty 55-gallon drum observed in the pond area was also removed during this debris extraction session. All cleanup and closure work was completed, and the crew was demobilized from this site, on April 24, 2000. (Photo 7)

Later, on July 13th, a ***NORTECH*** employee returned to the site to photograph the summer condition of the path used by the heavy equipment used to accomplish the Bulldozer extraction efforts. (Photo 8) Damage to the grassy terrain crossed by the equipment was kept to a minimum. No soils under or around the Bulldozer were excavated, nor was any fill placed in the wetlands being traversed by the excavator and loader used for this task.

4.2 Soil and Groundwater Sampling

No analytical, or photoionization detector field-screening, sampling was performed at this debris extraction site. During the Bulldozer removal operations, no odors, soil staining, stressed vegetation, sheens or rainbows on the water surfaces, or any other evidences of spills or past fluid releases from any sources were observed.

5.0 DEBRIS AND SUSPECT SOILS DISPOSAL

5.1 Debris Disposal and Recycling

The metal debris removed from the pond at the abandoned Bulldozer site was temporarily staged on Tract 50 (the NOAA "compound"), as part of a large metal debris pile behind the Garco warehouse and Combine Building. In mid-September 2000, this metal debris was transported to a large walled barge at the St. Paul dock. The barge was towed to Seattle and was unloaded at the Seattle Iron & Metals yard on the Duwamish River at the end of September 2000. All of the steel and iron items transported to this yard were processed and

recycled by the salvage yard. (See receipt for recycled metals from Seattle Iron & Metals in Appendix 3: Daily Reports)

5.2 Soil Disposal and Remediation Treatment

No soils were excavated, placed, or removed from this site for disposal or treatment.

6.0 DISCUSSION

NORTECH completed the removal of the Bulldozer, and all visible solid wastes and general debris associated with the Bulldozer that were found above the ground surface and pond bottom at the Bulldozer site. The cleanup objectives outlined in the Corrective Action Plan prepared by ***NORTECH*** for the Pribilof Islands Site Restoration Project and stated in Section 2.1 above were met, although no PID fieldscreening was performed, nor were any soil or water samples collected or analyzed by an off-site laboratory. Given the winter conditions at the site PID fieldscreening was felt to be of little detection use, and the due to the total absence of any evidences of contamination – either of the soil or water at this site - soil sampling was deemed to be unnecessary.

7.0 CONCLUSIONS AND RECOMMENDATIONS

NORTECH Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to a non-TPA Site, the abandoned Bulldozer, which was awash in a small pond at St. Paul Island, Alaska. ***NORTECH*** administered a brief program of extraction and removal from April 21 to April 24, 2000. The Bulldozer was extracted from the pond, loaded, and hauled away for disposal as part of a bargeload of metal debris removed from St. Paul. Based on a review and analysis of available project photographs, Daily Reports, and the personnel memories, ***NORTECH*** arrived at the following environmental conclusions:

- The site's soils (pond bottom) are anticipated to be within ADEC cleanup standards because no signs or evidence of any petroleum hydrocarbon contamination was observed, on the pond or in the mud disturbed at the pond floor.

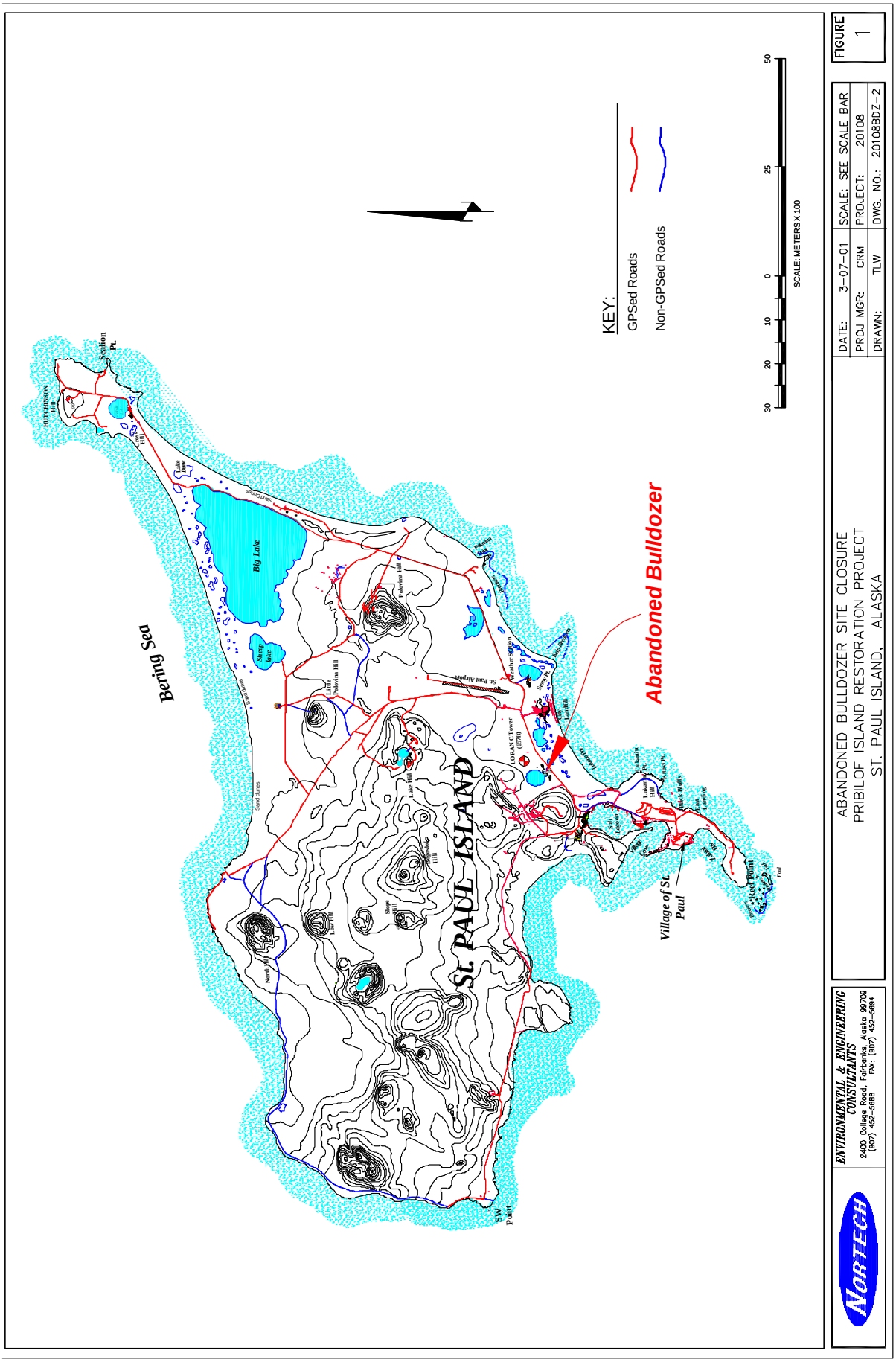
- Groundwater contamination is considered unlikely at this debris removal site, given the lack of any evidence of any spills, leaks, or other petroleum hydrocarbon releases since the bulldozer was abandoned in place approximately 40 years ago.

Based on these conclusions, ***NORTECH*** recommends the following:

- No Further Action at this debris removal site.

APPENDIX 1

Figures & GPS Information



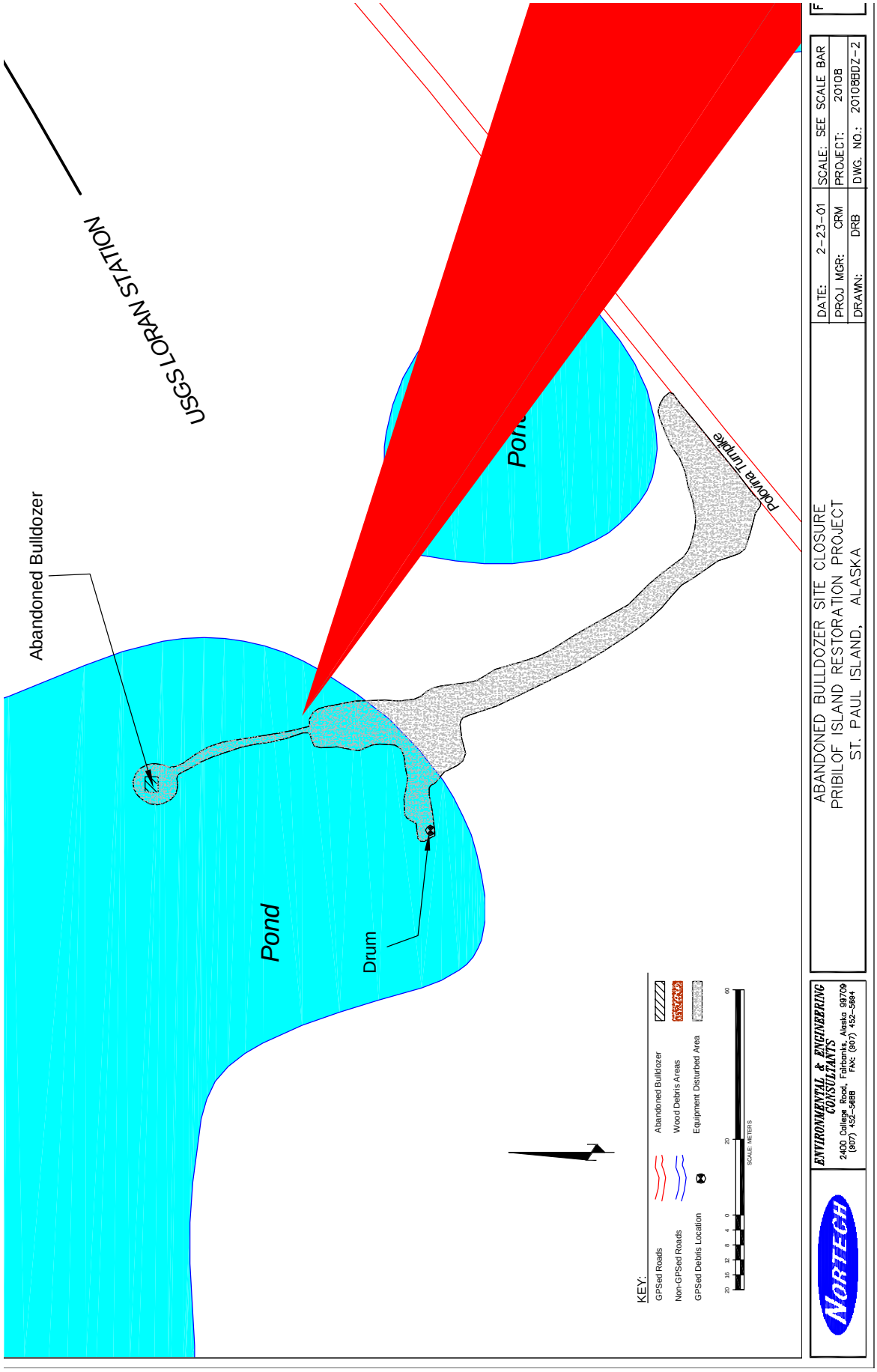
ABANDONED BULLDOZER SITE CLOSURE
PRIBILOF ISLAND RESTORATION PROJECT
ST. PAUL ISLAND, ALASKA

DATE:	3-07-01	SCALE: SEE SCALE BAR	
PROJ MGR:	CRM	PROJECT:	20108
DRAWN:	TLW	DWG. NO.:	20108BDZ-2

FIGURE 1

NORTECH

ENVIRONMENTAL & ENGINEERING CONSULTANTS
2400 College Road, Fairbanks, Alaska 99709
(907) 452-5688 FAX: (907) 452-5694


USGS LORAN STATION
Abandoned Bulldozer
Pond
Drum
Pond
Polvina Turnpike
KEY:
GPSed Roads
Non-GPSed Roads
GPSed Debris Location
Abandoned Bulldozer
Wood Debris Areas
Equipment Disturbed Area
20 16 12 8 4 0 20 60
SCALE: METERS
NORTECH
ENVIRONMENTAL & ENGINEERING CONSULTANTS
2400 College Road, Fairbanks, Alaska 99709
(907) 452-5688 FAX: (907) 452-5694
ABANDONED BULLDOZER SITE CLOSURE
PRIBILOF ISLAND RESTORATION PROJECT
ST. PAUL ISLAND, ALASKA
DATE: 2-23-01
PROJ MGR: CRM
DRAWN: DRB
SCALE: SEE SCALE BAR
PROJECT: 2010B
DWG. NO.: 2010BBDZ-2

APPENDIX 2

Site Photographs

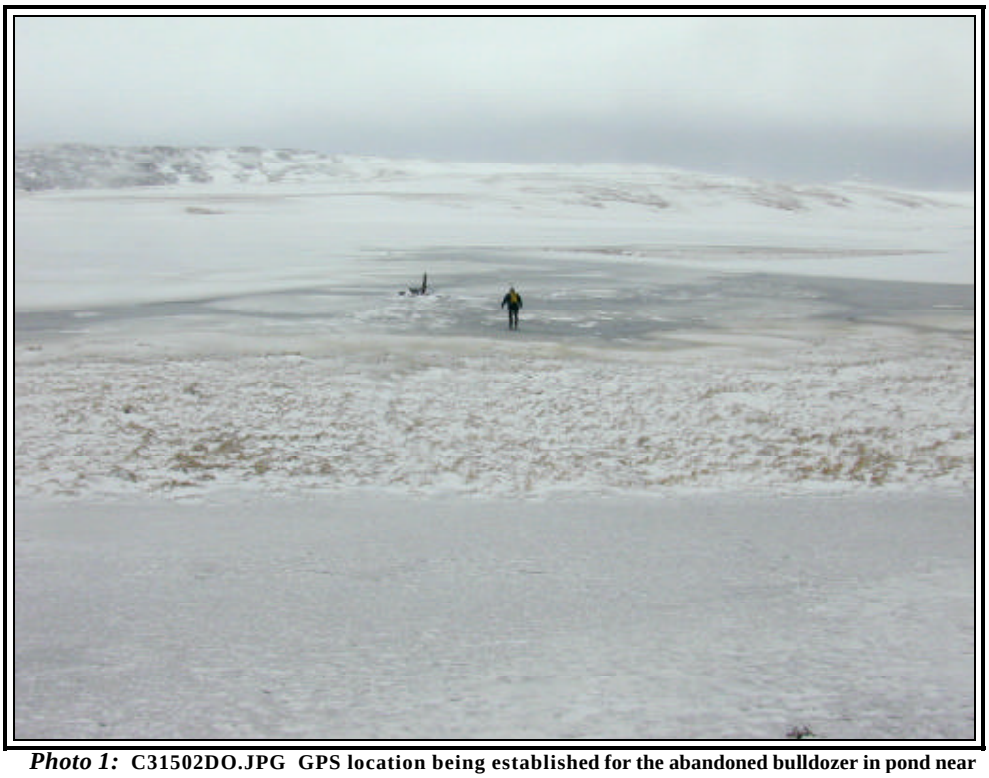


Photo 1: **C31502DO.JPG GPS location being established for the abandoned bulldozer in pond near LORAN.**

Photo 2: **C31505DO.JPG View of undisturbed bulldozer, frozen 4' deep, to, hood, middle of seat, and fuel tank.**

Photo 3: **C31508DO.JPG Hitachi 150 excavator "rolling" the dozer to break suction of mud at pond bottom.**

Photo 4: **C31510DO.JPG Excavator carries various pieces of the dozer to ridge above pond basin.**

Photo 5: **C31518DO.JPG Excavator loads portions of the dozer to loader, to be hauled to roadside trucks.**

Photo 6: **C31519DO.JPG BSE Equipment completes dozer haul out - note minimal damage to frozen grassy path.**

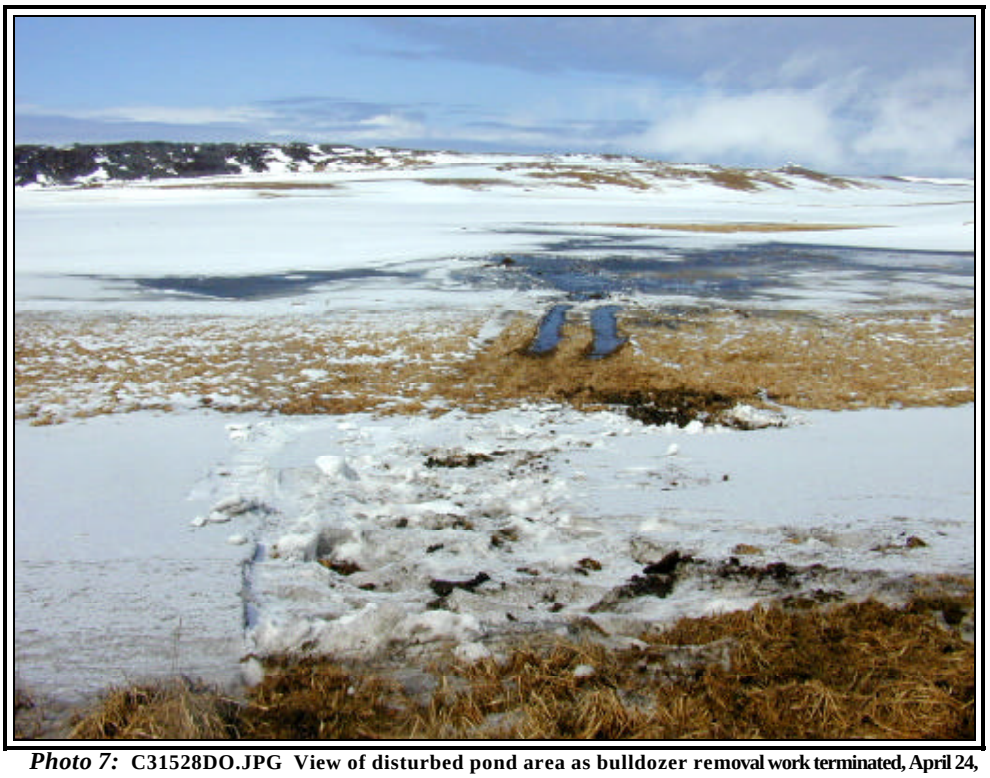


Photo 7: **C31528DO.JPG View of disturbed pond area as bulldozer removal work terminated, April 24, 2000.**

Photo 8: **C31501GO.JPG View of pond in July 2000 – minimal damage to environment observable.**

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

TONY KNOWLES, GOVERNOR
555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269-7552
Fax: (907) 269-7649
http://www.state.ak.us/dec/

April 13, 2001

RECE VED
APR 23 2001

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way, NE BIN C15700
Seattle, Washington 98115-0070

RE: Draft Site Closure Report Abandoned Bulldozer Non-Two Party Agreement (TPA) Site Pribilof Islands Site Restoration Project St. Paul Island, AK March 7, 2001

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (ADEC) has received the above document on April 2, 2001. Based on a review of the data presented in the report, ADEC concurs with the Section 7.0 "Conclusions and Recommendations" that no further action is required at the Abandoned Bulldozer (a non-TPA site). However, if in the future, additional contamination is discovered at this site, further investigation and/or remedial actions will be requested of NOAA by ADEC. ADEC reserves its rights, under 18 AAC 75 Oil and Other Hazardous Substances Pollution Control regulations and AS 46.03 to require NOAA to conduct additional assessment and/or corrective actions, if information indicates the site conditions pose an unacceptable risk to human health, safety, or welfare, or to the environment.

If you have any questions regarding this letter, please call me at (907) 269-7552.

Sincerely,

Louis Howard
Project Manager

cc: Jennifer Roberts, ADEC Anchorage
Breck Tostevin, AGO
Pribilof RAB Members

2001 abandoned bulldozer clsre rpt.doc

NOAA-St. Paul Non-TPA site abandoned bulldozer genl corr

NOAA Site 42
NTPA: Explosives Storage Bunker

Site Closure Report – Final, Concrete Storage Bunker – Explosives Discovery & Demolition (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska 1009

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report Concrete Storage Bunker-Explosives Discovery & Demolition Non-Two Party Agreement (TPA) Site Pribilof Islands Site Restoration Project, St. Paul Island AK March 27, 2001. Dated April 13, 2001.....1019

SITE CLOSURE REPORT - FINAL

Concrete Storage Bunker – Explosives Discovery & Demolition
(Non Two-Party Agreement Site)

Pribilof Islands Site Restoration
St. Paul Island, Alaska

June 6, 2001

Prepared For:
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office

Prepared By:

ENVIRONMENTAL & ENGINEERING CONSULTANTS
Fairbanks, Alaska

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY 1011
2.0 INTRODUCTION 1011
2.1 Objectives 1011
2.2 Methodology and Applicable Regulations 1011
3.0 SITE BACKGROUND 1012
3.1 Island Historical Information 1012
3.2 Island Environmental Setting 1012
3.2.1 Climate 1012
3.2.2 Geology and Soil 1013
3.2.3 Surface Water and Groundwater 1013
3.3 Site Description 1013
3.3.1 Geology and Soil 1013
3.3.2 Surface Water and Groundwater 1013
3.4 Previous Investigations And Other Activities 1013
4.0 FIELDWORK ACTIVITIES 1014
4.1 Debris Removal 1014
4.2 Soil and Groundwater Sampling 1014
5.0 DEBRIS AND SUSPECT SOILS DISPOSAL 1014
5.1 Debris Disposal and Recycling 1014
5.2 Soil Disposal and Remediation Treatment 1014
6.0 DISCUSSION 1014
7.0 CONCLUSIONS AND RECOMMENDATIONS 1015

APPENDICES

Appendix 1: Figures & GPS Information
Appendix 2: Site Photographs
Appendix 3: Daily Reports
Appendix 4: Laboratory Analytical Reports – not prepared for this debris site
Appendix 5: Site Video Documentation

1.0 EXECUTIVE SUMMARY

NORTECH Environmental and Engineering Consultants and two experienced explosive ordnance demolition personnel from the Ft. Richardson Army base in Anchorage, Alaska, mobilized to a non-TPA Site, the Concrete Storage Bunker at St. Paul Island, Alaska. ***NORTECH*** aided the Army team as they accomplished a brief program of stored explosives removal, transport and demolition on July 12 and 13, 2000. The recently discovered blasting caps, estimated to total approximately 2,220 caps, were inspected, evaluated and then hauled to the isolated Big Polovina scoria pit for disposal by incineration and demolition. Based on a review and analysis of available project photographs, Daily Reports, and our personnel's memories, ***NORTECH*** arrived at the following environmental conclusions:

- The site's soils are expected to be uncontaminated and within ADEC cleanup standards because no signs or evidence of any petroleum hydrocarbon contamination was observed during the bunker cleanout operation.
- Groundwater contamination is considered to be very unlikely at this explosives removal site, given the lack of any evidence of any spills, leaks, or other petroleum hydrocarbon releases at the site.

Based on these conclusions, ***NORTECH*** recommends the following:

- No Further Action at this explosives removal site.

2.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration, is responsible for environmental restoration activities on St. Paul and St. George Islands, Alaska. Collectively, these islands are part of a five island archipelago known as the Pribilof Islands. Under Public Law 104-91, NOAA is responsible for the cleanup of debris, landfills, wastes, storage tanks, hazardous and unsafe conditions, as well as contaminants including petroleum products and their derivatives left by NOAA on lands transferred or obligated for transfer on the Pribilof Islands. Affected properties are described in a two party agreement (TPA) between NOAA and the Alaska Department of Environmental Conservation (ADEC) dated January 26, 1996 (NOAA 1996). Under State of Alaska environmental regulations and in accordance with the TPA, NOAA has undertaken an array of site characterization and restoration activities on St. Paul and St. George Islands. Additional work must be conducted to satisfy the TPA, including limited site characterization, remediation, confirmation sampling, and site restoration (NOAA 1996).

Under Contract No. 52ABNA500049, Task Order 56ABNA703706, ***NORTECH*** Environmental and Engineering Consultants (***NORTECH***) has prepared this Site Closure Report for the Concrete Storage Bunker, on the debris removal and environmental assessment activities which occurred during the 2000 fieldwork season.

2.1 Objectives

The overall objective for the St. Paul Debris Removal project undertaken by ***NORTECH*** was to develop a written plan of action, have it approved by NOAA and ADEC, and execute it for each TPA and non-TPA site. At each removal area ***NORTECH*** was to accomplish the acts necessary to gain a no-further-action designation from ADEC, or else gain an understanding of the corrective action efforts that could eventually lead to proper site closure.

2.2 Methodology and Applicable Regulations

In order to meet the project objective, ***NORTECH*** developed a draft Corrective Action Plan and an array of Sampling & Analysis Plans (SAPs) in March 2000 for eleven designated St. Paul debris sites. They were reviewed and approved by NOAA and ADEC, fieldwork was begun in mid-April, and completed by late November 2000. The fieldwork was performed in accordance with the Corrective Action Plan, the site's SAP, and the 1996 Two Party Agreement (TPA) between ADEC and NOAA including the following 1991 versions of ADEC's regulations

and associated guidance documents, as referenced in the TPA, particularly sections 21 to 28, 59, and 103 which call for the application of:

- 18 Alaska Administrative Code (AAC) 70 Water Quality Standards
- 18 AAC 75 Oil and Hazardous Substances Pollution Control
- Underground Storage Tank Procedures Manual, Guidance for Treatment of Petroleum Contaminated Soil and Water and Standard Sampling Procedures

3.0 SITE BACKGROUND

This section provides a brief discussion of the location and history of the Pribilof Islands, weather and environmental conditions on St. Paul Island, a site description, and a summary of previous investigations ***NORTECH*** was aware of at this specific St. Paul debris removal site.

3.1 Island Historical Information

Russia first discovered St. Paul Island and its seal rookeries in 1786. In the 1820s, Russia established a settlement on St. Paul Island to support fur seal harvesting. The United States acquired the Pribilof Islands in 1867, when Alaska was purchased from Russia. In 1869, the United States made the Pribilof Islands a federal reservation. From 1869 to 1909, the United States contracted fur seal harvesting and pelt processing to private companies. From 1910 to 1979, the federal government was the sole operator and administrator of the Pribilof Islands. In 1971, the Alaska Native Claims Settlement Act passed, which provided for the transfer of property and management of the islands to Alaskan Native regional and village corporations.

The only major landowners on St. Paul Island are the Tanadgusix Corporation (TDX) and the federal government. Minor landowners include the City of St. Paul, the St. Paul Tribal Council, and the State of Alaska. The federal government currently retains title to about 1,515 acres on St. Paul Island, which consists of seal rookeries and administrative offices managed by the National Marine Fisheries Service, bird rookeries managed by the U.S. Fish & Wildlife Service, a U.S. Coast Guard (USCG) LORAN station, two scoria pits, the current landfill, and a National Weather Service station. The island's airport, which consists of about 67 acres of land, was conveyed to the State of Alaska in 1989.

3.2 Island Environmental Setting

St. Paul Island is located between latitude 57° 06' and 57° 15' North and longitude 170° 05' and 170° 25' West. It is surrounded by the Bering Sea, and is about 800 miles west southwest of Anchorage and 300 miles north northwest of Dutch Harbor, Alaska. The island is about 44 square miles in area (Figure 1). About 27 centerline miles of road bisect the island north south and east west. The City of St. Paul is located on the southern peninsula of the island; its 1998 population included 761 people (ADL 1999). St. Paul Island has many sand dunes and is vegetated with grasses and small forbes over the majority of its area. The vegetation is broadly classified as moist tundra. Some common plant species present on the island include blue lupine, arctic poppy, beach wild rye, and sea beach sandwort.

St. Paul Island serves as a nesting area for a great number of seabirds and a rookery area for northern fur seals. Commercial crab harvesting areas are located within 15 miles of the island. Major harvest species are the Tanner crab and Korean Hair crab.

3.2.1 Climate

The climate of the island is classified as subpolar. Maritime weather conditions prevail on the island, with predominantly cloudy, foggy, and windy conditions. Total annual precipitation averages 23.3 inches, with most occurring between the months of April and October. The mean monthly temperature ranges from 22.4°F in winter to 47.8°F in summer, with a mean annual temperature of 34.8°F. Wind speeds range from nil to over 100 miles per hour, with an average of 17.2 miles per hour (NCDC 1999).

3.2.2 Geology and Soil

St. Paul Island is composed of basaltic lava flows and sills overlain by a thin veneer of tuffaceous and scoriaceous material, glacial sediment, and sandy material that has formed dunes on the eastern portion of the island. A number of cinder cones rise to a maximum elevation of 665 feet. The cones are moderately steep sided, with several having craters at their summits. A gently rolling topography, averaging 200 feet in elevation, occurs between the cones.

The shoreline along the Bering Sea ranges from rocky sea cliffs and headlands to short, steep beaches and is generally composed of cobbles, gravel, and sand. The shoreline of the western portion of the island is generally rocky sea cliffs and headlands, with beach shoreline and back dunes present in other portions.

3.2.3 Surface Water and Groundwater

Many lakes are located on St. Paul Island, but no streams are known to exist. The largest lake, Big Lake, is located on the northeastern part of the island. Sheep Lake is located west of Big Lake. Other smaller lakes are located in the southern portion of the island. The lakes with direct estuarine connection to the Bering Sea (for example, the Salt Lagoon) tend to be brackish; the remaining lakes are freshwater. Much of the surface of the island is composed of sandy or scoriaceous material that allows for rapid infiltration of water. Presently, little else is known about the island's groundwater.

The City of St. Paul obtains its municipal water supply from four wells located about 1.5+ miles northeast of the city and immediately east of Telegraph Hill (Fredreka I, Fredreka II, south well, and north well). A fifth well serves the USCG LORAN station. These wells are reportedly completed within the basalt aquifer. The four municipal wells are connected by pipelines that supply three 200,000 gallon water storage tanks located on a hill above the city.

3.3 Site Description

The Concrete Bunker is <u>not</u> referenced as a debris site under the Two Party Agreement. It is located directly across the Polovina Turnpike from the NOAA "compound", also known as Tract 50, and is approximately 1/2 mile northeast of the city center. (Figure 1, Appendix 1) The nearest ocean shoreline is Village Cove, about 0.15 miles to the west, beyond the NOAA buildings and compound.

This site had only a single type of "debris" to be removed, which was an array of long-stored explosive blasting caps. Some minor, miscellaneous items such as the wooden storage box, a wooden pallet, and handfuls of other metallic junk were also removed from the bunker, leaving it completely empty.

3.3.1 Geology and Soil

The site is located in a grassy roadside area at the base of the hill called Ellerman Heights, with sandy soils underlying the dense, well-established marsh grasses covering the immediate area. The thickness of the sand zone and the depth to bedrock are not known.

3.3.2 Surface Water and Groundwater

The nearest surface water body to the site is the Salt Lagoon, which is connected by a narrow channel to the St. Paul harbor and Village Cove. (Figure 2, Appendix 1) Daily tides move ocean saltwater in and out of the Salt Lagoon. There is no fresh water near this debris removal site. The depth to groundwater at the site is unknown, but is presumed to be close to the water surface of the nearby Salt Lagoon and sea level, which is approximately 10 to 13 feet below the ground surface at the concrete bunker.

3.4 Previous Investigations And Other Activities

No previous assessment reports or environmental data was available or reported to exist regarding this roadside concrete storage bunker.

4.0 FIELDWORK ACTIVITIES

4.1 Debris Removal

NORTECH mobilized two site cleanup personnel and a pickup truck to the concrete storage bunker site on July 12, 2000, to facilitate and assist with the evaluation and removal of the stored blasting caps, which had been discovered the previous day. (Photo 1, Appendix 2: Site Photographs)

After using a battery-powered screwdriver to remove the plywood panel that secured the doorway of the concrete bunker, the two-man Army ordnance demolition team (who had flown in that day from Ft. Richardson in Anchorage) inspected the stored blasting caps. (Photos 2 and 3; and Appendix 3: Daily Reports) The boxes of electric and non-electric caps were examined to determine if it was safe to move them for destruction away from the bunker and adjacent populated area. Close inspection by the Army team of the various blasting cap containers indicated that the caps dated to as far back as 1948 and were safe enough to transport to NOAA's Big Polovina scoria material pit (Tract 38) for incineration and demolition. (Photo 4)

NORTECH's pickup truck was used to transport the caps to the isolated scoria pit, and the ordnance demolition team spent most of the next 24 hours burning and exploding the blasting caps. At the time of this demolition effort, the Army team estimated that there were a total of approximately 2,220 blasting caps stored in the concrete bunker. Video footage of the blasting cap demolition was taken by NOAA personnel at the scoria pit.

All bunker cleanup and site closure work was completed, and the Army ordnance demolition team personnel involved with this explosives evaluation and demolition effort were demobilized by air from St. Paul on July 13, 2000.

4.2 Soil and Groundwater Sampling

No analytical laboratory work, or photoionization detector field-screening/sampling was performed at this explosive materials removal/cleanup site. During the blasting cap removal operations, no odors, soil staining, stressed vegetation, sheens or rainbows on the water surfaces, or any other evidences of spills or past fluid releases from any sources were observed.

5.0 DEBRIS AND SUSPECT SOILS DISPOSAL

5.1 Debris Disposal and Recycling

The blasting caps and miscellaneous wood and trash removed from the concrete storage bunker site were all disposed of on-island. The wood items were transported and burned at the Landfill, as part of a series of large wooden debris burns coordinated with the City of St. Paul. The blasting caps were destroyed at the Big Polovina scoria pit by incineration and explosion – as determined by the Army ordnance demolition team. All remaining scraps of lead wires and shards of metal (what little remained after the caps were all exploded) were collected up and disposed of at the City Landfill.

5.2 Soil Disposal and Remediation Treatment

No soils were excavated, placed, or removed from this site for disposal or treatment.

6.0 DISCUSSION

NORTECH aided the Ft. Richardson explosive ordnance demolition team in completing the removal and demolition of the stored blasting caps, and all other miscellaneous solid general debris associated with the Concrete Bunker site. The cleanup objectives outlined in the Corrective Action Plan prepared by ***NORTECH*** for the Pribilof

Islands Site Restoration Project and stated in Section 2.1 above were met, although no PID fieldscreening was performed, nor were any soil or water samples collected or analyzed by an off-site laboratory.

Given the absence of any impressions or information regarding suspicion of contaminated conditions at the site, PID fieldscreening was not deemed to be necessary, and the total absence of any evidences of contamination – either of the soil or water at this site – led ***NORTECH*** to believe that soil sampling was also unnecessary.

7.0 CONCLUSIONS AND RECOMMENDATIONS

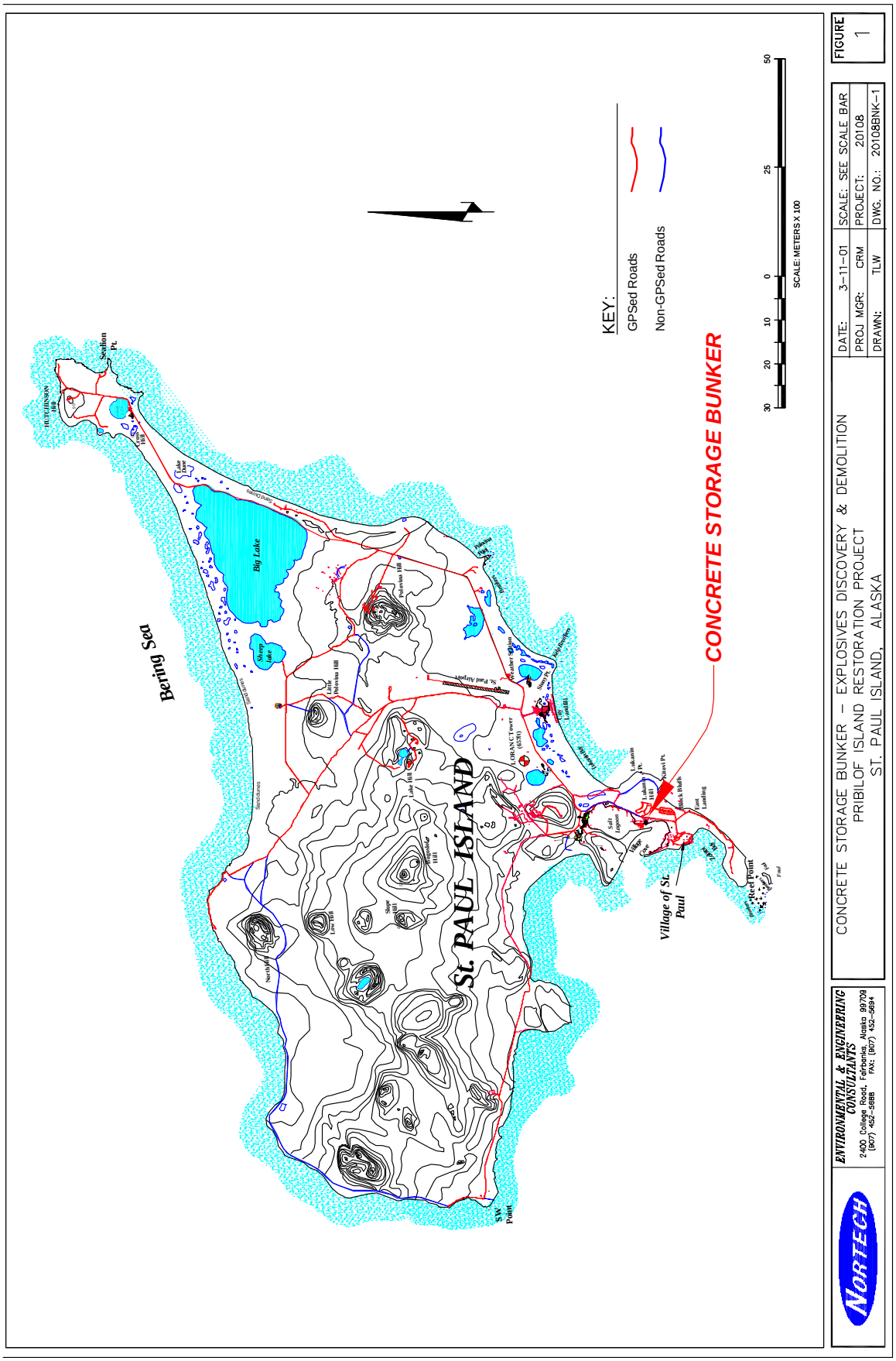
NORTECH Environmental and Engineering Consultants and two experienced explosive ordnance demolition personnel from the Ft. Richardson Army base in Anchorage, Alaska, mobilized to a non-TPA Site, the Concrete Storage Bunker at St. Paul Island, Alaska. ***NORTECH*** aided the Army team as they accomplished a brief program of stored explosives removal, transport and demolition on July 12 and 13, 2000. The recently discovered blasting caps, estimated to total approximately 2,220 caps, were inspected, evaluated and then hauled to the isolated Big Polovina scoria pit for disposal by incineration and demolition. Based on a review and analysis of available project photographs, Daily Reports, and our personnel's memories, ***NORTECH*** arrived at the following environmental conclusions:

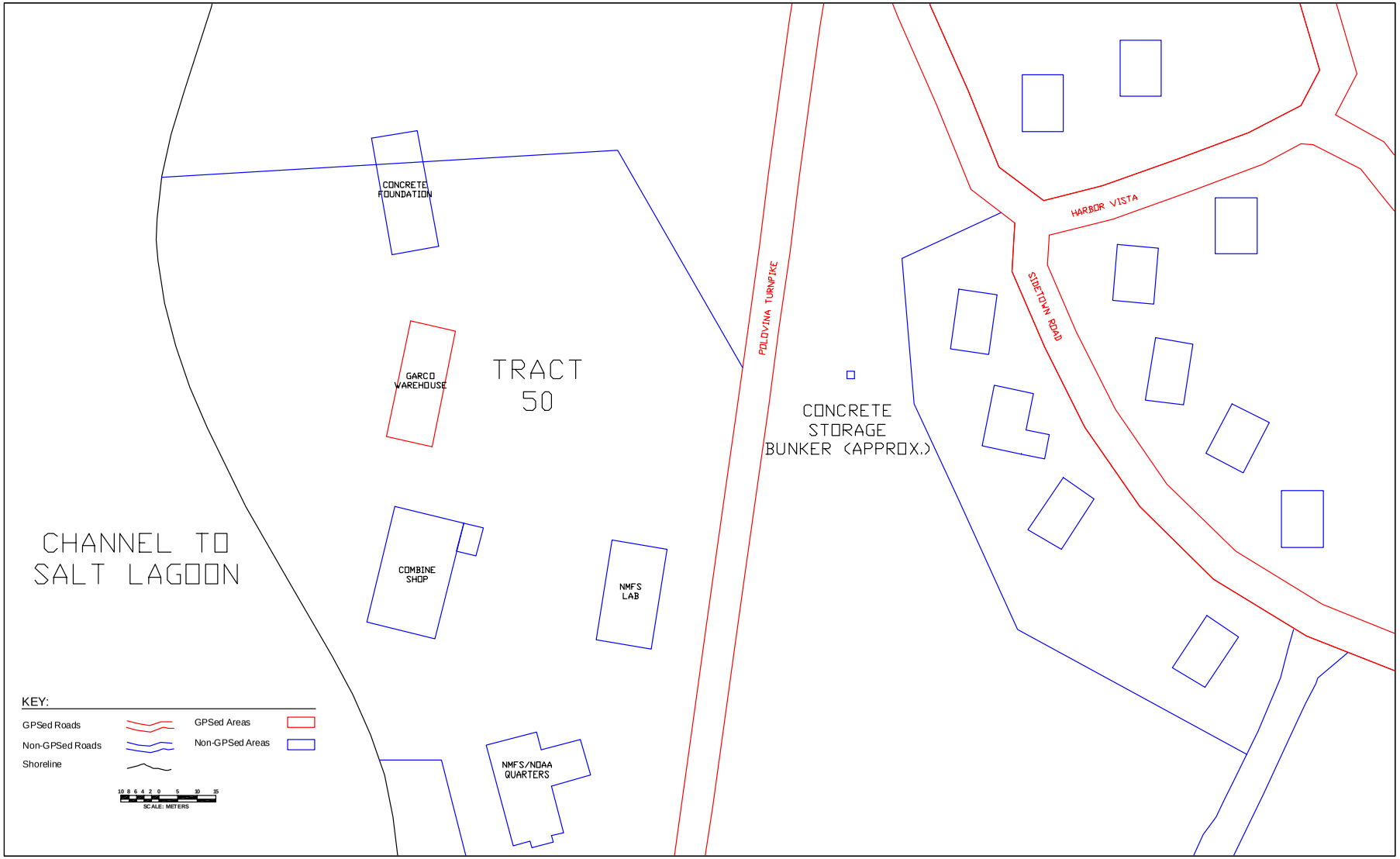
- The site's soils are expected to be uncontaminated and within ADEC cleanup standards because no signs or evidence of any petroleum hydrocarbon contamination was observed during the bunker cleanout operation.
- Groundwater contamination is considered to be very unlikely at this explosives removal site, given the lack of any evidence of any spills, leaks, or other petroleum hydrocarbon releases at the site.

Based on these conclusions, ***NORTECH*** recommends the following:

- No Further Action at this explosives removal site.

APPENDIX 1: Figures & GPS Information





NORTECH

ENVIRONMENTAL & ENGINEERING CONSULTANTS
2400 College Road, Fairbanks, Alaska 99709
(907) 452-5688 FAX: (907) 452-5694

CONCRETE STORAGE BUNKER – EXPLOSIVES DISCOVERY & DEMOLITION
PRIBILOF ISLAND RESTORATION PROJECT
ST. PAUL ISLAND, ALASKA

DATE:	3-27-01	SCALE:	SEE SCALE BAR
PROJ MGR:	CRM	PROJECT:	20108
DRAWN:	TLW	DWG. NO.:	20108BNK-2

FIGURE 2

APPENDIX 2: Site Photographs

Photo 1: C33500G0.JPG Army Ordinance Demolition Team, NOAA, and ***NORTECH*** open up bunker.

Photo 2: C33504G0.JPG Blasting caps and labeled, wooden storage box within concrete bunker.

Photo 3: C33509G0.JPG Army explosives team members evaluating and counting blasting caps.

Photo 4: C33511G0.JPG View of blasting cap bundles at site before transport and demolition/disposal.

STATE OF ALASKA

TONY KNOWLES, GOVERNOR
555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269-7552
Fax: (907) 269-7649
http://www.state.ak.us/dec/

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

April 13, 2001

RECEIVED
APR 23 2001

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way, NE BIN C15700
Seattle, Washington 98115-0070

RE: Draft Site Closure Report Concrete Storage Bunker-Explosives Discovery & Demolition Non-Two Party Agreement (TPA) Site Pribilof Islands Site Restoration Project St. Paul Island, AK March 27, 2001

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (DEC) has received the above document on April 2, 2001. Based on a review of the data presented in the report, ADEC concurs with the Section 7.0 "Conclusions and Recommendations" that no further action is required at the Concrete Storage Bunker (a non-TPA site). ADEC reserves its rights, under 18 AAC 75 Oil and Other Hazardous Substances Pollution Control regulations and AS 46.03 to require NOAA to conduct additional assessment and/or corrective actions, if information indicates the site conditions pose an unacceptable risk to human health, safety, or welfare, or to the environment.

If you have any questions regarding this letter, please call me at (907) 269-7552.

Sincerely,

Louis Howard
Project Manager

cc: Jennifer Roberts, ADEC Anchorage
Breck Tostevin, AGO
Pribilof RAB Members

2001 Concrete Storage bunker clsre rpt.doc NOAA-St. Paul Non-TPA site Concrete Storage Bunker

NOAA Site 43
NTPA: Barrels at North End of Salt Lagoon

Site Closure Report - Draft, Salt Lagoon Drum Removal Site, (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska.....1023

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report Salt Lagoon Drum Removal NON-TPA Site, St. Paul Island November 2001. Dated January 2, 2002.....1037

SITE CLOSURE REPORT - DRAFT

Salt Lagoon Drum Removal Site
(Non Two-Party Agreement Site)

Pribilof Islands Site Restoration
St. Paul Island, Alaska

November 29, 2001

Prepared For:
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office

Prepared By:

ENVIRONMENTAL & ENGINEERING CONSULTANTS
Fairbanks, Alaska

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY 1025
2.0 INTRODUCTION 1025
2.1 Objectives 1025
2.2 Methodology and Applicable Regulations 1025
3.0 SITE BACKGROUND 1026
3.1 Island Historical Information 1026
3.2 Island Environmental Setting 1026
3.2.1 Climate 1026
3.2.2 Geology and Soil 1027
3.2.3 Surface Water and Groundwater 1027
3.3 Site Description 1027
3.3.1 Geology and Soil 1027
3.3.2 Surface Water and Groundwater 1027
3.4 Previous Investigations And Other Activities 1028
4.0 FIELDWORK ACTIVITIES 1028
4.1 Debris Removal 1028
4.2 Soil and Groundwater Sampling 1029
5.0 DEBRIS DISPOSAL & RECYCLING 1032
6.0 DISCUSSION 1032
7.0 CONCLUSIONS AND RECOMMENDATIONS 1032

APPENDICES

Appendix 1: Figures & GPS Information
Appendix 2: Site Photographs
Appendix 3: Daily Reports (and Scrap Recycle Receipt)
Appendix 4: Laboratory Analytical Reports
Appendix 5: Site Video Documentation

1.0 EXECUTIVE SUMMARY

NORTECH Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to the north shore of the Salt Lagoon at St. Paul Island, Alaska, and administered a program of drum and debris removal beginning on April 22, 2000. A long-wrecked fuel barge (Barge "A"), nearby wooden/plastic debris, steel fishing floats, and 2+ scattered, rusted drums were removed from the site and hauled away for disposal and recycling off-island. A small quantity (<1 CY) of suspected-contaminated soils from a limited soil removal program under the "footprint" of one drum were transported and deposited at the Blubber Dump PCS stockpile for thermal remediation. Based on a review and analysis of available project photographs, Daily Reports, and limited field observations, ***NORTECH*** has arrived at the following environmental conclusions:

- The small quantity of soils disturbed by ***NORTECH*** at the Salt Lagoon drum and debris removal site, and the soils still beneath the former locations of drums washed ashore in this area are unlikely to be contaminated by petroleum hydrocarbons at a level greater than the applicable ADEC soil cleanup standards.
- Groundwater contamination is considered unlikely at this debris removal site, given the lack of any evidence of the presence of any significant spills, leaks, or other petroleum hydrocarbon releases at this site.

Based on these conclusions, ***NORTECH*** recommends the following:

- No-Further-Action for this Non-TPA drum and debris removal site.

2.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration, is responsible for site restoration activities at the St. Paul and St. George Islands, Alaska. Collectively, these islands are part of a five island archipelago known as the Pribilof Islands. Petroleum contamination has been identified or potentially may exist at a number of properties currently and formerly owned and operated by NOAA. Affected properties are described in a two party agreement (TPA) between NOAA and the Alaska Department of Environmental Conservation (ADEC) dated January 26, 1996 (NOAA 1996). Under State of Alaska environmental regulations and in accordance with the TPA, NOAA has undertaken an array of site characterization and restoration activities on St. Paul and St. George Islands. Additional work must be conducted to satisfy the TPA, including limited site characterization, remediation, confirmation sampling, and site restoration (NOAA 1996).

Under Contract No. 52ABNA500049, Task Order 56ABNA703706, ***NORTECH*** Environmental and Engineering Consultants (***NORTECH***) has prepared this Debris Removal Report for the Salt Lagoon Drum Removal Site, a non-TPA site, to report on the debris removal and environmental screening/sampling activities which occurred there during the 2000 fieldwork season.

2.1 Objectives

The overall objective for the St. Paul Debris Removal project undertaken by ***NORTECH*** was to develop a written plan of action, have it approved by NOAA and ADEC, and execute it for each TPA and non-TPA site. At each removal area we were to accomplish the acts necessary to gain a no-further-action designation from ADEC, or else gain an understanding of the corrective action efforts that could eventually lead to proper site closure.

2.2 Methodology and Applicable Regulations

In order to meet the project objective, ***NORTECH*** developed a draft Corrective Action Plan and an array of Sampling & Analysis Plans (SAPs) in March 2000 for eleven designated St. Paul debris sites. They were reviewed and approved by NOAA and ADEC, fieldwork was begun in mid-April, and essentially completed in late November 2000. The fieldwork was performed in accordance with the Corrective Action Plan, the site's SAP, and the 1996 Two Party Agreement (TPA) between ADEC and NOAA including the following 1991 versions of ADEC's

regulations and associated guidance documents, as referenced in the TPA, particularly sections 21 to 28, 59, and 103 which call for the application of:

- 18 Alaska Administrative Code (AAC) 70 Water Quality Standards
- 18 AAC 75 Oil and Hazardous Substances Pollution Control
- Underground Storage Tank Procedures Manual, Guidance for Treatment of Petroleum Contaminated Soil and Water and Standard Sampling Procedures

3.0 SITE BACKGROUND

This section provides a brief discussion of the location and history of the Pribilof Islands, weather and environmental conditions on St. Paul Island, a site description, and a statement regarding the fact that we are not aware of any previous investigations at this specific St. Paul debris removal site.

3.1 Island Historical Information

Russia first discovered the Pribilof Islands and their seal rookeries in 1786. In the 1820s, Russia established a settlement on St. Paul Island to support fur seal harvesting. The United States acquired the Pribilof Islands in 1867, when Alaska was purchased from Russia. In 1869, the United States made the Pribilof Islands a federal reservation. From 1869 to 1909, the United States contracted fur seal harvesting and pelt processing to private companies. From 1910 to 1979, the federal government was the sole operator and administrator of the Pribilof Islands. In 1971, the Alaska Native Claims Settlement Act passed, which provided for the transfer of property and management of the islands to Alaskan Native regional and village corporations.

The only major landowners on St. Paul Island are the Tanadgusix Corporation (TDX) and the federal government. The federal government currently retains title to about 1,515 acres on St. Paul Island, which consist of seal rookeries managed by the National Marine Fisheries Service, a U.S. Coast Guard (USCG) LORAN station, two scoria pits, a portion of the current Landfill, and a National Weather Service station. The island's airport, which consists of about 67 acres of land, was conveyed to the State of Alaska in 1989.

3.2 Island Environmental Setting

St. Paul Island is located between latitude 57° 06' and 57° 15' North and longitude 170° 05' and 170° 25' West. It is surrounded by the Bering Sea, and is about 800 miles west southwest of Anchorage and 300 miles north northwest of Dutch Harbor, Alaska. The island is about 44 square miles in area (Figure 1). About 27 centerline miles of road bisect the island north south and east west. The City of St. Paul is located on the southern peninsula of the island; its 1998 population included 761 people (ADL 1999). St. Paul Island has many sand dunes and is vegetated with grasses and small forbes over the majority of its area. The vegetation is broadly classified as moist tundra. Some common plant species present on the island include blue lupine, arctic poppy, beach wild rye, and sea beach sandwort.

St. Paul Island serves as a nesting area for a great number of seabirds and a rookery area for fur seals. Commercial crab harvesting areas are located within 15 miles of the island. Major harvest species are the Tanner crab and Korean Hair crab.

3.2.1 Climate

The climate of the island is classified as subpolar. Maritime weather conditions prevail on the island, with predominantly cloudy, foggy, and windy conditions. Total annual precipitation averages 23.3 inches, with most occurring between the months of April and October. The mean monthly temperature ranges from 22.4°F in winter to 47.8°F in summer, with a mean annual temperature of 34.8°F. Wind speeds range from 12.2 to 20.6 miles per hour, with an average of 17.2 miles per hour (NCDC 1999).

3.2.2 Geology and Soil

St. Paul Island is composed of basaltic lava flows and sills overlain by a thin veneer of tuffaceous and scoriaceous material, glacial sediment, and sandy material that has formed dunes on the eastern portion of the island. A number of cinder cones rise to a maximum elevation of 665 feet. The cones are moderately steep sided, with several having craters at their summits. A gently rolling topography, averaging 200 feet in elevation, occurs between the cones.

The shoreline along the Bering Sea ranges from rocky sea cliffs and headlands to short, steep beaches and is generally composed of cobbles, gravel, and sand. The shoreline of the western portion of the island is generally rocky sea cliffs and headlands, with beach shoreline and back dunes present in other portions.

3.2.3 Surface Water and Groundwater

Many lakes are located on St. Paul Island, but no streams are known to exist. The largest lake, Big Lake, is located on the northeastern part of the island. Sheep Lake is located west of Big Lake. Other smaller lakes are located in the southern portion of the island. The lakes with direct estuarine connection to the Bering Sea (for example, the Salt Lagoon) tend to be brackish; the remaining lakes are freshwater. Much of the surface of the island is composed of sandy or scoriaceous material that allows for rapid infiltration of water.

The City of St. Paul obtains its municipal water supply from four wells located about 1.5 miles north-northeast of the city and immediately east of Telegraph Hill (Fredreka I, Fredreka II, south well, and north well). A fifth well serves the USCG station. These wells are reportedly completed within the basalt aquifer. The four municipal wells are connected by pipelines that supply three 200,000 gallon water storage tanks located on a hill above the city.

3.3 Site Description

The Salt Lagoon Drum Removal Site involves a small scattering of badly rusted 55-gallon steel drums, some of which were presumably placed at this site by the severe storm that forced a Bureau of Commercial Fisheries fuel barge (Barge "A") ashore at the same general location. (Figure 1, Appendix 1) Barge "A" has reportedly been in its current storm-tossed location, visible from downtown St. Paul, for about 35 to 40 years. (Photo 1, Appendix 2: Site Photographs) Barge "A"s retrieval/disposal and the debris removal efforts that ***NORTECH*** and BSE performed associated with that wreck are listed under a separate Pribilof 2000 cleanup report also prepared recently by ***NORTECH*** and entitled NMFS Fuel Barges "A", "B", "C", "D" Site Closure Report (TPA 7).

At least (16) separate steel drums were discovered and retrieved during summer 2000 from this drum/debris site (Photo 2), some of which had been lifted or thrown as much as 125 feet inland by succeeding decades of waves and storms, and others were spread along almost 1,000 feet of the northern shoreline of the Salt Lagoon. This shoreline site is approximately 0.3 miles southeast of the Blubber Dump, and 1.4 miles north of the City center. The Salt Lagoon is a northerly brackish extension of Village Cove, attached by a slender channel to the northern side of the St. Paul Harbor.

3.3.1 Geology and Soil

The site is located on a sandy, tide-affected beach environment. Inland of the sandy beachline, the area is thickly vegetated with salt-resistant grasses and small forbes typical of the Island. The thickness of the sand and the depth to bedrock are not known.

3.3.2 Surface Water and Groundwater

The nearest surface water body to this cleanup site is the adjacent Salt Lagoon, which is fed by a narrow channel leading to the St. Paul Harbor and Village Cove, near the southern end of St. Paul Island. In addition, the Bering Sea is approximately 0.5 miles west of the site. No freshwater bodies are located at or near this debris removal site. The depth to groundwater at the site was observed during the removal of Barge "A" to be at the same level as the water surface of the adjacent Salt Lagoon, which would imply a depth ranging from 3 to 7 feet below ground surface at the various drum retrieval sites (see Section 4.2).

3.4 Previous Investigations And Other Activities

A limited drum and debris removal program accomplished in October 1999 was reported by Tetra Tech EM, Inc. in their Technical Memorandum dated December 26, 2000, and entitled Debris Removal, Salt Lagoon Debris Site, St. Paul Island, Alaska. Tetra Tech was responding to the earlier discovery and geographic positioning system (GPS) location by NOAA in June 1998 of (27) highly corroded steel 55-gallon drums, as well as (20) large steel fishing floats (2' diameter), and several large assemblages of miscellaneous wooden debris cast up on the Salt Lagoon shore.

Tetra Tech, in 1999, removed a total of (21) drums and (15) steel floats from the Salt Lagoon debris site, but could not find the remainder of the NOAA-reported drums and floats because of dense and obscuring waist-high grasses. They collected and removed what little fluids remained in the drums being retrieved – totaling only about 35 gallons of liquids – and noted that the soils underlying drums at a few locations (particularly Drum 9 and Drum 15) appeared to have been impacted at some time in the past by contents leaking from those drums. After each drum was removed, Tetra Tech collected a soil sample from a depth of from 0 to 6 inches below ground surface and field-screened the soil with an isobutylene-calibrated photoionization detector (PID). The PID results gathered ranged from meter values of 5.1 to 307, with the highest reading observed at Drum 15 which had contained suspected diesel fuel. Only four of the drum sites had headspace PID readings in excess of 100 (Drums 12, 15, 16, and 20). The reported headspace PID readings for most of the drum sites ranged from 20 to 70, which was noted in the Tetra Tech report to be representative of background soil samples due to moisture interference with the PID lamp that day. Further soil sampling and analytical effort was suggested if NOAA was subsequently determined to be responsible for the drums and any associated soil contamination.

NORTECH does not know of any other previous environmental reports involving the Salt Lagoon Drum Removal Site.

4.0 FIELDWORK ACTIVITIES

4.1 Debris Removal

On April 22, 2000, ***NORTECH*** mobilized several BSE workmen and suitable heavy equipment to the northern shoreline of the Salt Lagoon to perform some winter-season debris removal by using a snow-covered access path across frozen, grassy terrain. (Photo 1) The work crew chopped up and removed the remnants of the wreck known as Barge "A", as well as some associated/nearby driftwood and flotsam debris along the shore, (2) 55-gallon rusted steel drums and large steel floats (Photos 2 & 4, and Appendix 3: Daily Reports).

During the Barge "A" debris operation, the various drum locations, where the array of rusted drums were either again visible or else had already been removed by Tetra Tech, were recorded as GPS waypoints and flagged for later contamination fieldscreening and characterization. (Photos 4 & 6) Most of the drum locations flagged in 1999 during the previous limited removal action by Tetra Tech described above were also re-located and "re-tagged" as Summer 2000 GPS waypoints. After Barge "A" was cutup and wholly removed, several additional front-end loader bucket-loads of miscellaneous driftwood and large wooden debris, plywood, steel fishing floats, and general rubbish was also removed from the beachline of the Salt Lagoon on April 24, 2000. (Photos 4, 6, and 7)

During these drum and debris removal operations, a constant watch was kept to assure that there were no remaining fluids in the drums. Suspected-contaminated soils within and immediately adjacent to the Barge were drummed and removed from the area for later characterization and eventual thermal remediation in the Blubber Dump petroleum contaminated soils (PCS) stockpile.

On September 6, 2000, ***NORTECH*** and BSE personnel returned to the Salt Lagoon to sample and field screen each of the drum retrieval locations, and these efforts are more fully described in Section 4.2 below. In general, the drums associated with this site at the head of the Salt Lagoon were significantly weathered (Photos 3 & 5) and most were probably empty when washed into their final resting places. Careful examination of the drum imprints

left in the terrain and vegetation did not usually suggest soil staining during the removal efforts at this site, and there was no other evidence leading us to believe that the soils at the site had been contaminated with petroleum hydrocarbons or other contaminants.

4.2 Soil and Groundwater Sampling

No groundwater sampling was performed at this site, since groundwater was not exposed by the surficial drum removal work performed, and it is not suspected to have been contaminated given the analytical results reported below.

The sandy soils lying directly beneath the former Barge "A" footprint were sampled on April 27, 2000, and those sample results have been fully reported and included as part of the NMFS Fuel Barges "A", "B", "C", "D" Site Closure Report. In brief, the soil clearance sample collected, SPN 20427-005-S was found to be free of any indication that petroleum hydrocarbon contamination had leaked from the Barge into the adjacent or underlying soils. (Photo 8)

On September 6, 2000 and again on September 7, 2000, ***NORTECH*** personnel returned to the Salt Lagoon site to field-screen the soils beneath the drum imprints with a PhotoVac MicroTip HL-2000 Photo-Ionization Detector (PID) with a 10.6 EV lamp calibrated to 100-ppm isobutylene. Of the 26 drum removal sites "found" and screened by PID, the seven highest PID value locations were further screened by also using a Hanby Extraction Leaching Process Kit (Hanby analysis). The PID and Hanby observations for all of the Salt Lagoon drum locations are listed in Table 1. Positive analytical results derived while using the Hanby Kit were re-confirmed by doing dilutions and reanalysis.

Similarly, Hanby Kit samples that were viewed as ambiguous were re-assayed using twice the normal soil extraction weight. Of the seven drum locations field-screened and then further examined, only the Drum 15 removal site result suggested the presence of any substantial petroleum hydrocarbon contamination. Confirmation soil samples were obtained on September 8, 2000 from the soils beneath Drums 6 and 20 (SNPBA908-001-S and SNPBA908-002-S respectively), and submitted to CT&E in Anchorage immediately.

NORTECH and two BSE personnel returned to the Drum 15 site on September 15, 2000 to sample and analyze those soils. Using hand tools, an excavation extending approximately 24 ft2 on the surface, and no greater than 3 feet deep, was made at the former drum footprint. Excavated soils were transported within small bins by 4-wheeler ATV to the nearest road and containerized in two 85-gallon overpack drums. Following confirmation sampling and laboratory analyses by CT&E, these excavated soils were transported to the Blubber Dump PCS stockpile for thermal remediation.

Groundwater was exposed at the very bottom of an exploratory test hole (within the excavation shown on Figure 3) at approximately 3.5 feet depth and promptly backfilled. Following screening by PID, soil samples were collected from the excavated pit bottom at 3 feet depth, and also from the downgradient (southern) pit wall at 1.5 feet depth (PID meter values were 47.2 and 68.7 respectively). Soil sample SNPBAD15915-010-S was selected to be the soil obtained from the pit wall since that was the higher PID value.

On October 1, 2000, ***NORTECH*** and BSE returned to the Salt Lagoon's Drum 15 site. ***NORTECH*** directed two BSE personnel as they conducted a grid of soil borings using a hand-operated posthole digger. Borings were installed at 2.5', 5' and 10' downgradient (See borings A to I on Figure 3) from the Drum 15 excavation, and laterally (cross-gradient) at 4' and 8' from the 5' downgradient boring. One control boring 25' upgradient from the Drum 15 excavation was also installed. Representative soils from 1', 2' and 3' depths within these hand-augered borings were individually screened by PID. A total of seven downgradient and one upgradient borings were therefore completed.

Soil sample SNPBA110-007-S and duplicate sample SNPBA110-008-S were obtained from the single soil sample whose field-screening (PID meter value was 22.1) suggested the potential for hydrocarbon contamination. The soils submitted for laboratory analysis were collected at the boring installed approximately 10 feet downgradient from the Drum 15 excavation, and were collected from a soil layer about one foot below the heavily vegetated surface layer. The results of these laboratory analyses are reported below in Table 2.

Table 1. PID and Hanby Kit Field Screening Results: September 6, 2000

Sample Location	PID value	Hanby (ppm)	Laboratory Sample ID
Drum 1	5.3		
Drum 2	7.2	0	
Drum 3	3.1		
Drum 4	4.6		
Drum 5	5.8		
Drum 6	6.8	0	SNPBA908-001-S
Drum 7	4.9		
Drum 8	2.8		
Drum 9	2.8		
Drum 10	1.2		
Drum 11	2.1		
Drum 12	0.2		
Drum 13	1.4		
Drum 14	0.4		
Drum 15	83	1000 (DRO)	SNPBA110-007-S SNPBA110-008-S(dup)
Drum 16	0.0		
Drum 17	0.3		
Drum 18	0.5		
Drum 19	12.4	0	
Drum 20	5.2		SNPBA908-002-S
Drum 21	7.8		
Drum 22	8	0	
Drum 23	9.1	0	
Drum 24	1.8		
Drum 25	2.4		
Drum 26	2.7		

Table 2. Site Characterization and Clearance Sampling

		Soils Beneath Drum 6		Soils Beneath Drum 20		Drum 15 South Pit Wall (1.5 ft. Depth)		Drum 15 Boring C (1.0 ft. Depth)		Drum 15, Boring C Duplicate Sample	
Analyses	**ADEC Regulatory Cleanup Level (18 AAC 75.341)**	**SNPBA908-001-S**	**PQL (mg/Kg)**	**SNPBA908-002-S**	**PQL (mg/Kg)**	**SNPBAD15915-010-S**	**PQL (mg/Kg)**	**SNPBA110-007-S**	**PQL (mg/Kg)**	**SNPBA110-008-S (duplicate to -007)**	**PQL (mg/Kg)**
PID value	NA	6.8	NA	5.2	NA	68.7	NA	22.1	NA		
Hanby	NA	0.0	NA	ND	NA	1000 (DRO)	NA	---	---	---	---
RRO (mg/Kg)	2,000	10.4U	10.4	23	18.2	29.5	23.4	17.2U	17.2	17.3U	17.3
DRO (mg/Kg)	1,000	21	17.2	11.1	11.1	60.8	14.2	10.4U	10.4	10.5U	10.5
GRO (mg/Kg)	500	NA	NA	NA	NA	1.63U	1.63	2.73U	2.73	2.41U	2.41
BTEX (mg/Kg)											
-All Analytes-	Varies	NA	NA	NA	NA	**~PQL****	Varies	**~PQL****	Varies	**~PQL****	Varies
PAHs (mg/Kg)											
-All Analytes-	Varies	**~PQL****	Varies	**~PQL****	Varies	**~PQL****	Varies	**~PQL****	Varies	**~PQL****	Varies
Metals: (mg/Kg)											
Arsenic	2	**2.36**	0.437	**3.41**	0.551	**2.29**	0.377	**2.3**	0.418	**2.42**	0.408
Barium	1,100	24.2	0.914	27.8	1.1	23	0.755	21.4	0.836	21.6	0.816
Cadmium	5	0.0457U	0.0457	.0551U	0.0551	0.0377U	0.0377	0.0418U	0.0418	0.0408U	0.0408
Chromium	26	**69.4**	0.914	**63.5**	1.1	**42.7**	0.755	**57.6**	0.836	**52.1**	0.816
Lead	1,000	5.71U	5.71	6.89U	6.89	4.72U	4.72	5.23U	5.23	5.1U	5.1
Selenium	3.5	0.457U	0.457	0.551U	0.551	0.377U	0.377	0.418U	0.418	0.408U	0.408
Silver	21	0.183U	0.183	0.220U	0.22	0.151U	0.151	0.167U	0.167	0.163U	0.163
Mercury	1.4	0.208U	0.208	0.0198U	0.0198	0.0203U	0.0203	0.0181U	0.0181	0.0207U	0.0207

Note:
U Indicates the analyte was not detected above the practical quantitation limit cited.
NA Indicates the parameter is not applicable.
No SCL No Allowable Site Cleanup Level has been set by ADEC at this time.
~PQL** There were no significant variations from PQL; see Appendix 4 for copies of samples' full analytical results.
Bolded numbers indicate the contaminant concentration is above the established regulatory cleanup limit.

ADEC's Regulatory limits were taken from Tables A1 & B1, Under 40-inches Category, "Migration to Groundwater Pathway" in ADEC's regulataions, 18 AAC 75, dated October 1999.

5.0 DEBRIS DISPOSAL & RECYCLING

The steel drums removed from the head of the Salt Lagoon, and the array of metal debris removed from the Barge "A" (TPA 7) site, was all temporarily placed (staged) at the NMFS Staff compound, as part of a large pile of metal debris behind the Garco warehouse and Combine Building, just off the Polovina Turnpike, near the Post Office. This metal debris was later reloaded and hauled in mid-September 2000 to a large walled barge at the St. Paul dock, which sailed to Seattle and was unloaded at the Seattle Iron & Metals yard on the Duwamish River at the end of September 2000. The miscellaneous steel, copper, and aluminum items were unloaded, processed and recycled by the salvage yard.

The miscellaneous wood and burnable trash removed from the Salt Lagoon site was all disposed of on-island. The wood items were temporarily stored at the NMFS Compound, and then transported and burned at the Landfill, as part of a series of large wooden debris burns coordinated with the City of St. Paul.

6.0 DISCUSSION

NORTECH has completed the removal of all visible solid wastes in the vicinity of the wrecked Barge "A". A wide array of wooden debris was cleared from the area and burned at the Landfill, and then 2+ rusted steel drums found and removed from the north shore of the Salt Lagoon were transported off-island and recycled for their steel content.

PID and Hanby Kit field-screening of the suspect soils beneath the former drum "footprints" suggested that only one of the 26 drum locations found and evaluated had much likelihood of being potentially contaminated with petroleum hydrocarbons. Confirmation soil samples of the most-suspect drum site, Drum 15, were collected and analyzed following a limited soils removal program (< 1 cubic yard (CY) drummed up and removed for future remediation).

Respecting all other barrel and debris sites, none of the sampling efforts, either field screening or laboratory analytical work, yielded data which caused ***NORTECH*** to believe that the soils or groundwater at the Salt Lagoon Drum and Debris site was contaminated at levels above the allowable ADEC soil cleanup standards, except for the chromium and arsenic values which were from 42.7 to 69.4 mg/Kg and 2.29 to 3.41 mg/Kg, respectively (Table 2). These chromium and arsenic concentrations exceed the applicable ADEC cleanup standards in the soils beneath the Salt Lagoon drums, but are within the range of "background" As and Cd levels for St. Paul's volcanic scoria and sandy soils. (Tetra Tech EM Inc., Soil Background Study, Pribilof Islands Site Restoration, St. Paul Island, AK. December 29, 2000).

The cleanup objectives outlined in the Corrective Action Plan for the Pribilof Islands Site Restoration Project and in Section 2.1 above were met. Care was taken to avoid spills from the drums and miscellaneous extracted debris and no other evidence was discovered indicating the presence or a suspicion of contaminated soils.

7.0 CONCLUSIONS AND RECOMMENDATIONS

NORTECH Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to the north shore of the Salt Lagoon at St. Paul Island, Alaska, and administered a program of drum and debris removal beginning on April 22, 2000. A long-wrecked Bureau of Commercial Fisheries fuel barge (Barge "A"), nearby wooden/plastic debris, steel fishing floats, and 2+ scattered, rusted drums were removed from the site and hauled away for disposal and recycling off-island. A small quantity (<1 cubic yard (CY) was of suspected-contaminated soils from a limited soil removal program under the "footprint" of one drum were transported and deposited at the Blubber Dump PCS stockpile for thermal remediation. Based on a review and analysis of available project photographs, Daily Reports, and limited field observations, ***NORTECH*** has arrived at the following environmental conclusions:

- The small quantity of soils disturbed by ***NORTECH*** at the Salt Lagoon drum and debris removal site, and the soils still beneath the former locations of drums washed ashore in this area are unlikely to be contaminated by petroleum hydrocarbons at a level greater than the applicable ADEC soil cleanup standards.
- Chromium and arsenic levels in soils are within the range of background levels.
- Groundwater contamination is considered unlikely at this debris removal site, given the lack of any evidence of the presence any significant spills, leaks, or other petroleum hydrocarbon releases at this site.

Based on these conclusions, ***NORTECH*** recommends the following:

- No-Further-Action for this Non-TPA drum and debris removal site.

APPENDIX 2: Site Photographs

Photo 1: A07543D0.jpg: Wrecked Barge “A” on the north shore of the Salt Lagoon. (April 22, 2000)

Photo 2: A07591D0.jpg: View to the west along north shore of the Salt Lagoon during Barge “A” removal. One of the drums found can be seen in the grass at edge of snow, at the left side of this photo.

Photo 3: A07592D0.jpg: Salt Lagoon drum, partially submerged and obscured in grasses and snow.

Photo 4: A07595D0.jpg: General cleanup of shoreline miscellaneous debris during Barge "A" removal efforts. Note ***NORTECH*** employee recording GPS location data on a discovered drum. (April 24, 2000)

Photo 5: A07596D0.jpg: Typical rusted and battered condition of the steel drums found at Salt Lagoon.

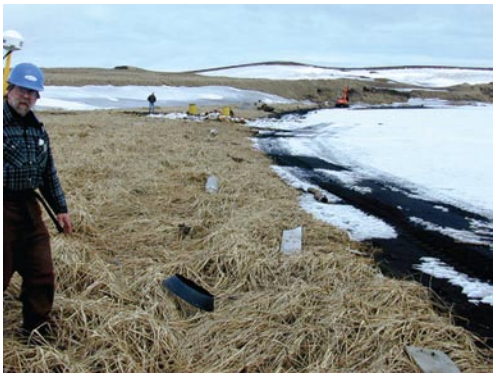


Photo 6: A07597D0.jpg View to the east along the north shore of the Salt Lagoon. Note overpack drums available to receive any suspect contaminated soils discovered during barge removal.

Photo 7: A07605D0.jpg: Another eastward-looking view along the north shore of the Salt Lagoon after the removal of Barge “A” and other beach debris was fully completed. (April 24, 2000)

Photo 8: A07607D0.jpg: ***NORTECH*** obtaining laboratory samples of soils formerly beneath Barge “A”. (Similar process later applied to sample soils at augered borings by Drum 15)

STATE OF ALASKA

TONY KNOWLES, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269-7552
Fax: (907) 269-7649
http://www.state.ak.us/dec/

January 2, 2002

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-0070

RE: Draft Site Closure Report Salt Lagoon Drum Removal NON-TPA Site St. Paul Island November 2001

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (ADEC) has received the above document on December 6, 2001. Below are ADEC's comments.

3.4 Previous Investigations and Other Activities Page 5

The text states NOAA's contractor does not know of any other previous environmental reports involving the Salt Lagoon Drum Removal Site. The ADEC wishes to inform the contractor that there are numerous previous investigations, studies, and documents produced by various agencies involving the Salt Lagoon. Here is a listing (not meant to be all inclusive) of documents that the ADEC is aware of:

- Corps Of Engineers Environmental Assessment St. Paul Harbor February 1988
- Corps Of Engineers Site Investigation Salt Lagoon Diesel Seep November 1989
- Corps Of Engineers State of Work Site Investigation Salt Lagoon Diesel Seep August 14, 1989
- NMFS St. Paul Island Salt Lagoon Diesel Seep Memorandum July 7, 1989 and companion document Engineer Site Visit June 20-22 1989-Report On National Marine Fisheries Service St. Paul Island Salt Lagoon Diesel Seep
- Corps of Engineers Final Site Investigation for Salt Lagoon Diesel Seep February 28, 1990
- NOAA Proposed Remediation for Salt Lagoon Diesel Seep June 25, 1991
- Work Plan for Remediation of Contaminated Ground Near Salt Lagoon January 13, 1992

- NOAA Oil Spill Consultants Final Report Diesel Fuel Spill Remediation June 29, 1992

- NOAA E & E Inc./Corps of Engineers Preliminary Assessment of NOAAA Sites Pribilof Islands February 1993
- Corps of Engineers Environmental Assessment/Finding of No Significant Impact April 1998 for dredging project involving portions of the Salt Lagoon
- Corps of Engineers Woodward Clyde Consultants Draft Corrective Action Plan for Salt Lagoon Diesel Seep Site June 1994
- NOAA Oil Spill Consultants Work Plan for Hazardous and Toxic Waste Removal and Disposal August 15, 1994
- Corps of Engineers Site Inspection Report St. Paul Island September 1994
- USDOI BLM St. Paul Island Land Conveyance letter dated August 16, 1994-which shows Diesel Seep Salt Lagoon land and "Seal By-Products Processing Plant" in Lot 1, T. 35 S., R. 132 W. Seward Meridian occurred on January 19, 1979 and Patents in 1990
- Corps of Engineers Woodward Clyde Consultants Technical Scope of Work Contaminated Soil Excavation and Stockpiling Salt Lagoon Diesel Seep August 1994
- NOAA Oil Spill Consultants Work Plan for Petroleum Contaminated Soil Excavation and Stockpiling St. Paul Island October 1, 1994
- USEPA Fed. Facilities Site Assessment manager letter to NOAA regarding the Site Inspection conducted for NMFS property on St. Paul Island stating No Further Action is required under the CERCLA Program
- NOAA Oil Spill Consultants Final Report for Contaminated Soil Excavation and Stockpiling April 6, 1995
- NOAA Draft Site Characterization Plan Diesel Seep Site July 2000

There may be more documents and reports concerning the Diesel Seep Salt Lagoon area on St. Paul Island that ADEC is not aware of which NOAA has in its possession in either draft or final form. Based on a review of the data presented in the report, the ADEC concurs that the drum removal action was successful and no additional remedial action is required for the drum removal at the NON-TPA site *Salt Lagoon Drum Removal Site.* This determination is only for the *Salt Lagoon Drum Removal Site* and it does not apply to any other site mentioned in the document (especially TPA Site No. 13-1 Salt Lagoon Diesel Seep).

However, if in the future, additional contamination or unacceptable risks to human health or the environment are discovered at this site, further investigation and/or remedial actions will be requested of NOAA by the ADEC. The ADEC reserves its rights, under 18 AAC 75 Oil and Other Hazardous Substances Pollution Control regulations and AS 46.03 to require NOAA to conduct additional assessment and/or corrective actions, if information indicates the site conditions pose an unacceptable risk to human health, safety, or welfare, or to the environment.

If you have any questions regarding this letter, please don't hesitate to call me at (907) 269-7552.

Sincerely,

Louis Howard
Project Manager

cc: Jennifer Roberts, DEC Anchorage
Pribilof Islands RAB Members

lhoward\2002\NON TPA Salt lagoon drums.doc NOAA Non-TPA Salt Lagoon Drums genl corr.

NOAA Site 44
NTPA: Big Polovina Debris

Technical Memorandum Debris Removal Polovina Hill Debris Site,
St. Paul Island, Alaska 1043

Letter from Louis Howard to John Lindsay RE: Draft Technical Memorandum
Debris Removal Polovina Hill Debris Non-TPA Site December 17, 1999.
Dated February 1, 2000.....1051

TECHNICAL MEMORANDUM

DEBRIS REMOVAL
POLOVINA HILL DEBRIS SITE
ST. PAUL ISLAND, ALASKA

DECEMBER 26, 2000

As part of a site characterization, closure confirmation sampling, and debris removal program conducted pursuant to a National Oceanic and Atmospheric Administration (NOAA) statement of work dated September 7, 1999, Tetra Tech EM Inc. (Tetra Tech) was tasked with conducting debris removal activities at various sites on St. Paul Island, Alaska. Twelve of the sites are subject to a two-party agreement (TPA) between NOAA and the Alaska Department of Environmental Conservation (ADEC). NOAA and ADEC identified several other non-TPA sites during the 1999 field season.

The purpose of this technical memorandum is to document debris removal activities conducted during the 1999 field season at the Polovina Hill Debris Site, a non-TPA site. Tetra Tech conducted the debris removal in October 1999.

Background

The Polovina Hill Debris Site is located in the tundra north of Polovina Hill and south of the Vehicle Boneyard (TPA Site No. 2). During the 1999 field season, Tetra Tech conducted a visual reconnaissance of the site and identified various debris items scattered in the tundra, including two wooden cable spools, 10 severely dilapidated steel drums, and a galvanized steel drum containing about 5 gallons of liquid and marked "Property Air Force U.S. Army." It is not known how or when this debris came to be located at the site. In addition, Tetra Tech observed an overturned, partially buried dump truck bed that contained numerous seal bones at the foot of Polovina Hill. Reportedly, the truck was carrying seal carcasses and ran off the Polovina Hill scoria pit access road, overturning at the foot of the hill.

The tundra between Polovina Hill and the Vehicle Boneyard is fairly remote. No structures are located within several miles of the site. A road serving the actively mined Polovina Hill scoria pit abuts the site to the south, and a closed road passing through the Vehicle Boneyard abuts the site to the north. Access to both roads is controlled, but foot access to the site is not. The City of St. Paul operates several municipal wells that are located about 3 miles southwest of the Polovina Hill Debris Site. The nearest major surface water bodies are Big Lake and the Bering Sea, about 1.5 miles north-northeast and east of the site, respectively. Tetra Tech has not identified any clear surface water runoff pathways between the site and either water body.

Debris Removal

In October 1999, Tetra Tech personnel rolled the wooden spools, which were located at the base of Polovina Hill, toward the Vehicle Boneyard access road, where they were loaded into the bed of a pickup truck and transported to the debris staging area established at Tract 38, located on the north face of Polovina Hill. To minimize disturbance to the tundra, individual drums were carried by hand to the base of Polovina Hill, placed into flexible intermediate bulk containers and pulled up the slope by a rope. The rusted drums were added to the Tract 38 debris staging area, and the galvanized drum was transported to the investigation-derived waste management area in the Garco Building, located west of the National Marine Mammals Laboratory parking lot. At this location, about 5 gallons of rusty water were removed from the drum, field screened for hazardous waste characteristics, and bulked with compatible investigative waste. The empty, galvanized drum was returned to the Tract 38 debris staging area. About 500 pounds of metallic debris were removed. Because of their large size, Tetra Tech did not weigh the wooden spools.

With the exception of the completely intact galvanized drum, each of the drums was severely rusted, and all were missing tops or large portions of the barrel itself. In many cases, drum rings held rusty tatters together. Tetra Tech inspected the inside of each drum, noting that they were dry and exhibited no odor or discoloration, other than rust. After removing each drum, Tetra Tech inspected the tundra at each drum location. Tundra vegetation was intact, with no bare soil exposed. It is likely that that the drums were carried or rolled to their locations relatively recently, because the drums were resting on the tundra and not partially buried beneath it.

At each drum location, Tetra Tech observed no indication of staining or stressed vegetation. Attachment 1 contains photographs taken during debris removal activities at the site.

Conclusions and Recommendations

With the exception of the inverted dump truck bed full of seal bones, all surface debris identified during the 1999 field season has been removed from the site. The dump truck bed does not appear to contain fluids or hazardous substances. Based on Tetra Tech's observations, further investigation or corrective action is not justified at the Polovina Hill Debris Site.

ATTACHMENT 1

PHOTOGRAPHS

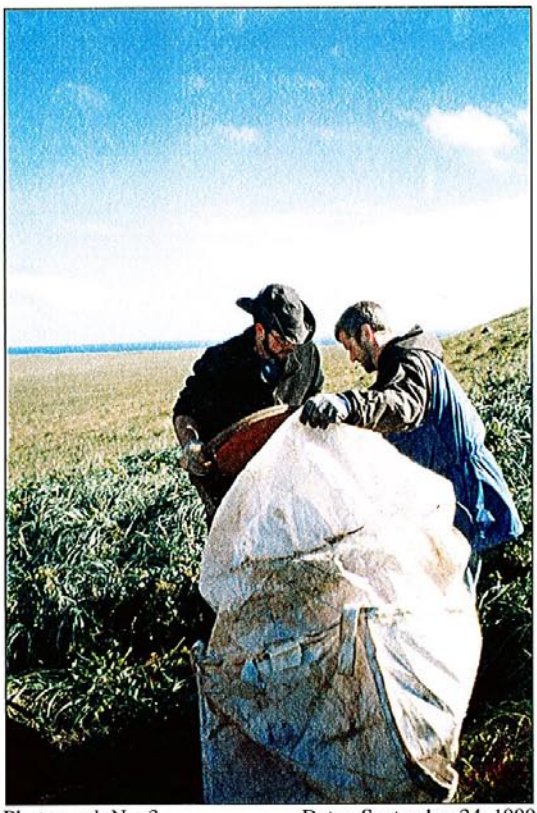
DEBRIS REMOVAL
POLOVINA HILL DEBRIS SITE
ST. PAUL ISLAND, ALASKA

Photograph No. 1 Date: September 24, 1999

This photograph shows the portion of the Polovina Hill Debris Site directly down slope from Polovina Hill. Several drums collected in the tundra area between the Vehicle Boneyard (Two-Party Agreement [TPA] Site No. 2) and Polovina Hill, as viewed from the Polovina Hill scoria pit. Empty, dilapidated drums were collected and consolidated near an inverted dump truck bed containing seal carcasses. The rope that was used to transport debris up slope is visible.

Photograph No. 2 Date: September 24, 1999

This photograph shows some of the collected and consolidated debris at the base of Polovina Hill prior to transport up slope in flexible intermediate bulk containers (FIBC). Dark scoria at the edge of the scoria pit is present in the foreground.



Photograph No. 3 Date: September 24, 1999

Tetra Tech employees placed drums and other debris collected at the Polovina Hill Debris Site into FIBCs and removed them from the tundra by pulling them up the Polovina Hill slope.

Photograph No. 4 Date: September 24, 1999

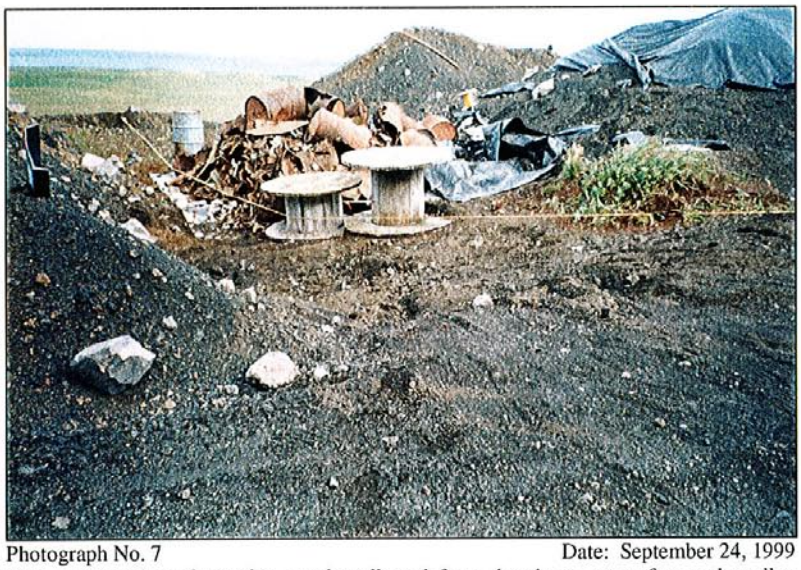
Once inside a FIBC, field personnel attached a rope to the container and used a pickup truck to pull the material up to the debris staging area at the Polovina Hill scoria pit.

Photograph No. 5 Date: September 24, 1999

As viewed from the top of the slope at the Polovina Hill scoria pit, this photograph shows drums being transported up the slope in FIBCs, using a rope attached to the rear of a pickup truck.

Photograph No. 6 Date: September 24, 1999

This photograph shows FIBCs containing drums being pulled up the Polovina Hill slope. Upon reaching the top of the slope, the drums were placed in the debris staging area at the Polovina Hill scoria pit.



Photograph No. 7 Date: September 24, 1999

Field personnel used wooden spools collected from the site as part of a crude pulley system to guide the rope pulling the FIBCs up the slope. The lined debris staging area is behind the spools. The covered soil stockpile on the right side of the photograph is from an unrelated project.

Photograph No. 8 Date: September 24, 1999

This photograph shows the only intact drum recovered from the tundra between TPA Site No. 2 and Polovina Hill. This drum, labeled "Property Air Force U.S. Army" and "ICC-5-14-SS-42," was closed, free of holes and cracks, and contained about 5 gallons of liquid. The drum was transported to a staging area near the St. Paul National Marine Mammals Laboratory (NMML) facility for opening and content characterization.

Photograph No. 9 Date: September 24, 1999

As viewed from the Polovina Hill scoria pit, this photograph shows the site after debris removal activities were complete. The dump truck bed was scheduled for later removal.

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

TONY KNOWLES, GOVERNOR
555 Cordova Street, Second Floor
Anchorage, AK 9950 1-26 17
Phone: (907) 269-7556
Fax: (907) 269-7649
http://www.state.ak.us/dec/

February 1, 2000

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Restoration and Response
7600 Sand Point Way, N.E. Bldg. 4 BIN Cl5700
Seattle, WA 98115-0070

RE: Draft Technical Memorandum Debris Removal Polovina Hill Debris Non-TPA Site December 17, 1999.

Dear Mr. Lindsay:

The Department of Environmental Conservation (DEC) has received the above document on January 4, 2000. Based on a review of the data presented in the document the surface debris appears to have been removed from the site. DEC will not require NOAA to conduct further investigation or remedial action at this time. However, please note that DEC reserves all of its rights under 18 AAC 75 and AS 46 to require NOAA to conduct further investigation and/or remedial action if information indicates the site conditions pose a risk to human health, safety, and welfare, and of the environment.

If you have any questions regarding this letter, please don't hesitate to call me at (907) 269-7552.

Sincerely,

Louis Howard

Louis Howard
Project Manager

cc: Laura Ogar, DEC Anchorage
Jennifer Roberts, DEC Anchorage
Breck Tostevin, AGO
Pribilof Islands RAB Members

lhoward\pol **hill** debris 2000.doc

NOAA St. Paul **pol hill** debris NOAA Genl corr

416

NOAA Site 45
NTPA: SW Point Former LORAN

Final Interim Removal Action Report, St. Paul Island, AK.....1055

Letter from Louis Howard to John Lindsay RE: Draft Interim Action Report for Southwest point Battery Site Non-TPA Site St. Paul Island Version 2.0 March 15, 2001 1081

Site Cleanup Report - Final, Former Southwest Point LORAN Station Site (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska.....1083

Letter from Louis Howard to John Lindsay RE: Draft Site Cleanup Report for Southwest Point LORAN Station Battery Debris Site (Non-TPA Site) Pribilof Islands Restoration St. Paul Island April 24, 2001. Dated May 24, 2001 1097

Final

Interim Removal Action Report

St. Paul Island, AK

Southwest Point Battery Site

Version 2.0

March 15, 2001

Prepared for:

National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office
7600 Sandpoint Way NE, Bin C15700
Seattle, WA 98115-0070

Prepared by:

Columbia Environmental Sciences, Inc.
8382 West Gage Blvd., #413
Kennewick, WA 99336

Table of Contents

Table of Contents i
Executive Summary ii

1.0 Introduction 1

2.0 Site Background 2
2.1 Location and Overview 2
2.2 Geology and Geomorphology 2
2.3 Geohydrology 3
2.4 Natural Resources 3
2.5 Past, Current, and Future Land Use 4
2.6 History of Contamination Issues 4

3.0 Purpose and Scope of Interim Removal Action 6
3.1 Release Discovery 6
3.2 Preliminary Risk Characterization 6
3.3 Design of Interim Removal Action 6

4.0 The Interim Removal Action 7

5.0 Evaluation of Interim Removal Action 8

6.0 References 9

Tables

Table 1. Physical Parameters of Soil Samples T-1
Table 2. Analytical Results for Closure Samples T-1

Figures

Figure 1. Location of Southwest Point F-1
Figure 2. Configuration of Southwest Point F-2
Figure 3. Overview of Southwest Point F-3
Figure 4. Overview of Southwest Point F-4

Appendices

Appendix A: Site Photography
Appendix B: Laboratory Results

Executive Summary

The Southwest Point Site is located on the extreme southwestern corner of Saint Paul Island, Alaska. The site is not a Two-Party Agreement site. Southwest Point was the site of a United States Army Loran Station operated by the U.S. Coast Guard during the 1940s. The buildings were demolished and drums and debris were removed in the 1950s through the 1990s. The site is now in light recreational use.

In 1999 discarded lead-acid battery fragments were discovered in a low swale at the site. The origin of the batteries is not known. The batteries were removed and soils were sampled, showing residual lead contamination. In September, 2000 an Interim Removal Action was conducted. Lead-contaminated soils were physically removed, staged, and disposed of off-island. The swale was backfilled with clean scoria.

The Interim Removal Action was successful in preventing human and environmental exposure and in mitigating any further leaching of the lead-contaminated soils.

1.0 Introduction

The National Oceanic and Atmospheric Administration's (NOAA) National Ocean Service (NOS), through its Office of Response and Restoration (OR&R), Pribilof Project Office (PPO) is responsible for site characterization and restoration activities on Saint Paul Island, Alaska. One of those sites is Southwest Point, located at the extreme southwestern corner of the island. Southwest Point is a former United States Army Loran Station operated by the U.S. Coast Guard (USCG) in the 1940s - 1960s (DOD 1985). The site is currently in light recreational use.

In 1999 a pile of battery fragments was discovered at Southwest Point in a low swale. The origin and party(ies) responsible for the battery disposal are not known. The batteries were removed, and soil testing showed residual levels of lead contamination. In September, 2000, the PPO directed Columbia Environmental Sciences, Inc. (CESI) to remove the lead contaminated soils as part of an interim removal action (IRA). The IRA was completed in September, 2000. This Interim Removal Report (IRR) documents the rationale, activities, and results of the IRA pursuant to ADEC regulations (18 AAC 75.330, Interim Removal Actions) and associated guidance.

The following section of the IRR contains a brief discussion of the site background and history. The third section of the IRA focuses on the rationale for the IRA. The fourth section documents the activities, and the fifth section discusses the results.

2.0 Site Background

General background information for Saint Paul Island and the sites investigated by CESI during the summer field season are contained in Master Appendix A (CESI, 2001). In this section we present background information of specific relevance to the battery disposal swale at Southwest Point.

2.1 Location and Overview

Figure 1 is a composite aerial photograph of Saint Paul Island showing the location of Southwest Point. Southwest Point is located on the extreme southwestern corner of the island, approximately 5 miles northwest of the Village of Saint Paul. Southwest Point is located at the end of the main road extending west from Telegraph Hill.

The approximate latitude and longitude of the Southwest Point Battery Site are 57º 09′ 50″ and 170º 24′ 55″ (WGS 1984). Southwest Point is located in the southeast and southwest quarters of Section 7, Township 35 South, Range 132 West, Seward Meridian. Southwest Point lies within the 130.77-acre parcel of land surveyed as Tract F, US Survey No. 4943. The battery disposal site is located in Lot 2, which is the western portion of Tract F (BLM 1968 and BLM 1986).

Figure 2 is an aerial photograph of the site and surroundings. Figure 3 is a ground-based photograph of the site and surroundings with a view to the north, and Figure 4 is an overview to the south. Southwest Point is bordered by undeveloped land in all directions. The Bering Sea is approximately 500 feet south and 300 feet west of the site. A cabin (for recreational use) is located approximately 1000 feet east of the site. The site is at the end of the main road leading west from Telegraph Hill. This road terminates at a turnaround that is approximately 100 feet west of the battery disposal area.

2.2 Geology and Geomorphology

- The site geology is dominated by basalt.

Fractured basalt is the primary geologic unit in surface exposure across the site. The basalt is highly jointed and almost friable in texture. These basalts are mapped as Bf in the Pribilof Stratigraphic Units (CESI, 2001). The basalt is emplaced in horizontal flows that are cut by dikes and sills (Barth, 1956). The basalts are among the youngest on Saint Paul Island, with potassium-argon age dates all lower than one million years of age (Lee-Wong et al., 1979).

- The site geomorphology is dominated by basalt flows.

The basalt in emplaced in areally-extensive flows. The origin of the flows is the Einuhnuhto Bluffs (approximately 1.5 miles north of the site). The ground surface

generally slopes from north to south across the site. On a local scale the ground surface is rough and uneven.

The ocean shoreline in this area is south and west of the site. The shoreline is a high rocky cliff (from 50 to several hundred feet high) with a low wave-cut platform at the base. The shoreline gradient is steep, and the terrain indicates a high-energy erosional environment. The ocean shoreline is reasonably stable; it appears in much the current configuration on maps from the 1890s to the present.

2.3 Geohydrology

- There are two expressions of surface water at the Southwest Point site.

The first expression of surface water is the Bering Sea which lies approximately 500 feet south and 300 feet west of the site. The shoreline trends approximately east-west south of the site, and approximately north-south west of the site. The surface water is open to the Bering Sea; the salinity, fluid density, and tidal fluctuations of this surface water body are assumed to be similar to those of the Bering Sea as a whole.

The second expression of surface water at the Southwest Point site is a small seasonal pond located about 1000 feet east of the site. This pond was observed during May through early July in 2000, and is associated with snowmelt. Later in the season the ground appeared soft, but there was no expression of surface water. This damp area east of the site is apparently a long-term feature; a shallow (hand-dug) well is present in the center of the damp area, and this well was present during the 1940s (USCG, 1946). There are no other lakes or streams.

- The occurrence and characteristics of groundwater at the site are not known.

Groundwater was observed to be present within 20 feet of the ground surface throughout the field season in the shallow well 1000 feet east of the site. The lateral extent of this occurrence is not known. Groundwater was not encountered in any of the IRA activities (see Section 4). The land surface at the site is about 70 feet above Mean-Low-Low-Water.

2.4 Natural Resources

Parts of the site are lightly disturbed, with building foundations and scoria pads remaining in place from the U.S. Coast Guard occupation from the 1940s to the early 1960s. The remainder of the site and vicinity are undisturbed. The cliff areas south and west of the site are mapped as high concentrations of birds, including several endangered or threatened species (NOAA, 1998). The coastline is not designated as a seal rookery for at least several miles to the east or north of the site. The site has no scoria, gravel, or other geologic resources of significant commercial value. The site is located in an aircraft advisory zone related to the high concentrations of birds.

2.5 Past, Current, and Future Land Use

Prior to the 1940s, the site and vicinity were in no developed uses. During the 1940s the United States Army Loran Station was developed at the site and operated by the U.S. Coast Guard. The two buildings closest to the battery site were the Commissary Hut and the Tank and Stores Hut (USCG, 1946). The Loran Station was abandoned in the early 1960s. The cabin located east of the site dates from at least the 1940s. The remaining land in the area has never been in any developed use.

Public access to the site is unrestricted. There are no gates, and the site is at the end of a regularly maintained road. During the 2000 field season CESI staff observed frequent recreational use of the area. The main use in the near vicinity of the site is for vehicular parking; most of the recreational use of the vicinity revolves around bird watching (cliffs to the south and west) and hiking (the trail north to Rush Hill is well-traveled by hikers).

In the Ataqan Akun Community Plan (City of Saint Paul, 1995) the area and surroundings are designated as "O" for Open Space land use.

2.6 History of Contamination Issues

• Harmon (1983) investigated waste disposal practices on Saint Paul Island. Harmon did not discuss Southwest Point.

• The U.S. Army Corps of Engineers (ACOE) identified the former Loran Station as Site A under its Saint Paul Defense Environmental Restoration Program (DoD, 1985). ACOE contracted with Chase Construction, Inc. in 1985 to clean all debris associated with this approximately 3-acre site. However, no full documentation of site closure activities is known to exist.

• Buckel (1990) prepared an environmental compliance survey of identified sites on Saint Paul Island. Buckel did not discuss Southwest Point.

• ADEC (1991) conducted a preliminary assessment of identified sites on Saint Paul Island. They listed Southwest Point as "Site D". Their findings were:

"This site was cleaned during the DERA 1985 cleanup. There were several small cement pads and a few larger ones that were probably quonset huts scattered in the area. Across the road where two foundations were present, there was a pit full of debris including old batteries, brake pads, spark plug, etc. Whether this debris was missed in the cleanup or placed there after the cleanup is undetermined. Right around the parking lot area there are parts of drums (bungs, 6" parts of rim) scattered in the soil."

• E&E (1993) conducted a preliminary assessment of identified sites on Saint Paul Island. They did not discuss Southwest Point. This report provided the framework for the Two-Party Agreement (TPA) sites. Southwest Point is not a TPA site.

Summary - the site has had a relatively low level of concern and discussion. The discovery of battery fragments in a shallow swale at the site is consistent with the observations of one of the previous studies.

3.0 Purpose and Scope of Interim Removal Action

Southwest Point is not a TPA site. Southwest Point is not under active site investigation or characterization by the PPO. The presence of batteries and lead-contaminated soil was confirmed during the 1999 field season. The PPO directed that an Interim Removal Action be undertaken to prevent human and environmental exposure to the released material and to prevent any further migration of the material at the site.

3.1 Release Discovery

The release was discovered during the 1999 field season (TTEMI, 2000). The battery fragments were removed by NOAA and the soil was tested. The presence of lead contamination in the soils was confirmed.

3.2 Preliminary Risk Characterization

- The preliminary risk characterization was low:

The battery fragments had been physically removed from the site by NOAA in 1999, staged in an overpack, and shipped off-island for disposal in 2000. Lead contaminated soils remained in place at the site in a shallow swale, but the quantity and extent of the contaminated area was very small (approximately three feet by nine feet). Although the vicinity is in regular recreational use, the particular area near the swale is not a strongly attractive part of the recreational opportunities in the area.

The major concern with the remaining lead contamination in the soils was the potential for ingestion by recreational users, particularly children.

3.3 Design of Interim Removal Action

The goal of the IRA was to prevent human exposure to the contaminated soil. Because the contaminated soils were highly localized, physical removal was selected for the IRA. We decided to excavate the contaminated soil to the maximum extent possible (given the geologic terrain). All of the removed soil was to be placed in a container designed for shipping contaminated soils, sealed, and staged for shipment off-island and disposal. The swale was to be backfilled with clean scoria to a depth of at least three feet.

4.0 The Interim Removal Action

The Interim Removal Action was performed by CESI and PPO personnel on September 24, 2000. The weather was good and there were no limiting conditions. Photographs of the Interim Removal Action are shown in Appendix A.

The excavation was performed with a backhoe. Prior to excavation, the swale was examined and soils from the sidewalls and bottom were field screened for lead. Field screening was performed using a Lead-Chek™ test kit according to the manufacturer's instructions. The Lead-Chek™ test is qualitative, indicating the presence of lead by a colorimetric reaction. Two of the bottom samples showed a positive reaction, indicating the presence of lead contamination.

The soils in the swale were poorly developed, consisting mostly of basalt chips and fragments. The loose rock chips were removed by the backhoe. Then the backhoe operator removed larger pieces of basalt ranging from fist-sized cobbles to small boulders. A total of one cubic yard of soil and rock was removed from the swale. At the end of the removal, the bottom of the excavation was largely competant basalt.

The backhoe was used to remove a large boulder from the bottom of the excavation to allow a bottom sample to be taken (SWPBS - EB). In addition, two sidewall samples were taken (SWPBS - WS and - SS). A split of each soil sample was screened with the Lead-Chek™ test kit, all with lightly positive results. The remainder of each soil sample was packaged for laboratory analysis for total lead. The physical parameters of the soil samples are provided in Table 1.

The excavation was backfilled with clean scoria from the Ridge Wall scoria pit on September 25, 2000. Approximately 2 cubic yards of backfill were used. The minimum thickness of clean scoria backfill was three feet.

The soil sack was transported to the Decommissioned Power Plant Annex foundation in Tract 46. During this time, the Annex foundation was used as a staging area for materials that were to be transported on the debris barge. The soil sack was shipped on the debris barge by Nortech in September, 2000.

Laboratory analyses for total lead were performed using EPA Method 6010. The results are tabulated in Table 2. The full analytical laboratory sheets are provided in Appendix B. The action level for the IRR was established at 1000 mg/kg. This action level was based on ADEC (2000), Table B1, Note 11 and the established non-residential use of the area. All of the closure results were below the action level set for the IRA.

5.0 Evaluation of Interim Removal Action

The goal of the IRA was to prevent human exposure to the contaminated soil. The physical removal was accomplished without incident, and the contaminated soils were removed from Saint Paul Island. The Interim Removal Action was successful in meeting the goal.

6.0 References

ADEC. 1991. Preliminary Assessment Report for St. Paul Island Pribilof Islands, Alaska. State of Alaska, Department of Environmental Conservation.

ADEC. 2000. 18AAC75, Articles 3 and 9. Oil and Hazardous Substances Pollution Control Regulations. State of Alaska.

Barth, T. F. W. 1956. Geology and Petrology of the Pribilof Islands Alaska. United States Department of the Interior, Geological Survey Bulletin 1028 - F.

BLM. 1968. US Survey Number 4943, Alaska. Tracts A through G. Bureau of Land Management.

BLM. 1986. Plat of Township 35 South, Range 132 West of the Seward Meridian, Alaska. Bureau of Land Management.

Buckel, S. 1990. Environmental Compliance Survey Report, Pribilof Islands, Alaska. Facilities and Logistics Division, Western Administrative Support Center.

CESI. 2001. Background Information on Saint Paul Island, Alaska. Columbia Environmental Sciences, Inc.

City of Saint Paul. 1995. Ataqan Akun Community Plan.

DoD. 1985. Department of Defense Division 1 Report. 13 September 1985.

E&E. 1993. Preliminary Assessment of National Oceanic and Atmospheric Administration Sites, Pribilof Islands, Alaska. Ecology and Environment, Inc.

Harmon, C. H. (1983) Field and Project Report, Waste Disposal St. Paul Island. State of Alaska, Department of Environmental Conservation. File No. 10-1-1983.

Lee-Wong, F., T. L. Vallier, D. M. Hopkins, and M. L. Silberman. 1979. Preliminary Report on the Petrography and Geochemistry of Basalt from the Pribilof Islands and Vicinity, Southern Bering Sea. United States Geological Survey. Open File Report 79-1556.

NOAA. 1998. Pribilof Islands, Alaska Environmentally Sensitive Areas.

TTEMI. 2000. Technical Memorandum. Debris Removal and Confirmation Sampling. Southwest Point Debris Site. St. Paul Island, Alaska. December 26, 2000

USCG. 1946. St. Paul Loran Station Topography Map. United States Coast Guard. Drawing No. 528, Sheet 1 of 2.

Tables

Table 1. Physical Parameters of the Soil Samples.

Parameter	SWPBS EB
Northing (ft)	20786276
Easting (ft)	1756186
Elevation (ft, MSL)	60
Depth Top (ft, Below Original Ground Surface)	4.0
Depth bottom (ft, Below Original Ground Surface)	4.5
Depth Top (ft, Below Base of Excavation)	0.0
Depth Bottom (ft, Below Base of Excavation)	0.5
Collection Date	09/24/00
Collection Time	15:33
Collection Method	Stainless Spoon
Parameter	**SWPBS WS**
Northing (ft)	20786276
Easting (ft)	1756186
Elevation (ft, MSL)	60
Depth Top (ft, Below Original Ground Surface)	3.0
Depth bottom (ft, Below Original Ground Surface)	3.5
Collection Date	09/24/00
Collection Time	15:27
Collection Method	Stainless Spoon
Parameter	**SWPBS SS**
Northing (ft)	20786276
Easting (ft)	1756186
Elevation (ft, MSL)	60
Depth Top (ft, Below Original Ground Surface)	3.0
Depth bottom (ft, Below Original Ground Surface)	3.5
Collection Date	09/24/00
Collection Time	15:33
Collection Method	Stainless Spoon

Table 2. Analytical Results for Closure Samples.

Sample	Total Lead
SWPBS-EB	110
SWPBS-WS	760
SWPBS-SS	130

Figures

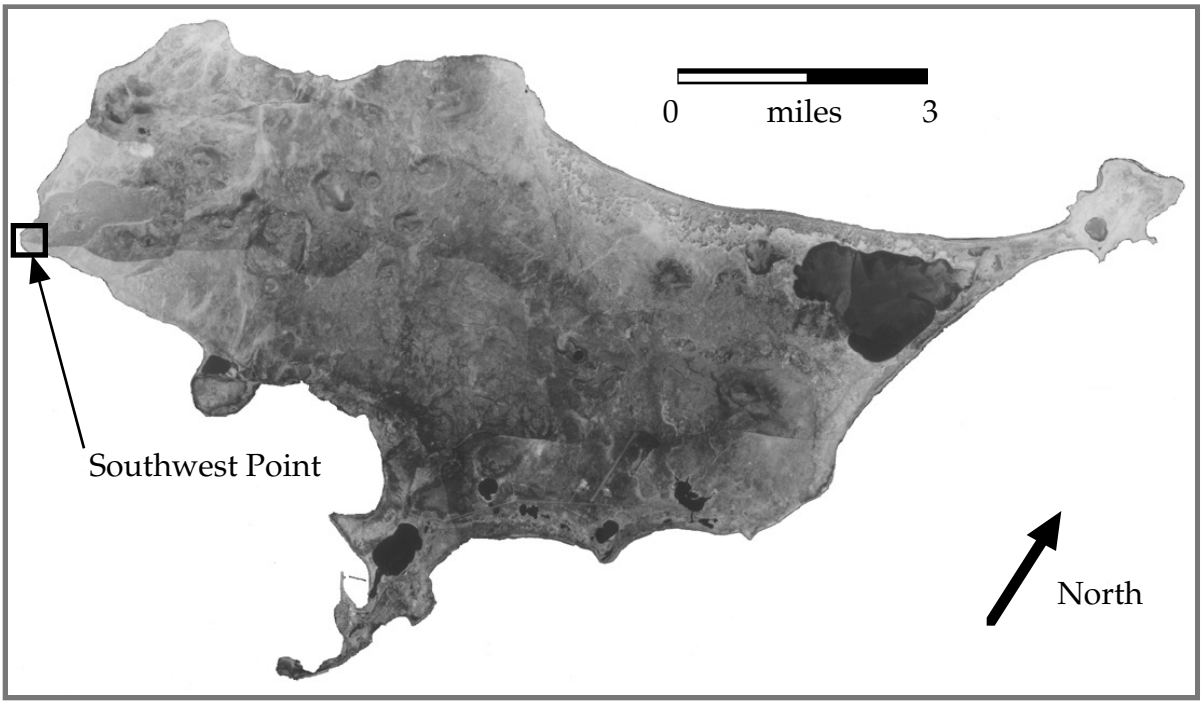


Figure 1. Location of Southwest Point. The base is a composite aerial photograph of St. Paul Island (AeroMap US, Inc., 1993). Southwest Point, outlined in black, is located on the extreme southwestern part of the island.

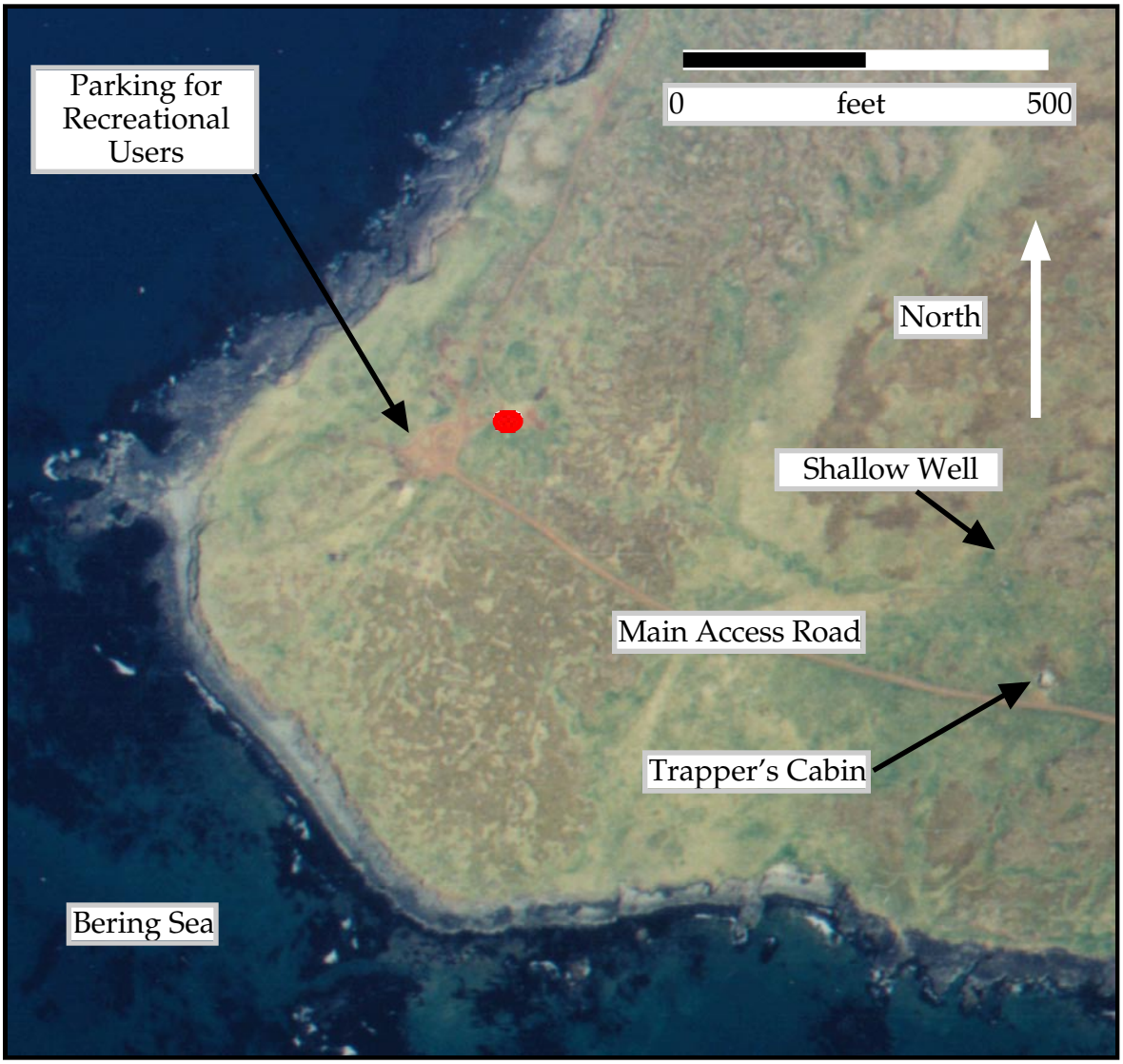


Figure 2. Configuration of Southwest Point. The base is an aerial photograph of St. Paul Island (AeroMap US, Inc., 1993). The location of the battery disposal site is indicated by the red oval.

Figure 3. Overview of Southwest Point. This photograph was taken from the southern part of the site near the location of the SNP Loran benchmark (recovered by CESI in May, 2000). The location of the battery disposal swale is indicated by the green arrow. The Einuhnuhto Bluffs are in the background. Note the basalt outcrop across the site.

Photo ID:	CESI0241
File ID:	P5170032
Date:	05/17/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	N/A
Site:	Southwest Point, Overview
View:	North

Figure 4. Overview of Southwest Point. This photograph was taken from the southern flank of the Einuhnuhto Bluffs. The location of the battery disposal swale is indicated by the green arrow. The Bering Sea (and Otter Island) are in the background.

Photo ID:	CESI1156
File ID:	P7230032
Date:	07/23/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	N/A
Site:	Southwest Point, Overview
View:	South

Appendix A

Site Photography

A1. Start of the IRA excavation. Note the poorly developed soils and the shallow swale. The Einuhnuhto Bluffs are in the background.

Photo ID:	CESI2090
File ID:	P9240004
Date:	09/24/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	N/A
Site:	Southwest Point
View:	North

A - 1

A2. IRA in progress. Note the poorly developed soils and the shallow swale.

Photo ID:	CESI2091
File ID:	P9240005
Date:	09/24/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	N/A
Site:	Southwest Point
View:	North

A3. IRA in progress. Note the poorly developed soils and the shallow swale.

Photo ID:	CESI2092
File ID:	P9240006
Date:	09/24/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	N/A
Site:	Southwest Point
View:	South

A4. IRA nearing completion. Note increased size of basalt cobbles relative to photographs A2 and A3.

Photo ID:	CESI2094
File ID:	P9240008
Date:	09/24/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	N/A
Site:	Southwest Point
View:	West

A5. Site conditions approximately one week after IRA. Note scoria fill in center (darker material). Bering Sea in background. Vehicle in right background belonged to CESI field crew; vehicle in left background was typical of recreational use of the area.

Photo ID:	CESI2357
File ID:	PA030011
Date:	10/03/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	N/A
Site:	Southwest Point
View:	West

STATE OF ALASKA

TONY KNOWLES, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269-7552
Fax: (907) 269-7649
http://www.state.ak.us/dec/

May 24, 2001

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-0070

RE: Draft Interim Action Report for Southwest Point Battery Site Non-TPA Site St. Paul Island Version 2.0 March 15, 2001

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (ADEC) has received the above document on May 1, 2001. Below are ADEC's comments.

Section 4.0 The Interim Removal Action Page 7
Based on a review of the data presented in the report, ADEC concurs that the action was successful and no additional remedial action is required for the NON-TPA Site *Southwest Point Battery Site*. This no further remedial action determination is only for the *Southwest Point Battery*. However, if in the future, additional contamination is discovered at this site, further investigation and/or remedial actions will be requested of NOAA by ADEC. ADEC reserves its rights, under 18 AAC 75 Oil and Other Hazardous Substances Pollution Control regulations and AS 46.03 to require NOAA to conduct additional assessment and/or corrective actions, if information indicates the site conditions pose an unacceptable risk to human health, safety, or welfare, or to the environment.

If you have any questions regarding this letter, please don't hesitate to call me at (907) 269-7552.

Sincerely,

Louis Howard
Project Manager

cc: Jennifer Roberts, DEC Anchorage
Breck Tostevin, AGO
Pribilof Islands RAB Members

lhoward\SW PT 2001 IRA.doc

NOAA STP NON-TPA SW Pt. genl corr

SITE CLEANUP REPORT - FINAL

Former Southwest Point LORAN Station Site
(Non Two-Party Agreement Site)

Pribilof Islands Site Restoration
St. Paul Island, Alaska

June 6, 2001

Prepared For:
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office

Prepared By:

ENVIRONMENTAL & ENGINEERING CONSULTANTS
Fairbanks, Alaska

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY 1085
2.0 INTRODUCTION 1085
2.1 Objectives 1085
2.2 Methodology and Applicable Regulations 1086
3.0 SITE BACKGROUND 1086
3.1 Island Historical Information 1086
3.2 Island Environmental Setting 1086
3.2.1 Climate 1087
3.2.2 Geology and Soil 1087
3.2.3 Surface Water and Groundwater 1087
3.3 Site Description 1087
3.3.1 Geology and Soil 1088
3.3.2 Surface Water and Groundwater 1088
3.4 Previous Investigations And Other Activities 1088
4.0 FIELDWORK ACTIVITIES 1088
4.1 Debris Removal 1088
4.2 Soil and Groundwater Sampling 1089
5.0 DEBRIS AND SUSPECT SOILS DISPOSAL 1089
5.1 Debris Disposal and Recycling 1089
5.2 Soil Disposal and Remediation Treatment 1090
6.0 DISCUSSION 1090
7.0 CONCLUSIONS AND RECOMMENDATIONS 1091

APPENDICES

Appendix 1: Figures & GPS Information
Appendix 2: Site Photographs
Appendix 3: Daily Reports (plus Hazardous Materials Manifests)
Appendix 4: Laboratory Analytical Reports
Appendix 5: Site Video Documentation

1.0 EXECUTIVE SUMMARY

NORTECH Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to a non-TPA Site, the Southwest Point LORAN Station battery debris site, on St. Paul Island, Alaska to remove lead-contaminated soils. This contaminated site had been impacted by the freezing and bursting of several lead acid batteries and remaining presence of minor lead battery plate debris.

NORTECH executed a pair of brief soil hand-excavation events to containerize lead-impacted soils on July 13th and August 7, 2000, but both of the soil clearance samples collected and analyzed indicated the continued presence of lead contamination which exceeded ADEC's current industrial soil cleanup standard of 1,000 mg/Kg. The lead-impacted soils removed from the site by ***NORTECH*** were placed into three open-top drums and hauled away for disposal as part of a formally manifested hazardous waste shipment removed from St. Paul and taken to Seattle, WA.

A separate Draft Interim Removal Action Report prepared by CESI in March 2000 details their removal of an additional 1 CY of lead-tainted soil from this site, and the collection of three clearance samples which all indicate analytical results at less that 1,000 mg/Kg. Based on a review and analysis of available project photographs, Daily Reports, our personnel's memories, and the CESI report, ***NORTECH*** arrived at the following environmental conclusions:

- The Southwest Point LORAN Station battery spill site's soils are now removed sufficiently so that all remaining in-situ soils contain lead at levels below the applicable (industrial) ADEC soil cleanup standard of 1,000 mg/Kg.
- Petroleum Hydrocarbon contamination of either the site's soils or its groundwater is considered unlikely at this site, given the lack of any evidence of any significant spills, leaks, or other petroleum hydrocarbon releases at this lead-contamination site.

Based on these conclusions, ***NORTECH*** recommends the following:

- No Further Action nor need for any additional lead-contaminated soil removal to be performed at this previously lead-impacted soil removal site.

2.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration, is responsible for environmental restoration activities on St. Paul and St. George Islands, Alaska. Collectively, these islands are part of a five island archipelago known as the Pribilof Islands. Under Public Law 104-91, NOAA is responsible for the cleanup of debris, landfills, wastes, storage tanks, hazardous and unsafe conditions, as well as contaminants including petroleum products and their derivatives left by NOAA on lands transferred or obligated for transfer on the Pribilof Islands. Affected properties are described in a two party agreement (TPA) between NOAA and the Alaska Department of Environmental Conservation (ADEC) dated January 26, 1996 (NOAA 1996). Under State of Alaska environmental regulations and in accordance with the TPA, NOAA has undertaken an array of site characterization and restoration activities on St. Paul and St. George Islands. Additional work must be conducted to satisfy the TPA, including limited site characterization, remediation, confirmation sampling, and site restoration (NOAA 1996).

Under Contract No. 52ABNA500049, Task Order 56ABNA703706, ***NORTECH*** Environmental and Engineering Consultants (***NORTECH***) has prepared this Site Cleanup Report for the Former SW Point LORAN Station site, to report on the debris removal and environmental assessment activities which occurred during the 2000 fieldwork season.

2.1 Objectives

The overall objective for the St. Paul Debris Removal project undertaken by ***NORTECH*** was to develop a written plan of action, have it approved by NOAA and ADEC, and execute it for each TPA and non-TPA site. At each re-

moval area ***NORTECH*** was to accomplish the acts necessary to gain a no-further-action designation from ADEC, or else gain an understanding of the corrective action efforts that could eventually lead to proper site closure.

2.2 Methodology and Applicable Regulations

In order to meet the project objective, ***NORTECH*** developed a draft Corrective Action Plan and an array of Sampling & Analysis Plans (SAPs) in March 2000 for eleven designated St. Paul debris sites. They were reviewed and approved by NOAA and ADEC, fieldwork was begun in mid-April, and completed by late November 2000. The fieldwork was performed in accordance with the Corrective Action Plan, the site's SAP, and the 1996 Two Party Agreement (TPA) between ADEC and NOAA including the following 1991 versions of ADEC's regulations and associated guidance documents, as referenced in the TPA, particularly sections 21 to 28, 59, and 103 which call for the application of:

- 18 Alaska Administrative Code (AAC) 70 Water Quality Standards
- 18 AAC 75 Oil and Hazardous Substances Pollution Control
- Underground Storage Tank Procedures Manual, Guidance for Treatment of Petroleum Contaminated Soil and Water and Standard Sampling Procedures

3.0 SITE BACKGROUND

This section provides a brief discussion of the location and history of the Pribilof Islands, weather and environmental conditions on St. Paul Island, a site description, and a summary of previous investigations ***NORTECH*** was aware of at this specific St. Paul debris removal site.

3.1 Island Historical Information

Russia first discovered the Pribilof Islands and associated seal rookeries in 1786. In the 1820s, Russia established a settlement on St. Paul Island to support fur seal harvesting. The United States acquired the Pribilof Islands in 1867, when Alaska was purchased from Russia. In 1869, the United States made the Pribilof Islands a federal reservation. From 1869 to 1909, the United States contracted fur seal harvesting and pelt processing to private companies. From 1910 to 1979, the federal government was the sole operator and administrator of the Pribilof Islands. In 1971, the Alaska Native Claims Settlement Act passed, which provided for the transfer of property and management of the islands to Alaskan Native regional and village corporations.

The only major landowners on St. Paul Island are the Tanadgusix Corporation (TDX) and the federal government. Minor landowners include the City of St. Paul, the St. Paul Tribal Council, and the State of Alaska. The federal government currently retains title to about 1,515 acres on St. Paul Island, which consists of seal rookeries and administrative offices managed by the National Marine Fisheries Service, bird rookeries managed by the U.S. Fish & Wildlife Service, a U.S. Coast Guard (USCG) LORAN station, two scoria pits, the current landfill, and a National Weather Service station. The island's airport, which consists of about 67 acres of land, was conveyed to the State of Alaska in 1989.

3.2 Island Environmental Setting

St. Paul Island is located between latitude 57° 06' and 57° 15' North and longitude 170° 05' and 170° 25' West. It is surrounded by the Bering Sea, and is about 800 miles west southwest of Anchorage and 300 miles north northwest of Dutch Harbor, Alaska. The island is about 44 square miles in area (Figure 1). About 27 centerline miles of road bisect the island north south and east west. The City of St. Paul is located on the southern peninsula of the island; its 1998 population included 761 people (ADL 1999). St. Paul Island has many sand dunes and is vegetated with grasses and small forbes over the majority of its area. The vegetation is broadly classified as moist tundra. Some common plant species present on the island include blue lupine, arctic poppy, beach wild rye, and sea beach sandwort.

St. Paul Island serves as a nesting area for a great number of seabirds and a rookery area for northern fur seals. Commercial crab harvesting areas are located within 15 miles of the island. Major harvest species are the Tanner crab and Korean Hair crab.

3.2.1 Climate

The climate of the island is classified as subpolar. Maritime weather conditions prevail on the island, with predominantly cloudy, foggy, and windy conditions. Total annual precipitation averages 23.3 inches, with most occurring between the months of April and October. The mean monthly temperature ranges from 22.4°F in winter to 47.8°F in summer, with a mean annual temperature of 34.8°F. Wind speeds range from nil to over 100 miles per hour, with an average of 17.2 miles per hour (NCDC 1999).

3.2.2 Geology and Soil

St. Paul Island is composed of basaltic lava flows and sills overlain by a thin veneer of tuffaceous and scoriaceous material, glacial sediment, and sandy material that has formed dunes on the eastern portion of the island. A number of cinder cones rise to a maximum elevation of 665 feet. The cones are moderately steep sided, with several having craters at their summits. A gently rolling topography, averaging 200 feet in elevation, occurs between the cones.

The shoreline along the Bering Sea ranges from rocky sea cliffs and headlands to short, steep beaches and is generally composed of cobbles, gravel, and sand. The shoreline of the western portion of the island is generally rocky sea cliffs and headlands, with beach shoreline and back dunes present in other portions.

3.2.3 Surface Water and Groundwater

Many lakes are located on St. Paul Island, but no streams are known to exist. The largest lake, Big Lake, is located on the northeastern part of the island. Sheep Lake is located west of Big Lake. Other smaller lakes are located in the southern portion of the island. The lakes with direct estuarine connection to the Bering Sea (for example, the Salt Lagoon) tend to be brackish; the remaining lakes are freshwater. Much of the surface of the island is composed of sandy or scoriaceous material that allows for rapid infiltration of water. Presently, little else is known about the island's groundwater.

The City of St. Paul obtains its municipal water supply from four wells located about 1.5+ miles northeast of the city and immediately east of Telegraph Hill (Fredreka I, Fredreka II, south well, and north well). A fifth well serves the USCG LORAN station. These wells are reportedly completed within the basalt aquifer. The four municipal wells are connected by pipelines that supply three 200,000 gallon water storage tanks located on a hill above the city.

3.3 Site Description

The Former Southwest Point LORAN Station lead-impacted soils cleanup "site" is not referenced as a debris site under the Two Party Agreement (TPA). It is located near the far western coastline of St. Paul Island, at the end of the well-maintained two-lane road leading to that portion of the island. The nearest ocean shoreline is approximately 500 feet directly to the west of this small, contaminated site, and it is approximately 5.4 miles west and north of the city center (Figure 1, Appendix 1). The site can be readily accessed by the two-lane road, which leads westward from an intersection with the Polovina Turnpike near the north end of the Salt Lagoon, just below Telegraph Hill.

The U.S. Department of Defense reportedly established a Long Range Navigation (LORAN) facility at this general location during World War II, which was taken out of service after the current LORAN station near the St. Paul Airport was brought into service in the 1960's. (See Draft Technical Memorandum – Debris Removal and Confirmation Sampling, Southwest Point Debris Site, by Tetra Tech EM, Inc., dated December 17, 1999) The graded and revegetated area that was pointed out to ***NORTECH*** as the former site of the SW Point LORAN station is indicated on Figure 2.

In 1986 Chase Construction, Inc., under contract to the U.S. Army Corps of Engineers, conducted debris removal at this area, being referenced as "Formerly Used Defense Site A", involving an area of approximately 3 acres.

Chase demolished and disposed of two building foundations, concrete blocks and concrete-filled drums, and 80 CY of miscellaneous debris. (TTEMI, 1999)

Later, during October 1999, local residents directed NOAA personnel to a small depression just northeast of the access road's cul-de-sac (Figure 2 and Photo 1, Appendix 2: Site Photographs). The depression contained several burst lead acid batteries and other debris near the site of the former SW Point LORAN station and Army Camp.

3.3.1 Geology and Soil

The Former SW Point LORAN Station site is located on a flat shelf of volcanic bedrock, thinly overlain by a layer of scoria soil and a sparse vegetative mat. (Photo 2) This area is clearly an arctic tundra environment, with only an inch or two of coarse soil underlying poorly-established native plants and grasses. The underlying volcanic scoria bedrock is broken and faulted, causing minor undulations in the ground surface.

3.3.2 Surface Water and Groundwater

The nearest surface water body to the site is the Bering Sea, whose shoreline is approximately 300 feet west of the lead-impacted soils site. The depth to groundwater at the site is unknown, but assumed to be the vertical distance (25 – 30 feet) from the bedrock bench to the Bering Sea's adjacent water surface.

3.4 Previous Investigations And Other Activities

As noted earlier, ***NORTECH*** reviewed TTEMI's 1999 environmental assessment report, which describes the FUDS A efforts accomplished in 1986, as well as Tetra Tech's October 1999 environmental sampling results from this lead-impacted soils site.

NOAA personnel had conducted limited battery and debris removal activities in early October 1999, placing weathered and cracked marine-type, lead acid batteries and other rubbish into two 55-gallon steel drums, which were over-packed into 85-gallon plastic drums and taken to the Garco warehouse at the NMFS Staff Compound (Tract 50). (These battery materials were manifested and disposed of as hazardous wastes by ***NORTECH*** in September 2000, which is tracked by the manifest sheets included at the back of Appendix 3: Daily Reports, specifically by Manifest 00268, page 2 of 2, line 28 h.)

Tetra Tech EM, Inc. went to the battery removal site to do soil sampling on October 13, 1999. They collected three samples, located as noted below, and analyzed them for lead content by EPA SW-846 Method 6010. Given that the current ADEC lead-in-soils cleanup levels for residential land is 400 mg/Kg, and for industrial lands is 1,000 mg/Kg, it was clear that further soil removal was necessary, although Tetra Tech recommended that either the U.S. Department of Defense or island's residents accept responsibility for the cleanup since NOAA had not conducted any operations at this site, nor did they own or control the land.

Tetra Tech EM, Inc		**Analytical Result:**
Sample No.	Sample Location	Lead (mg/Kg)
X3SS01-010	At the location of burst battery removal	13,000
X3SS02-010	At lowest point of depression where debris was found	389
X3SS03-010	Background sample: 15' away from debris area	8.6

4.0 FIELDWORK ACTIVITIES

4.1 Debris Removal

NORTECH was shown the exact location of the lead-contaminated soils site by NOAA on June 26, 2000 (Photos 1 & 2), and then mobilized its own personnel, a BSE workman, several shovels and two polyethylene open-top drums to the SW Point site on July 13, 2000. (Photos 3 – 5, and Appendix 3: Daily Reports) Approximately ¾ cubic yard of soil and several small pieces of lead battery plates were placed in the two drums, which were

then hauled to the NMFS Staff Compound and stored at the NOAA Staging Area to await transport and disposal off-island. After the battery storage area's thin layer of granular soils was removed, a clearance soil sample was collected and labeled SPN 20712-004-S. This sample was analyzed for the presence of lead, using EPA SW-846 Method 6010, and yielded a result which required that further soils be removed from the site to gain clearance. (Table 1)

On August 7, 2000 both ***NORTECH*** and BSE personnel returned to this contaminated site and dug up another partial drum of soils from atop the bedrock at this impacted area, including additional small clumps of ground at the periphery of the earlier soil removal zone. It was difficult to removal any additional soil from within the original boundary of the lead acid spill site because the soil layer was so thin (< 6") and the initial soil removal effort had collected almost all of the loose soils down to the underlying bedrock. Another soil clearance sample, SNP 2087-004-S, was collected and analyzed for lead, which was again found to exceed the allowable ADEC soil clearance level. (Photo 6)

4.2 Soil and Groundwater Sampling

On July 13, 2000, after almost two 85-gallon overpack drums of soil were removed, a ***NORTECH*** employee sampled the limited remaining granular soils still present at the bottom of the battery damage location, and submitted that soil sample, SPN 20712-004-S, to CT&E for lead analysis using EPA SW-846 Method 6010. The result, as shown in Table 1, was 1,870 mg/Kg lead.

After the second soil removal event was completed, a second soil clearance sample was collected, SNP 2087-004-S, and analyzed for lead content. (Photo 6) The analytical result was 25,800 mg/Kg lead, again exceeding the allowable ADEC soil cleanup limit.

No staining or any other indication of the presence of petroleum or other contamination was observed near this battery damage site, and no other sampling was performed by ***NORTECH*** at this site. The disturbed vegetation found at the battery site was a result of the NOAA debris removal action in 1999.

No groundwater was exposed or seen near this site during soil removal and cleanup, and therefore no water samples were collected or analyzed from the site.

Table 1. Soil Analytical Results (from base of cleanup site)
Metals: Lead

	ADEC Regulatory Cleanup Level (18 AAC 75.341)	SPN 20712-004-S (mg/Kg)	PQL (mg/Kg)	SNP 2087-004-S (mg/Kg)	PQL (mg/Kg)
Analyses					
Metals: (mg/Kg) **Pb**	1,000	**1,870**	3.64	**25,800**	42.3

Note: ADEC's Regulatory limits were taken from Tables A1 and B1, Under 40-inches Category, "Migration to Groundwater Pathway" in the ADEC's 18 AAC 75, dated October 1999.

Bolded numbers indicate the contaminant concentration is above the ADEC regulatory soil cleanup limit.

5.0 DEBRIS AND SUSPECT SOILS DISPOSAL

5.1 Debris Disposal and Recycling

No miscellaneous debris, metals, or other wastes were removed from this site by ***NORTECH*** for disposal or treatment. The drummed soils and bits of lead battery plates were the only material containerized and hauled away from this site during summer 2000.

5.2 Soil Disposal and Remediation Treatment

The three drums of lead-contaminated soil excavated and containerized on July 12th and August 7th, and removed from this site by ***NORTECH***, were temporarily stored at the NMFS Staff Compound and then transported on October 26, 2000 to Chemical Waste Management, as part of a larger hazardous materials shipment to Seattle by Western Pioneer, for proper treatment and disposal.

The two drums filled on July 12th can be found on Manifest 00003, page 1 of 2, line d, and the single drum from August 7th can be found on the same Manifest, page 1 of 2, line a. Similarly, the broken battery parts removed from the SW LORAN site by NOAA in September 1999, and temporarily stored for the winter at the Garco Building, were consolidated with a large array of other batteries being removed from the island. The battery parts and whole batteries were placed in two plastic totes and shipped off-island with Western Pioneer on September 16, 2000, to Onyx Environmental Services. This shipment is noted on Manifest 00268, page 2 of 2, line h.

The last manifest provided in this report documents the movement off-island of the supersack with 1 CY of lead-impacted soils and rock excavated by CESI. This material moved with Manifest 00765, page 1 of 2, line b. The Western Pioneer shipment left St. Paul on January 10, 2001, and the contaminated soils were sent to Chemical Waste Management of the Northwest.

The paperwork documenting each of these disposal shipments is included at the back of Appendix 3: Daily Reports.

6.0 DISCUSSION

NORTECH completed the excavation, containerization, transport and removal of three drums, about 1 CY, of lead-impacted soil and minor lead debris from the Southwest Point LORAN Station battery debris site in 2000. In addition, they handled the disposal of the broken battery parts and miscellaneous wastes from the NOAA cleanup action performed in October 1999; and the disposal of impacted soil from CESI's excavation in September 2000.

Each of these lead-acid battery wastes and lead-impacted soils were properly disposed of as manifested hazardous wastes by ***NORTECH*** and NOAA. The hazmat manifest paperwork is attached below as part of Appendix 3: Daily Reports.

The cleanup objectives outlined in the Corrective Action Plan prepared by ***NORTECH*** for the Pribilof Islands Site Restoration Project and stated in Section 2.1 above were not met as the result of ***NORTECH***'s fieldwork, since the analytical results for soil lead content derived from the soil samples collected were not low enough to recommend final site closure.

It was of some surprise to have the second soil analysis, SNP 2087-004-S, yield a lead content result even higher than the first sample, SPN 20712-004-S. ***NORTECH*** suspects that the reason for this increased lead content was due to the site-specific circumstance that the lead acid spill penetrated the shallow soil layer and collected in a concentrated form at the soil/bedrock interface, which was where the second sample was collected. It is not anticipated that the lead contamination extended very deeply into the site's bedrock.

NORTECH has been made aware that Columbia Environmental Sciences, Inc. (CESI) mobilized personnel to this cleanup site with an excavator on September 24, 2000 and removed approximately 1 CY of additional soil and surficial rock to complete the cleanup and closure of this lead-contamination site. At the end of the removal, the bottom of the excavation was (reportedly) largely competent basalt.

CESI has prepared a draft report for NOAA, dated March 15, 2000, that documents and reports on their soil removal and closure activities at the SW LORAN battery site. Each of the three soil clearance samples collected and analyzed for lead content by CESI were less than the action level set for the site, of 1,000 mg/Kg. It appears that after three rounds of excavation during the summer of 2000, the lead battery site has been remediated to within the allowable soil cleanup values.

7.0 CONCLUSIONS AND RECOMMENDATIONS

NORTECH Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to a non-TPA Site, the Southwest Point LORAN Station battery debris site, on St. Paul Island, Alaska to remove lead-contaminated soils. This contaminated site had been impacted by the freezing and bursting of several lead acid batteries and remaining presence of minor lead battery plate debris.

NORTECH executed a pair of brief soil hand-excavation events to containerize lead-impacted soils on July 13th and August 7, 2000, but both of the soil clearance samples collected and analyzed indicated the continued presence of lead contamination which exceeded ADEC's current industrial soil cleanup standard of 1,000 mg/Kg. The lead-impacted soils removed from the site by ***NORTECH*** were placed into three open-top drums and hauled away for disposal as part of a formally manifested hazardous waste shipment removed from St. Paul and taken to Seattle, WA.

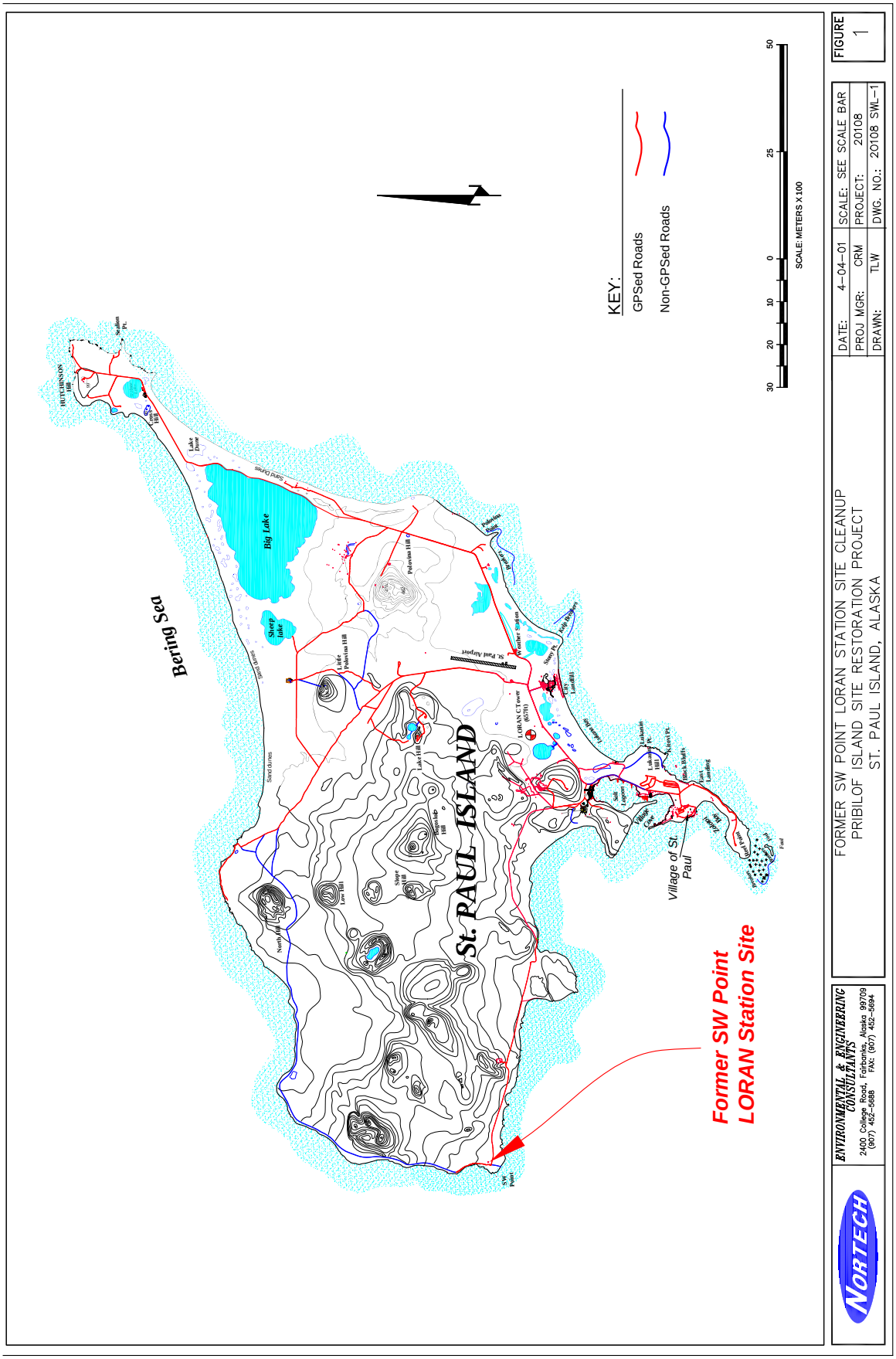
A separate Draft Interim Removal Action Report prepared by CESI in March 2000 details their removal of an additional 1 CY of lead-tainted soil from this site, and the collection of three clearance samples which all indicate analytical results at less that 1,000 mg/Kg. Based on a review and analysis of available project photographs, Daily Reports, our personnel's memories, and the CESI report, ***NORTECH*** arrived at the following environmental conclusions:

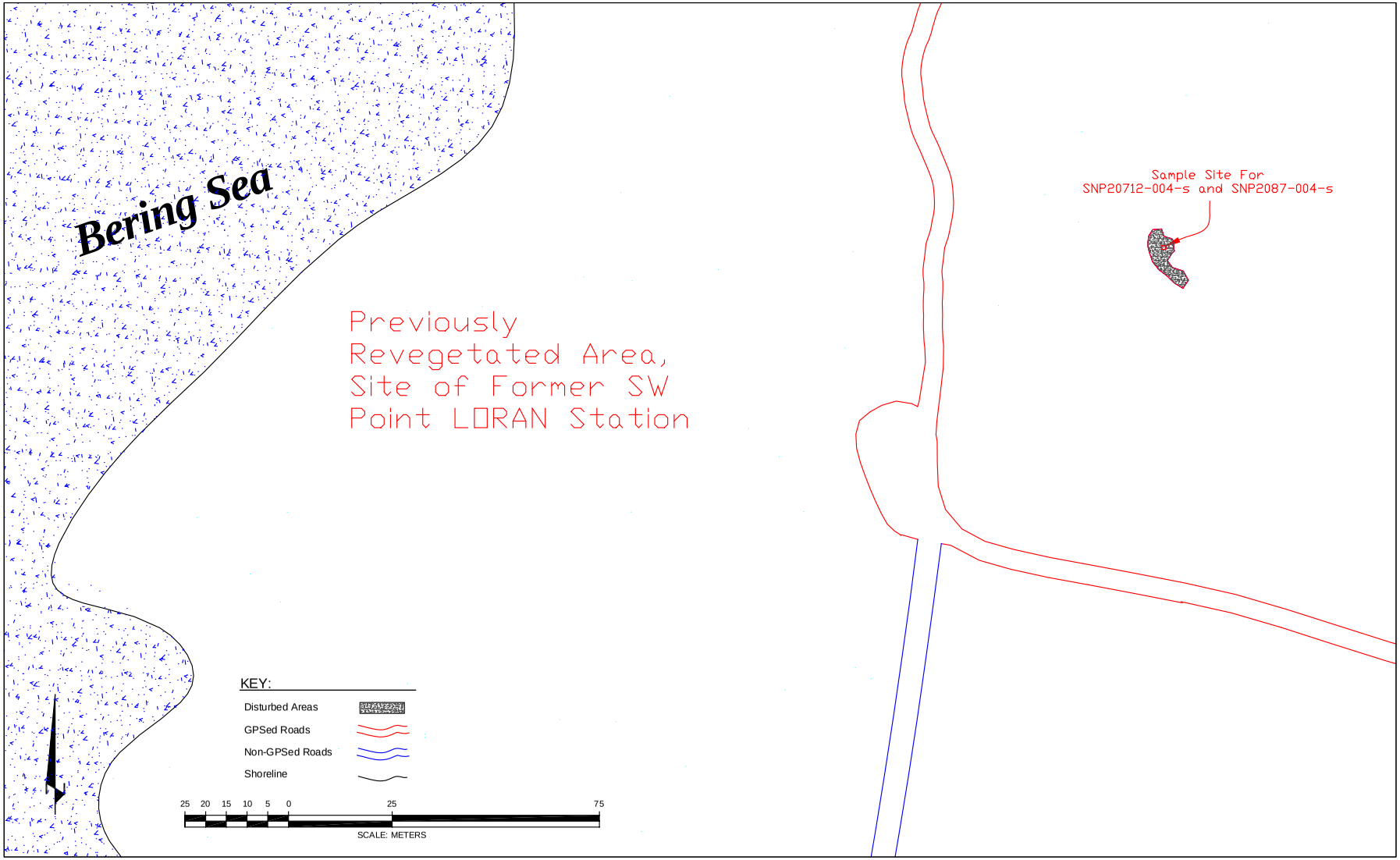
- The Southwest Point LORAN Station battery spill site's soils are now removed sufficiently so that all remaining in-situ soils contain lead at levels below the applicable (industrial) ADEC soil cleanup standard of 1,000 mg/Kg.
- Petroleum Hydrocarbon contamination of either the site's soils or its groundwater is considered unlikely at this site, given the lack of any evidence of any significant spills, leaks, or other petroleum hydrocarbon releases at this lead-contamination site.

Based on these conclusions, ***NORTECH*** recommends the following:

- No Further Action nor need for any additional lead-contaminated soil removal to be performed at this previously lead-impacted soil removal site.

APPENDIX 1: Figures & GPS Information





NORTECH

ENVIRONMENTAL & ENGINEERING CONSULTANTS
2400 College Road, Fairbanks, Alaska 99709
(907) 452-5688 FAX: (907) 452-5694

FORMER SW POINT LORAN STATION SITE CLEANUP
PRIBILOF ISLAND SITE RESTORATION PROJECT
ST. PAUL ISLAND, ALASKA

DATE:	4-04-01	SCALE:	SEE SCALE BAR
PROJ MGR:	CRM	PROJECT:	20108
DRAWN:	TLW	DWG. NO.:	20108 SWL-2

FIGURE 2

APPENDIX 2: Site Photographs

Photo 1: C81502F0.jpg General view, looking west, of the Former SW Point LORAN site. (6/26/00)
The site of lead battery soil contamination is just out of view, to the right side of this photograph.

Photo 2: C81500F0.jpg Site of former lead-acid battery storage, where battery lead plate pieces were found and the soils and surficial bedrock below vegetative ground cover was impacted by lead contamination.

Photo 3: C81508G0.jpg Lead-tainted soils being dug out and placed into two polyethelene open-top drums by ***NORTECH*** and BSE personnel, on July 13, 2000.

Photo 4: C81506G0.jpg Close-up view of the site's ground surface, showing small pieces of lead plates still present as well as other misc. debris at the contaminated site.

Photo 5: C81512G0.jpg View of SW LORAN cleanup site, once impacted soil removal was almost completed on 7/13/00. Extent and degree of surface contamination was larger than initially imagined.

Photo 6: C81517I0.jpg View of lead-impacted soils cleanup site once another session of soil removal, down to underlying bedrock, was performed on August 7, 2000. Scoop is at sample site SNP2087-004-S.

(r.C.2.c)
P.45 016

STATE OF ALASKA

TONY KNOWLES, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269-7552
Fax: (907) 269-7649
http://www.state.ak.us/dec/

May 24, 2001

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-0070

RE: Draft Site Cleanup Report for Southwest Point LORAN Station Battery Debris Site (Non-TPA Site) Pribilof Islands Restoration St. Paul Island April 24, 2001

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (ADEC) has received the above document on May 7, 2001. Below are ADEC's comments.

Section 7.0 Conclusions and Recommendations Page 9
Based on a review of the data presented in the report, ADEC concurs that no additional remedial action is required for the NON-TPA Site *Former Southwest Point LORAN Battery Debris Site.* This no further remedial action determination is only for the *Former Southwest Point LORAN Battery Debris Site.* However, if in the future, additional contamination is discovered at this site, further investigation and/or remedial actions will be requested of NOAA by ADEC. ADEC reserves its rights, under 18 AAC 75 Oil and Other Hazardous Substances Pollution Control regulations and AS 46.03 to require NOAA to conduct additional assessment and/or corrective actions, if information indicates the site conditions pose an unacceptable risk to human health, safety, or welfare, or to the environment.

If you have any questions regarding this letter, please don't hesitate to call me at (907) 269-7552.

Sincerely,

Louis Howard

Louis Howard
Project Manager

cc: Jennifer Roberts, DEC Anchorage
Breck Tostevin, AGO
Pribilof Islands RAB Members

lhoward\Former SW PT LORAN 2001.doc

NOAA STP NON-TPA SW Pt. genl corr.

1200-01-P0045-I.016-0002

NOAA Site 46
NTPA: Blubber Dump Debris

Debris Removal Report - Draft - Former Blubber Dump (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska.....1101

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report Former Blubber Dump (Non Two Party Agreement Site) Pribilof Islands Site Restoration Project, St. Paul Island, AK February 5, 2001. Dated March 2, 2001.....1113

Notice of Environmental Cleanup and Residual Soil and Debris at Blubber Dump Debris Site, St. Paul Island, Alaska.....1115

DEBRIS REMOVAL REPORT - FINAL -

Former Blubber Dump
(Non Two-Party Agreement Site)

Pribilof Islands Site Restoration
St. Paul Island, Alaska
June 6, 2001

Prepared For:
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office

Prepared By:

ENVIRONMENTAL & ENGINEERING CONSULTANTS
Fairbanks, Alaska

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY 1103
2.0 INTRODUCTION 1103
2.1 Objectives 1103
2.2 Methodology and Applicable Regulations 1104
3.0 SITE BACKGROUND 1104
3.1 Island Historical Information 1104
3.2 Island Environmental Setting 1104
3.2.1 Climate 1105
3.2.2 Geology and Soil 1105
3.2.3 Surface Water and Groundwater 1105
3.3 Site Description 1105
3.3.1 Geology and Soil 1105
3.3.2 Surface Water and Groundwater 1105
3.4 Previous Investigations And Other Activities 1106
4.0 FIELDWORK ACTIVITIES 1106
4.1 Debris Removal 1106
4.2 Soil and Groundwater Sampling 1106
5.0 DEBRIS AND SUSPECT SOILS DISPOSAL 1106
5.1 Debris Disposal and Recycling 1106
5.2 Soil Disposal and Remediation Treatment 1106
6.0 DISCUSSION 1107
7.0 CONCLUSIONS AND RECOMMENDATIONS 1107

APPENDICES

Appendix 1: Figures & GPS Information
Appendix 2: Site Photographs
Appendix 3: Daily Reports (and Scrap Recycle Receipt)
Appendix 4: Laboratory Analytical Reports – not prepared for this debris site
Appendix 5: Site Video Documentation

1.0 EXECUTIVE SUMMARY

The Former Blubber Dump, which is a non-Two Party Agreement (non-TPA) Site, is located just north of the head of the Salt Lagoon, which is near the shore of English Bay, on St. Paul Island. ***NORTECH*** Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to the Former Blubber Dump, and administered a brief program of debris removal on June 5, 2000. Two truck axles, two crane boom sections, and a miscellaneous array of metal and other debris was excavated, loaded, and hauled away for disposal and recycling off-island. Based on review and analysis of available project photographs, Daily Reports, and limited field observations, ***NORTECH*** has arrived at the following environmental conclusion:

- The small quantity of soil disturbed by ***NORTECH*** at the Former Blubber Dump site was not contaminated by petroleum hydrocarbons based on the absence of odors, visible soil staining or stressed vegetation.

Based on this conclusion, ***NORTECH*** recommends the following:

- No further cleanup efforts will be necessary at the re-vegetated areas disturbed at the Former Blubber Dump in order to remove the surface debris previously visible there.

2.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration, is responsible for environmental restoration activities on St. Paul and St. George Islands, Alaska. Collectively, these islands are part of a five island archipelago known as the Pribilof Islands. Under Public Law 104-91, NOAA is responsible for the cleanup of debris, landfills, wastes, storage tanks, hazardous and unsafe conditions, as well as contaminants including petroleum products and their derivatives left by NOAA on lands transferred or obligated for transfer on the Pribilof Islands. Affected properties are described in a two party agreement (TPA) between NOAA and the Alaska Department of Environmental Conservation (ADEC) dated January 26, 1996 (NOAA 1996). Under State of Alaska environmental regulations and in accordance with the TPA, NOAA has undertaken an array of site characterization and restoration activities on St. Paul and St. George Islands. Additional work must be conducted to satisfy the TPA, including limited site characterization, remediation, confirmation sampling, and site restoration (NOAA 1996).

Under Contract No. 52ABNA500049, Task Order 56ABNA703706, ***NORTECH*** Environmental and Engineering Consultants (***NORTECH***) has prepared this Debris Removal Report for the Former Blubber Dump site, to report on the debris removal and environmental assessment activities which occurred during the 2000 fieldwork season.

2.1 Objectives

The overall objective for the St. Paul Debris Removal project undertaken by ***NORTECH*** was to develop a written plan of action, have it approved by NOAA and ADEC, and execute it for each TPA and non-TPA site. At each removal area ***NORTECH*** was to accomplish the acts necessary to gain a no-further-action designation from ADEC, or else gain an understanding of the corrective action efforts that could eventually lead to proper site closure.

2.2 Methodology and Applicable Regulations

In order to meet the project objective, ***NORTECH*** developed a draft Corrective Action Plan and an array of Sampling & Analysis Plans (SAPs) in March 2000 for eleven designated St. Paul debris sites. They were reviewed and approved by NOAA and ADEC, fieldwork was begun in mid-April, and essentially completed in late November 2000. The fieldwork was performed in accordance with the Corrective Action Plan, the site's SAP, and the 1996 Two Party Agreement (TPA) between ADEC and NOAA including the following 1991 versions of ADEC's regulations and associated guidance documents, as referenced in the TPA, particularly sections 21 to 28, 59, and 103 which call for the application of:

- 18 Alaska Administrative Code (AAC) 70 Water Quality Standards
- 18 AAC 75 Oil and Hazardous Substances Pollution Control
- Underground Storage Tank Procedures Manual, Guidance for Treatment of Petroleum Contaminated Soil and Water and Standard Sampling Procedures

3.0 SITE BACKGROUND

This section provides a brief discussion of the location and history of the Pribilof Islands, weather and environmental conditions on St. Paul Island, a site description, and a summary of previous investigations ***NORTECH*** was aware of at this specific St. Paul debris removal site.

3.1 Island Historical Information

Russia first discovered St. Paul Island and its seal rookeries in 1786. In the 1820s, Russia established a settlement on St. Paul Island to support fur seal harvesting. The United States acquired the Pribilof Islands in 1867, when Alaska was purchased from Russia. In 1869, the United States made the Pribilof Islands a federal reservation. From 1869 to 1909, the United States contracted fur seal harvesting and pelt processing to private companies. From 1910 to 1979, the federal government was the sole operator and administrator of the Pribilof Islands. In 1971, the Alaska Native Claims Settlement Act passed, which provided for the transfer of property and management of the islands to Alaskan Native regional and village corporations.

The only major landowners on St. Paul Island are the Tanadgusix Corporation (TDX) and the federal government. Minor landowners include the City of St. Paul, the St. Paul Tribal Council, and the State of Alaska. The federal government currently retains title to about 1,515 acres on St. Paul Island, which consists of seal rookeries and administrative offices managed by the National Marine Fisheries Service, bird rookeries managed by the U.S. Fish & Wildlife Service, a U.S. Coast Guard (USCG) LORAN station, two scoria pits, the current landfill, and a National Weather Service station. The island's airport, which consists of about 67 acres of land, was conveyed to the State of Alaska in 1989.

3.2 Island Environmental Setting

St. Paul Island is located between latitude 57° 06' and 57° 15' North and longitude 170° 05' and 170° 25' West. It is surrounded by the Bering Sea, and is about 800 miles west southwest of Anchorage and 300 miles north northwest of Dutch Harbor, Alaska. The island is about 44 square miles in area (Figure 1). About 27 centerline miles of road bisect the island north south and east west. The City of St. Paul is located on the southern peninsula of the island; its 1998 population included 761 people (ADL 1999). St. Paul Island has many sand dunes and is vegetated with grasses and small forbes over the majority of its area. The vegetation is broadly classified as moist tundra. Some common plant species present on the island include blue lupine, arctic poppy, beach wild rye, and sea beach sandwort.

St. Paul Island serves as a nesting area for a great number of seabirds and a rookery area for northern fur seals. Commercial crab harvesting areas are located within 15 miles of the island. Major harvest species are the Tanner crab and Korean Hair crab.

3.2.1 Climate

The climate of the island is classified as subpolar. Maritime weather conditions prevail on the island, with predominantly cloudy, foggy, and windy conditions. Total annual precipitation averages 23.3 inches, with most occurring between the months of April and October. The mean monthly temperature ranges from 22.4°F in winter to 47.8°F in summer, with a mean annual temperature of 34.8°F. Wind speeds range from nil to over 100 miles per hour, with an average of 17.2 miles per hour (NCDC 1999).

3.2.2 Geology and Soil

St. Paul Island is composed of basaltic lava flows and sills overlain by a thin veneer of tuffaceous and scoriaceous material, glacial sediment, and sandy material that has formed dunes on the eastern portion of the island. A number of cinder cones rise to a maximum elevation of 665 feet. The cones are moderately steep sided, with several having craters at their summits. A gently rolling topography, averaging 200 feet in elevation, occurs between the cones.

The shoreline along the Bering Sea ranges from rocky sea cliffs and headlands to short, steep beaches and is generally composed of cobbles, gravel, and sand. The shoreline of the western portion of the island is generally rocky sea cliffs and headlands, with beach shoreline and back dunes present in other portions.

3.2.3 Surface Water and Groundwater

Many lakes are located on St. Paul Island, but no streams are known to exist. The largest lake, Big Lake, is located on the northeastern part of the island. Sheep Lake is located west of Big Lake. Other smaller lakes are located in the southern portion of the island. The lakes with direct estuarine connection to the Bering Sea (for example, the Salt Lagoon) tend to be brackish; the remaining lakes are freshwater. Much of the surface of the island is composed of sandy or scoriaceous material that allows for rapid infiltration of water. Presently, little else is known about the island's groundwater.

The City of St. Paul obtains its municipal water supply from four wells located about 1.5 miles north-northeast of the city and immediately east of Telegraph Hill (Fredreka I, Fredreka II, south well, and north well). A fifth well serves the USCG station. These wells are reportedly completed within the basalt aquifer. The four municipal wells are connected by pipelines that supply three 200,000 gallon water storage tanks located on a hill above the city.

3.3 Site Description

The Former Blubber Dump has been considered by NOAA to be a debris removal site for several years, but was not specifically listed as an environmental cleanup site under the TPA. It is located in the south-central area of the island, about 0.15 miles north of the northern shoreline of the Salt Lagoon, and about 0.25 miles east of the ocean shoreline of Tolstoi and English Bay (Figure 1, Appendix 1). Reportedly, excess seal blubber generated by the northern fur seal butchering operations of St. Paul Island had been dumped here for decades.

3.3.1 Geology and Soil

The site is located in a sand dune environment, near the western coastline and therefore heavily scoured by winds. The thickness of the sand and the depth to bedrock are not known.

3.3.2 Surface Water and Groundwater

The nearest surface water body to the Blubber Dump is the Salt Lagoon, which is fed by a narrow channel from the St. Paul harbor, near the southern end of the island. Alternatively, the Bering Sea is about 0.25 mile west of the site. No freshwater bodies are located at or near the site. Depth to groundwater at the site is not directly known, however, NOAA reportedly placed a well for non-drinking use within 300 feet of this site. According to NOAA, groundwater was reached at 95 feet below ground surface.

3.4 Previous Investigations And Other Activities

NORTECH is not aware of any existing environmental reports involving the Former Blubber Dump, i.e. the areas disturbed by our project efforts and depicted on Figure 2.

4.0 FIELDWORK ACTIVITIES

4.1 Debris Removal

On June 5, 2000, ***NORTECH*** mobilized several workmen and suitable heavy equipment to the grassy valley just south of and "below" the Blubber Dump PCS stockpile workpad. (Figure 2, Appendix 1) The crew unearthed and removed two truck rear axles, two wheel hubs, two sections of crane boom, and approximately 500 pounds of miscellaneous debris. (Photos 1&2, Appendix 2: Site Photographs and Appendix 3: Daily Reports) The debris removal work was completed in less than a single day's crew work. A flatbed truck hauled the accumulated debris from the site (Photo 3) to the solid waste/debris staging area at NOAA's administrative "compound" on Tract 50. Backfill sand was placed at the site and back-dragged to promote simple re-vegetation. (Photo 4)

During the debris removal operations a constant watch was kept to assure that there were no automotive fluids or contaminants spilled from the unearthed vehicle axles and differentials. As noted in the Daily Report for June 5, no soil staining was observed during the removal efforts, and no other evidence, such as odors or stressed vegetation, indicated that this site's soils had been contaminated with petroleum hydrocarbons or other contaminants.

On July 11, 2000, BSE workers returned to the Blubber Dump, laid out 4' wide strips of jute mesh and transplanted clumps of nearby hardy plants and grasses to reclaim the disturbed area. Pictures were taken of the area on August 11, 2000, after all field activities had ended. (Photos 5 & 6)

4.2 Soil and Groundwater Sampling

No analytical soil sampling was performed for this site, nor was any deemed necessary since no odors, staining or evidence of spills or past fluid releases were observed near the removed debris. No Photoionization Detector (PID) fieldscreening was performed at this site either.

5.0 DEBRIS AND SUSPECT SOILS DISPOSAL

5.1 Debris Disposal and Recycling

The metal debris removed from the Former Blubber Dump site was temporarily staged on Tract 50 (the NOAA/NMFS compound), as part of a large metal debris pile behind the Garco warehouse and Combine Building. In mid-September 2000, this metal debris was transported to a large walled barge at the St. Paul dock. The barge was towed to Seattle and was unloaded at the Seattle Iron & Metals yard on the Duwamish River at the end of September 2000. All tires and rubber had been stripped from the truck axles and recycled separately, while the miscellaneous steel, copper, and aluminum items were processed and recycled by the salvage yard. (See receipt for recycled metals from Seattle Iron & Metals in Appendix 3: Daily Reports)

5.2 Soil Disposal and Remediation Treatment

No PID readings were taken at the Former Blubber Dump, and no analytical samples were collected or analyzed. No soils were removed from this site for remediation at the nearby PCS thermo-volatilization facility.

6.0 DISCUSSION

NORTECH completed the removal of all visible solid wastes, including two sections of crane boom and the axles from two abandoned trucks, which were above the ground surface and surficial grasses at small valley just south of the Former Blubber Dump. The cleanup objectives outlined in the Corrective Action Plan for the Pribilof Islands Site Restoration Project and stated in Section 2.1 above were met for the disturbed areas depicted on Figure 2.

Care was taken to avoid spills or releases of automotive fluids from the differentials unearthed at the Former Blubber Dump site, and no soil contamination was observed in the limited area where buried debris was removed from the site.

7.0 CONCLUSIONS AND RECOMMENDATIONS

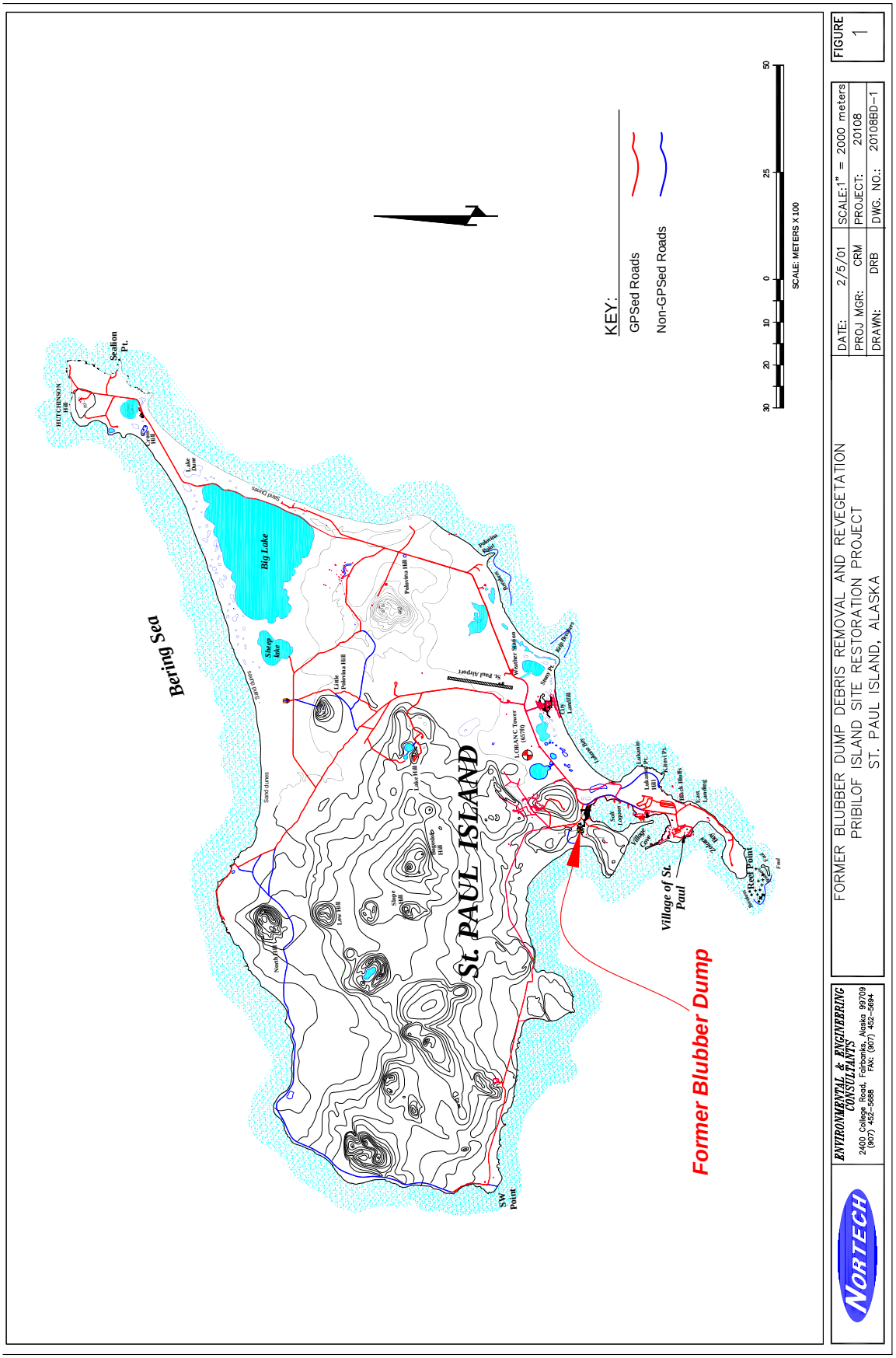
The Former Blubber Dump, which is a non-Two Party Agreement (non-TPA) Site, is located north of the head of the Salt Lagoon, and east of the English Bay shoreline, on St. Paul Island. ***NORTECH*** Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to the Former Blubber Dump, and administered a brief program of debris removal on June 5, 2000. Two truck axles, two crane boom sections, and a miscellaneous array of metal and other debris were excavated, loaded, and hauled away for disposal and recycling off-island. Based on review and analysis of available project photographs, Daily Reports, and limited field observations, ***NORTECH*** has arrived at the following environmental conclusion:

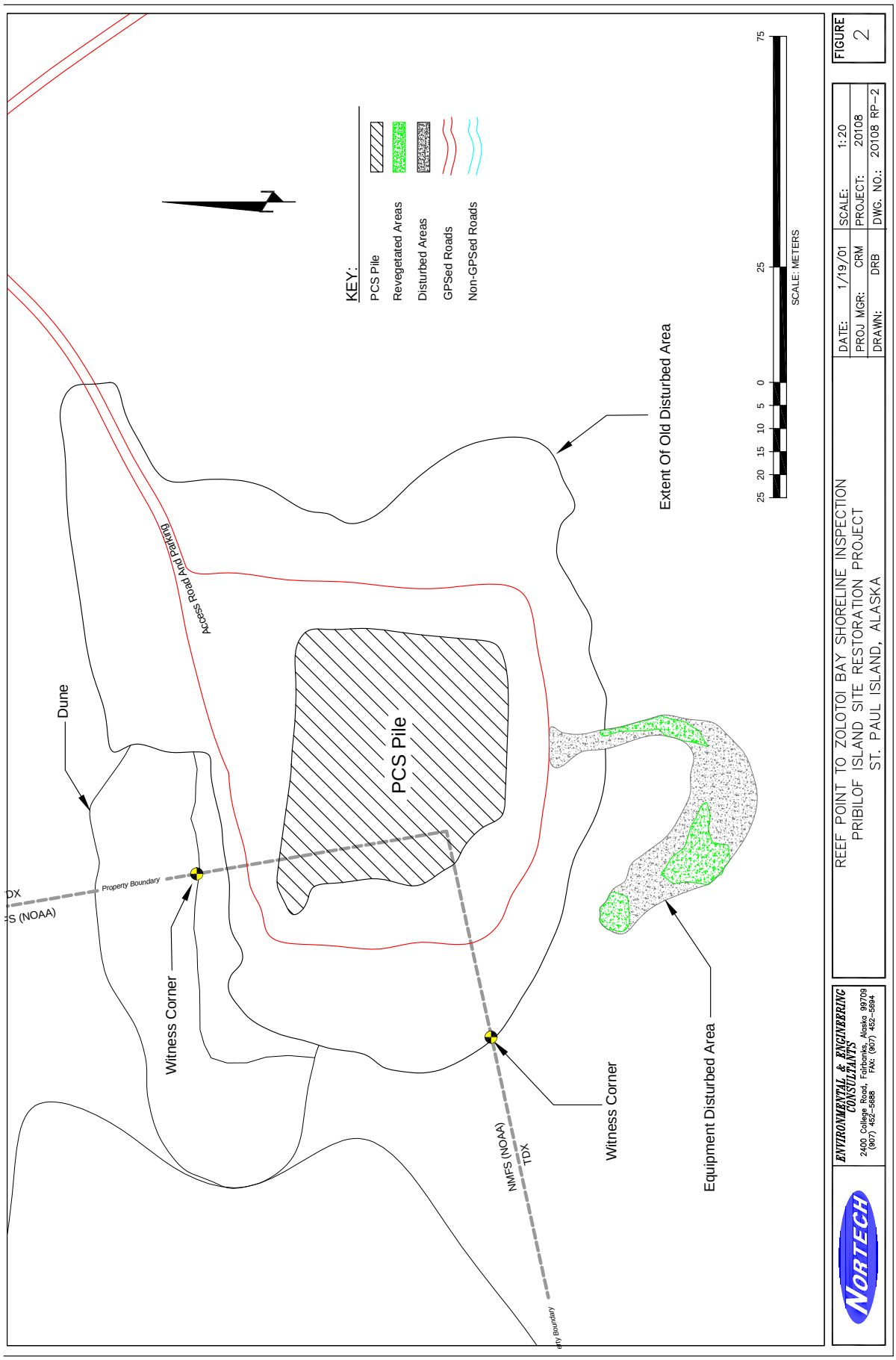
- The small quantity of soil disturbed by ***NORTECH*** at the Former Blubber Dump site was not contaminated by petroleum hydrocarbons based on the absence of odors, visible soil staining or stressed vegetation.

Based on this conclusion, ***NORTECH*** recommends the following:

- No further cleanup efforts will be necessary at the re-vegetated areas disturbed at the Former Blubber Dump, in order to remove the surface debris previously visible there.

APPENDIX 1: Figures & GPS Information




KEY:
PCS Pile
Revegetated Areas
Disturbed Areas
GPSed Roads
Non-GPSed Roads
SCALE: METERS
25 20 15 10 5 0 25 75
Extent Of Old Disturbed Area
Access Road And Parking
Dune
PCS Pile
Property Boundary
Witness Corner
Witness Corner
Equipment Disturbed Area
NMFS (NOAA)
TDX
REEF POINT TO ZOLOTOI BAY SHORELINE INSPECTION
PRIBILOF ISLAND SITE RESTORATION PROJECT
ST. PAUL ISLAND, ALASKA
DATE: 1/19/01
PROJ MGR: CRM
DRAWN: DRB
SCALE: 1:20
PROJECT: 20108
DWG. NO.: 20108 RP-2
FIGURE 2
NORTECH
ENVIRONMENTAL & ENGINEERING CONSULTANTS
2400 College Road, Fairbanks, Alaska 99709
(907) 452-5688 FAX: (907) 452-5694

APPENDIX 2: Site Photographs

Photo 1: C53502F0.jpg: Laborer cuts up crane boom section below ground surface for removal.

Photo 2: C53510F0.jpg: Loader pulls buried axle and tire out of site.

Photo 3: C53515F0.jpg: Flatbed loaded with some of the debris removed from Blubber Dump.

Photo 4: C535520F0: Backfill at disturbed area and road gouges from PCS stockpile pad to debris site.

Photo 5: C53508H0.jpg: Revegetation at disturbed area, with jute mesh and plants in place.

Photo 6: C53510H0.jpg Closer view of typical revegetation area.

STATE OF ALASKA

TONY KNOWLES, GOVERNOR

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269-7552
Fax: (907) 269-7649
http://www.state.ak.us/dec/

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

March 2, 2001

RECEIVED
MAR 5 2001

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way, NE BIN C15700
Seattle, Washington 98115-0070

RE: Draft Site Closure Report Former Blubber Dump (Non Two Party Agreement Site)
Pribilof Islands Site Restoration Project St. Paul Island, AK February 5, 2001

Dear Mr. Lindsay:

The Department of Environmental Conservation (DEC) has received the above document on February 21, 2001. Based on a review of the data presented in the report, ADEC concurs with the conclusion in section 7.0 that no further action is required at the site known as the Former Blubber Dump. However, if in the future, additional contamination is discovered at this site, further investigation and/or remedial actions will be requested of NOAA by ADEC. ADEC reserves its rights, under 18 AAC 75 Oil and Hazardous Substances Pollution Control regulations and AS 46.03 to require NOAA to conduct additional assessment and/or corrective actions, if information indicates the site conditions pose an unacceptable risk to human health, safety, or welfare, or to the environment.

If you have any questions regarding this letter, please call me at (907) 269-7552.

Sincerely,

Louis Howard

Louis Howard
Project Manager

cc: Jennifer Roberts, ADEC Anchorage
Robert A. Taylor, NOAA GC Seattle, WA
Breck Tostevin, AGO
Pribilof RAB Members

2001 former blubber dump clsrc rpt.doc

NOAA-St. Paul Non-TPA site Blubber Dump

A L A S K A

2008-000212-0

Recording Dist: 305 - Aleutian Islands
5/1/2008 2:25 PM Pages: 1 of 5

NOTICE OF ENVIRONMENTAL CLEANUP AND RESIDUAL SOIL AND DEBRIS AT
BLUBBER DUMP DEBRIS SITE,
ST. PAUL ISLAND, ALASKA

Pursuant to 18 AAC 75.375, Tanadgusix Corporation and The Aleut Corporation as the owners, and the U.S. Department of Commerce/National Oceanic and Atmospheric Administration (NOAA), as the operator of the subject property hereby provide public notice that the property located north of the head of the Salt Lagoon, and approximately 0.25 miles inshore (east) from the southerly end of English Bay shoreline is contaminated with animal fats and solid wastes. More specifically the property is described as follows, Township 35 South, Range 132 West, Section 24 Tract 38 Lot 1 of the Seward Meridian, Alaska, Patent No. 50-90-06 Tanadgusix Corp., and is located at 57° 8' 30.20" North Latitude; 170°16' 50.33" West Longitude (Figures 1 and 2), has been subjected to solid waste and animal fats (seal), as a result of a discharge, or release and subsequent cleanup of oil or other hazardous substances, regulated under 18 AAC 75, Article 3 as amended October 2005, and solid waste disposal, which is regulated under 18 AAC 60 as amended August 2003. Buried solid waste and potentially animal fats remain on the property. Adequate soil cover must be maintained over the solid waste to prevent exposure, and excavation into the buried solid waste should be avoided. If contaminated soil or solid wastes are exposed in the future they must be managed in accordance with laws applicable at that time. This release and cleanup are documented in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database under File No. 2644.38.038.

The Blubber Dump Debris Site was not identified as a potential site of concern pursuant to the *Pribilof Islands Environmental Restoration Two Party Agreement* (TPA) between the State of Alaska and NOAA (NOAA 1996). NOAA subsequently addressed the site as NOAA non-TPA Site 46. Following corrective action, ADEC Division of Spill Prevention and Response determined, in accordance with 18 AAC 75.325(f)(1) that site cleanup has been performed to the maximum extent practicable even though debris and undetermined quantities, if any, of animal fat contaminated soils remain on the site property (ADEC 2001). ADEC granted the conditional closure, in part subject to this institutional control (deed notice), and confirmed that no further remedial action was required at the site unless new information becomes available that indicates to ADEC that the site may pose an unacceptable risk to human health, safety, welfare to the environment (ADEC 2001).

Grantor, the US Bureau of Land Management.

Grantees:

- the Tanadgusix Corporation (grantee of the surface estate),
  4300 B Street, Suite 402
  Anchorage, AK 99503-5946

- The Aleut Corporation (grantee of the subsurface estate)
  4000 Old Seward Highway, Suite 300
  Anchorage, AK 99503

Recording District
Aleutian Islands

Remedial Actions and Residual Contamination

The former Blubber Dump Debris Site is an abandoned landfill used by the federal government as a solid waste and seal blubber disposal site. During 2000, NOAA removed debris, such as truck and tractor parts exposed above the soil overburden (Nortech 2001). The site was restored to grade and vegetation planted on exposed soil (Nortech 2001) Figure 2. Currently the site is covered by native grasses. The site covers a surface area of approximately one-quarter of an acre.

Site Use

In the event that information becomes available which indicates that the site may pose an unacceptable risk to human health, safety, welfare or the environment, the land owner and/or operator is required under 18 AAC 75.300 to notify ADEC and evaluate the environmental status of the contamination in accordance with applicable laws and regulations. Further site characterization and cleanup may be necessary under 18 AAC 75.325-.390 and 18 AAC 78.60. Also, any transport, treatment, or disposal of any potentially contaminated soil or water from the site or use of the groundwater at or near the contaminated area requires notification to and approval from the Department in accordance with 18 AAC 75..370(b) and 18 AAC 78.600(h).

In the future, DEC approval is required prior to moving the soil cover over the solid waste pursuant to 18 AAC 60. If contaminated soil and solid wastes are removed from the site, the site must be characterized and managed following regulations applicable at that time including 18 AAC 75.325(i)(1), (2) 18 AAC 60, as amended, and (3) 18 AAC 75.370. ADEC approval is required prior to moving soil or solid wastes that is, or has been, subject to the cleanup rules found at 18 AAC 75.325-.390, and 18 AAC 60 as amended.

This notice remains in effect until a written determination from ADEC is recorded that states that soil at the site has been shown to meet the most stringent soil cleanup levels in Method Two of 18 AAC 75.341 (c) and that off-site transportation of soil is not a concern, and until all wastes are removed from the property.

References:

Alaska Department of Environmental Conservation (ADEC). 2001. Letter from Louis Howard to John Lindsay NOAA. Re: *Draft Site Closure Report for Blubber Dump (Non Two Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska.* March 5.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26.

Nortech. 2001. *Debris Removal Report – Final. Former Blubber Dump (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska.* Prepared for National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration, Pribilof Project Office, 7600 Sand Point Way NE, Seattle, WA. 98115. June 6.

Please return original copy of this notice to the (operator) address below:

Signature: _____

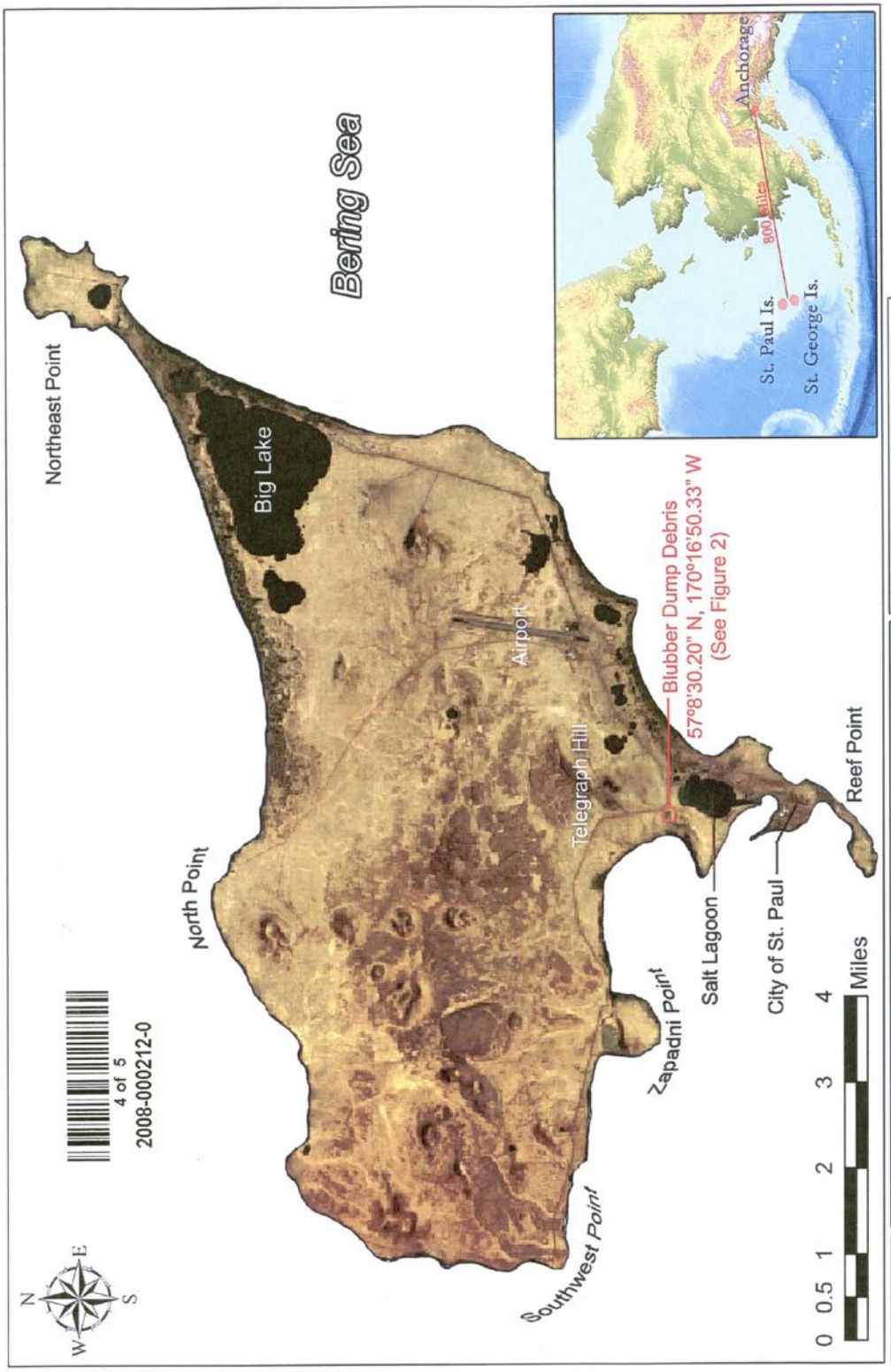
Printed Name: JOHN A LINDSAY

Mailing Address:
Attn: John Lindsay

US DOC, NOAA, NOS, OR&R, PPO
7600 Sand Point Way NE
Bldg 3, RM 1301
Seattle, WA 98115

(seal) Subscribed and sworn to before me this ___ day of _____, 19___.
Notary Public in and for the State of _____
My commission expires:_____

3 of 5
2008-000212-0



Source: Ikonos Satellite Imagery (Space Imaging 2001)
Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 46 - Blubber Dump Debris\SNP Standard Fig 1 - Blubber Dump Debris.psd
Date: 4/24/2008

Pribilof Islands Restoration Project

St. Paul Island Vicinity Map
Blubber Dump Debris
NTPA Site 46
St. Paul Island, Alaska

Figure 1

Figure 2	Legal Property Description Map Tract 38 & Lot 1 of T35S, R132W, S24 Blubber Dump Debris NTPA Site 46 St. Paul Island, Alaska	Source: Blubber Dump Layers (NOAA Pribilof Project GIS 2003 - 2004), Aero-Metric 2006 2 ft Aerial Photo, 1983 Bureau of Land Management Land Survey Plat Officially filed February 15, 1985. Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 46 - Blubber Dump Debris\BlubberDump_PropDescription_Fig2.mxd Date: 4/24/2008 @ 1:42:43 PM

Pribilof Islands Restoration Project

5 of 5
2008-000212-0

NOAA Site 47
NTPA: Petroleum Contaminated Stockpile (Blubber Dump PCS removal and Polovina Hill Stockpile)

Final Closure Report, Blubber Dump/Enhanced Thermal Conduction Soil Treatment Facility, St. Paul Island, Alaska 1123

Letter from Louis Howard to John Lindsay RE: Draft Closure Report for Blubber Dump Enhanced Thermal Conduction Soil Treatment Facility Site 47, St. Paul Island dated October 1, 2004. Dated October 8, 2004 1153

Request for Conditional Closure, Polovina Hill Stockpile, non-TPA Site 47, St. Paul Island, Alaska 1155

Final Closure Report

Blubber Dump/Enhanced Thermal Conduction Soil Treatment Facility
St. Paul Island, Alaska

October 22, 2004

Prepared For:
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE
Seattle, Washington 98115

Prepared By:
Tetra Tech EM Inc.
6100 219th St. SW, Suite 550
Mountlake Terrace, Washington 98043

CONTENTS

ACRONYMS AND ABBREVIATIONS 1126
EXECUTIVE SUMMARY 1127
1.0 INTRODUCTION 1127
2.0 SITE DESCRIPTION 1128
2.1 SITE BACKGROUND 1128
2.2 SITE GEOLOGY 1129
2.3 SITE HYDROGEOLOGY 1129
3.0 CLOSURE STANDARDS 1129
4.0 FIELD ACTIVITIES 1129
4.1 CONTRACTORS AND EQUIPMENT 1130
4.2 CLOSURE ACTIVITIES 1130
4.3 SOIL STOCKPILING 1131
4.4 INVESTIGATION-DERIVED WASTE MANAGEMENT 1131
4.5 SITE SURVEYING 1131
5.0 FIELD SCREENING AND ANALYTICAL SAMPLING 1132
5.1 THIN-LAYER CHROMATOGRAPHY SCREENING SAMPLES 1132
5.2 CONFIRMATION SAMPLES 1132
5.3 STOCKPILE SAMPLES 1133
6.0 ANALYTICAL RESULTS 1133
6.1 CONFIRMATION SAMPLES 1133
6.2 STOCKPILE SAMPLES 1134
7.0 QUALITY ASSURANCE AND QUALITY CONTROL 1134
7.1 FIELD PROCEDURES 1134
7.1.1 Field Screening Procedures 1134
7.1.2 Sampling Procedures 1134
7.1.3 Equipment Decontamination 1134
7.1.4 Sample Control Procedures 1134
7.1.5 Documentation 1135
7.2 ANALYTICAL PROCEDURES 1135
7.2.1 Trip Blanks 1135
7.2.2 Equipment Rinsate Blanks 1135
7.2.3 Field Duplicate Samples 1135
7.2.4 Matrix Spike and Matrix Spike Duplicates 1135
7.2.5 Laboratory Quality Assurance and Control 1136
7.3 OBJECTIVES AND RESULTS 1136
7.3.1 Data Precision 1136
7.3.2 Data Accuracy 1136
7.3.3 Data Representativeness 1136
7.3.4 Data Completeness 1137

7.3.5 Comparability 1137
7.3.6 Usability 1137
8.0 CONCEPTUAL SITE MODEL 1137
8.1 HISTORICAL SOURCES OF CONTAMINATION 1137
8.2 RELEASE MECHANISMS 1137
8.3 IMPACTED MEDIA 1137
8.4 MIGRATION PATHWAYS 1138
8.5 EXPOSURE ROUTES 1138
8.6 POTENTIAL RECEPTORS 1138
8.7 CUMULATIVE RISK ASSESSMENT 1138
9.0 CONCLUSIONS AND RECOMMENDATIONS 1138
9.1 CONCLUSIONS 1138
9.2 RECOMMENDATION 1138
10.0 REFERENCES 1139

TABLES

Table

3-1 Soil Cleanup Levels
5-1 Analytical Data Summary – BTEX, GRO, DRO, and RRO
5-2 Analytical Data Summary – Polynuclear Aromatic Hydrocarbons

FIGURES

Figure

1-1 St. Paul Island Vicinity Map
1-2 Site Location Map
4-1 Site Map
4-2 Sampling Location Map (2003)
4-3 Sampling Location Map (2004)

APPENDICES

A Photographic Documentation
B Daily Reports and Logbook Notes
C 2003 Characterization and Remediation Data
D ADEC Approval Letter for Draft Closure Report

ACRONYMS AND ABBREVIATIONS

18 AAC	Title 18 *Alaska Administrative Code*
ADEC	Alaska Department of Environmental Conservation
bgs	Below ground surface
BSE	Bering Sea Eccotech, Inc.
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
cm	Centimeter
COC	Chain of custody
CSM	Conceptual site model
CY	Cubic yard
DRO	Diesel-range organic compounds
EPA	U.S. Environmental Protection Agency
ETC	Enhanced Thermal Conduction
GIS	Geographic information system
GPS	Global positioning system
GRO	Gasoline-range organic compounds
IDW	Investigation-derived waste
KRI	Kelly-Ryan, Inc.
LCS	Laboratory control sample
mg/kg	Milligram per kilogram
mL	Milliliter
MS/MSD	Matrix spike and matrix spike duplicate
NOAA	National Oceanic and Atmospheric Administration
PAH	Polynuclear aromatic hydrocarbon
PCS	Petroleum-contaminated soil
QAP	Quality assurance plan
QA/QC	Quality assurance and quality control
RPD	Relative percent difference
RRO	Residual-range organic compounds
Tetra Tech	Tetra Tech EM Inc.
TDX	Tanadgusix Corporation
TLC	Thin-layer chromatography
TPA	Two-Party Agreement
UST	Underground storage tank

EXECUTIVE SUMMARY

This closure report was prepared for the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA). The report details closure activities conducted for the Enhanced Thermal Conduction soil treatment system at the site locally known as the Blubber Dump on St. Paul Island, Alaska. Activities associated with this site were conducted during the 2003 and 2004 field seasons.

The Blubber Dump is situated in the southern portion of St. Paul Island, approximately 0.15 mile northwest of the Salt Lagoon and approximately 1.1 miles north of the City of St. Paul. In 1994, a long-term stockpile for petroleum-contaminated soil (PCS) was constructed at the Blubber Dump using geotextile material and a plastic liner. PCS generated during various corrective actions, including that conducted at the St. Paul Island Diesel Seep, was staged at the Blubber Dump. Subsequently, it was determined that the long-term stockpile had been inadvertently constructed on land owned by the Tanadgusix Corporation, instead of on federal land as was intended. In 2000, NOAA began operating an Enhanced Thermal Conduction (ETC) soil treatment system at the Blubber Dump to treat approximately 5,000 cubic yards (CY) of PCS. Due to high operating costs, use of the ETC treatment system was discontinued. During the fall of 2003, NOAA conducted site closure activities to remove remaining PCS and affected media.

Tetra Tech EM Inc. was selected by NOAA to implement the site closure plan for the removal of PCS remaining at this site. During closure activities conducted in the 2003 field season, a total of approximately 7,281 CY of PCS were removed from the Blubber Dump and transported to a PCS stockpile located at Tract 42. This total includes approximately 5,571 CY of PCS staged at the Blubber Dump prior to 2003 as well as approximately 250 CY of PCS removed from Site 19/Two-Party Agreement Site (TPA) 9d (West Dock Fuel Transfer Facility), 300 CY of PCS removed from Site 51/TPA Site 9p (Decommissioned Power Plant Annex), and 1,160 CY of PCS removed from Site 50/TPA Site 9o (Former Gasoline/Diesel Drum Storage Area) during the 2003 field season.

PCS was removed from the Blubber Dump in the areas of the stockpile and the former ETC treatment system as well as the surrounding vicinity. Analytical data for confirmation samples indicated that concentrations of diesel range organic compounds remained in two localized areas at concentrations above cleanup levels established by the Alaska Department of Environmental Conservation (ADEC). In July 2004, additional excavation was conducted at the Blubber Dump to remove remaining PCS from these localized areas. As a result, an additional 12 CY of PCS were removed and transported to the PCS stockpile located at Tract 42. Subsequently, analytical data for confirmation samples revealed that concentrations of contaminants were below ADEC cleanup levels.

Because all PCS has been removed and analytical data confirm that concentrations of contaminants are below cleanup levels, NOAA should request a no further remedial action planned determination from ADEC for the Blubber Dump.

1.0 INTRODUCTION

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) Pribilof Project Office is responsible for site characterization and restoration on St. Paul Island, Alaska. Public Law 104-91 of 1996 and Public Law 106-562 of 2000 provide the mandate for these activities. A Two-Party Agreement (TPA), signed in 1996 by NOAA and the State of Alaska, provides the framework for corrective action on St. Paul Island (NOAA 1996). The State of Alaska provides TPA oversight through the Alaska Department of Environmental Conservation (ADEC). Under the TPA, NOAA is required to comply with State of Alaska regulations that were in effect in 1991 (ADEC 1991); however, with ADEC agreement, NOAA has chosen to follow more current regulations whenever possible.

St. Paul Island is located north of the Aleutian Island chain in the Bering Sea, approximately 800 miles west-southwest of Anchorage, Alaska (see Figure 1-1). The site locally known as the Blubber Dump is situated in the southern portion of St. Paul Island, approximately 0.15 mile northwest of the Salt Lagoon and 1.1 miles north of the City of St. Paul (see Figure 1-2). NOAA has designated the Blubber Dump as Site 47.

Tetra Tech EM Inc. (Tetra Tech) was selected by NOAA to implement a site closure plan (NOAA 2003a) for the removal of stockpiled petroleum-contaminated soil (PCS)and PCS associated with the operation of an Enhanced Thermal Conduction (ETC) soil treatment system at this site, and subsequently, to prepare this closure report. Tetra Tech subcontracted Kelly-Ryan, Inc. (KRI) and Bering Sea Eccotech, Inc. (BSE) to provide the personnel and equipment necessary to implement the requirements of the site closure plan. The removal activities were completed under the oversight of Tetra Tech and in accordance with the site closure plan, the TPA, and State of Alaska regulations and guidance.

Closure activities were performed to address environmental impacts resulting from past operations conducted at the Blubber Dump.

The objectives of these closure activities, as outlined in the site closure plan (NOAA 2003a), were as follows:

- Relocation of PCS from the Blubber Dump to NOAA's temporary stockpile on Tract 42, adjacent to the St. Paul Landfill.
- Removal of the 20-mil plastic liner on which PCS was stockpiled at the Blubber Dump.
- Removal of the steel plate footprints from the ETC soil treatment system previously located at the Blubber Dump.
- Removal of miscellaneous debris.
- Collection of confirmation samples for fixed laboratory analyses.
- Restoration of the site to grade.
- Incorporation of site features and sampling locations into a geographic information system (GIS) database.
- Reporting of closure activities and results to ADEC.

Except as noted in this closure report, field activities for this investigation were carried out in accordance with the following documents:

- Site Closure Plan for the Blubber Dump (NOAA 2003a)
- Master Quality Assurance Plan (QAP) (NOAA 2003b)
- Master Health and Safety Plan (NOAA 2003c)
- Master Investigation-Derived Waste (IDW) Plan (NOAA 2003d)

2.0 SITE DESCRIPTION

The following subsections provide a description of the site background, site geology, and site hydrogeology for the Blubber Dump.

2.1 SITE BACKGROUND

In 1994, a long-term PCS stockpile was constructed adjacent to a former seal blubber dump using geotextile material and a 20-mil plastic liner. A 10- by 10-foot drainage sump was installed near the southwest corner of the stockpile to capture runoff. During the course of subsequent corrective actions on St. Paul Island, including at the St. Paul Island Diesel Seep Site and during various underground storage tank (UST) removals, PCS was transported to and staged at the Blubber Dump stockpile. Following initial staging of PCS at the Blubber Dump stockpile, it was determined that the stockpile had been inadvertently constructed on land owned by Tanadgusix Corporation (TDX) instead of on land owned by the federal government as was intended.

In 2000, NOAA began operating an ETC system at the Blubber Dump just west of the stockpile location to treat the PCS. The ETC system included three treatment cells. Approximately 6,000 cubic yards (CY) of PCS were successfully treated using the ETC system before the operating costs were determined to be too high, and use of the system was discontinued. Consistent with Title 18 of the *Alaska Administrative Code* (18 AAC) Chapter 75.365 (ADEC 2003a), and because treatment operations are complete, NOAA is required to remediate environmental pollution remaining at the site and restore the land.

2.2 SITE GEOLOGY

St. Paul Island was formed as a result of volcanic eruptions of basaltic lavas onto the southern edge of the Bering Sea Shelf. The island has never been glaciated, and many cinder cones with steep slopes and sharp crater rims are present on the island. The island soil is characterized as primarily volcanic deposits consisting of scoria of varying sizes (pebbles to cobbles) and colors (lenses of gray, red, and black) with fractured basalt occurring at depth (Barth 1956).

The Blubber Dump is located in a primarily sand dune environment and is heavily scoured by wind. As such, soils in the vicinity generally consist of sand. Depth to bedrock is not known (NOAA 2003a).

2.3 SITE HYDROGEOLOGY

Groundwater in the vicinity of the Blubber Dump is present at approximately 95 feet below ground surface (bgs) (NOAA 2003a).

3.0 CLOSURE STANDARDS

The TPA allows NOAA to apply cleanup levels using the methods described in the 1991 non-UST regulations (ADEC 1991); however, with ADEC approval, NOAA has elected to use current regulations (ADEC 2003a) to address soil cleanup. The cleanup methods applied by NOAA were presented in the site closure plan for the Blubber Dump. Four different methods are available to determine soil cleanup levels at petroleum-contaminated sites in accordance with the current State of Alaska Oil and Hazardous Substances Pollution Control Regulations (18 AAC 75). Method One involves the use of Table A1 of 18 AAC 75.341(a) to calculate a cleanup level and can only be applied to sites where the groundwater does not contain hazardous substances associated with the site. Method Two, discussed at 18 AAC 75.341(c), employs two separate tables including one for individual contaminants (Table B1) and one for petroleum hydrocarbon contaminants (Table B2). Method Three, discussed at 18 AAC 75.340(e), allows substitution of site-specific data for selected parameters used in the Method Two equations. Method Four, discussed at 18 AAC 75.340(f), requires the development and subsequent ADEC approval of a site specific risk assessment (ADEC 2003a, 2003b).

Because groundwater contamination is not suspected beneath the Blubber Dump, Method One was selected for the determination of closure standards for the contaminants of concern: diesel-range organic compounds (DRO); gasoline-range organic compounds (GRO); and residual-range organic compounds (RRO). Table 3-1 provides the Method One cleanup levels for DRO, GRO, and RRO at the Blubber Dump, which are consistent with the evaluation of cleanup levels found in Section 3.0 of the ADEC-approved site closure plan (NOAA 2003a). As required under 18 AAC 75.341, Table 3-1 also provides the Method Two cleanup levels for benzene, toluene, ethylbenzene, and total xylenes (BTEX).

4.0 FIELD ACTIVITIES

The following subsections summarize the equipment used and the activities performed during closure activities. Appendix A provides photographic documentation of closure activities. Appendix B provides copies of the daily reports as well as logbook notes generated during closure activities.

4.1 CONTRACTORS AND EQUIPMENT

Tetra Tech provided overall site management and engineering services including the direction of excavation activities and the collection of thin-layer chromatography (TLC) screening and confirmation samples during implementation of the site closure plan. Tetra Tech subcontracted KRI, BSE, and the City of St. Paul to provide the personnel and equipment, including excavators, loaders, and dump trucks necessary to implement requirements of the site closure plan. NOAA also furnished several pieces of government-owned equipment for use during closure activities. Health and safety meetings were conducted before the commencement of each day's activities. NOAA representatives conducted TLC analyses of screening samples on the island and provided survey support using real-time kinematic global positioning system (GPS) techniques and equipment. Laboratory analytical services were subcontracted to Friedman & Bruya, Inc. (Seattle, Washington).

Equipment used on site during field activities included the following:

- Caterpillar D5 Bulldozer (NOAA)
- Caterpillar D8 Bulldozer (KRI)
- Caterpillar 320 Excavator (NOAA)
- Hitachi EX-350 Excavator (KRI)
- Caterpillar 988 Loader (KRI)
- Caterpillar 992 Loader (KRI)
- Michigan L70 Loader (BSE)
- Volvo L70 Loader (BSE)
- Bell 25B 20-CY Dump Trucks (2) (KRI)
- Caterpillar 773 40-CY Dump Truck (KRI)
- DJB 30-CY Dump Truck (KRI)
- International 12-CY Dump Truck (BSE)
- Kenworth 12-CY Dump Truck (City of St. Paul)
- Kenworth 14-CY Dump Truck (NOAA)
- Trimble Total Station® 5700 GPS (NOAA)
- Low Boy Trailer (City of St. Paul)

4.2 CLOSURE ACTIVITIES

During the 2003 field season, closure activities for the Blubber Dump commenced on October 9, 2003, and were completed on November 1, 2003. The plastic liner covering the top of the Blubber Dump PCS stockpile was removed and containerized for future disposal off-island with other miscellaneous debris (see Figure 4-1). Subsequently, KRI loaded and transported PCS from this stockpile to the stockpile located at Tract 42. The plastic liner beneath the former Blubber Dump PCS stockpile was excavated along with PCS and placed in the stockpile located at Tract 42. After removing the PCS and bottom liner, KRI utilized a bulldozer to remove a 6-inch layer of visibly stained soil beneath the removed stockpile.

Activities conducted in the area of the former ETC treatment system included removal of the steel plates that supported and insulated the treatment system from the soil underneath. BSE removed the plates and initiated excavation activities beneath the north treatment cell (see Figure 4-2). However, upon inspection and analysis of TLC screening samples, it was determined that concentrations of contaminants in this area were already below cleanup levels, and further excavation activities were not necessary.

Approximately 300 CY of soil, removed from beneath the former Blubber Dump PCS stockpile and from the area of the north cell of the former ETC treatment system, were placed in a temporary stockpile located in the northwest portion of the former Blubber Dump PCS stockpile (see Figure 4-2).

Subsequently, BSE began clearing the site of miscellaneous items, including large boulders. BSE also removed eight drums that were staged at the site during previous corrective actions. Three drums contained diesel fuel, three drums contained contaminated water, and two drums were empty; the diesel fuel was used on-island in an oil burner while the contaminated water was emptied onto the PCS stockpile at Tract 42.

During closure activities conducted in the 2003 field season, a total of approximately 7,281 CY of PCS were removed from the Blubber Dump and transported to the PCS stockpile location at Tract 42. This total includes approximately 5,571 CY of PCS staged at the Blubber Dump prior to 2003 as well as approximately 250 CY of PCS removed from Site 19/Two-Party Agreement Site (TPA) 9d (West Dock Fuel Transfer Facility), 300 CY of PCS removed from Site 51/TPA Site 9p (Decommissioned Power Plant Annex), and 1,160 CY of PCS removed from Site 50/TPA Site 9o (Former Gasoline/Diesel Drum Storage Area).

In July 2004, an additional 12 CY of PCS were removed from two localized "hot spots" at the Blubber Dump based on analytical data for confirmation samples collected during the 2003 field season indicating DRO concentrations above the ADEC Method One cleanup level of 1,000 mg/kg following initial removal activities (see Figure 4-3). This PCS was also transported to the PCS stockpile located at Tract 42. In addition, the temporary stockpile of approximately 300 CY of soil, which had been removed during the 2003 field season, was placed, compacted, and graded in the area of the north cell of the former ETC treatment system based on analytical data that indicated concentrations of contaminants below cleanup levels.

4.3 SOIL STOCKPILING

No stockpile samples were collected from the former Blubber Dump PCS stockpile because this material was already characterized during previous corrective actions. A summary of stockpile activities conducted during the 2003 field season has been provided under separate cover (Tetra Tech 2004). A total of 9 samples were collected from soil placed in the temporary stockpile located at the northwest corner of the former Blubber Dump PCS stockpile (see Figure 4-2); these samples were analyzed for BTEX, GRO, DRO, RRO, and select polynuclear aromatic hydrocarbons (PAH). Based on analytical data, the temporary stockpile was determined to be uncontaminated, and was placed, compacted, and graded in the area of the north cell of the former ETC treatment system.

4.4 INVESTIGATION-DERIVED WASTE MANAGEMENT

IDW generated during this corrective action included:

- Used nitrile sampling gloves, which were placed in trash bags and disposed as municipal solid waste.
- Plastic bags and glassware, which were emptied of soil and disposed as municipal solid waste.
- Soil not extracted during TLC screening sample analyses, which was disposed in the PCS stockpile located at Tract 42.
- Spent methylene chloride and small vials of soil that had been extracted using methylene chloride for TLC screening sample analyses, which were containerized in glass jars and placed in lab pack containers for future off-island disposal as hazardous waste; these materials are currently awaiting disposal.
- Silica gel plates that had been spotted with methylene chloride during TLC screening sample analyses, which were containerized in plastic jars and will be placed in lab pack containers for future off-island disposal as hazardous waste; these materials are currently awaiting disposal.

4.5 SITE SURVEYING

Sampling locations, benchmarks, and excavation extents were surveyed by NOAA representatives using a survey-grade Trimble Total Station® 5700 differential GPS. The Trimble Total Station® 5700 is a GPS and GIS data collection and mapping system that combines a high performance, dual-channel GPS receiver and antenna with a local base station and real-time differential correction system to provide survey-grade accuracy in real time. Horizontal positions of soil sampling locations and excavation boundaries were determined to be within approximately plus or minus 1 centimeter (cm), and elevations were determined to within approximately plus or minus 2 cm.

A repeater radio was placed on Village Hill to provide radio transmission from the base station to the site location. Data were collected in latitude and longitude referenced to the World Geodetic System 84 Datum, Universal Transverse Mercator Zone 2 coordinate system in meters.

5.0 FIELD SCREENING AND ANALYTICAL SAMPLING

Throughout closure activities, Tetra Tech collected analytical confirmation samples in accordance with the site closure plan (NOAA 2003a), 18 AAC 78 (ADEC 2003b), and the ADEC UST procedures manual (ADEC 2002a). TLC screening samples, though not included in the site closure plan (NOAA 2003a), were used to direct excavation activities in the area of the former ETC treatment system. Analytical confirmation sampling locations were selected using a grid system established at the site with 25-foot spacing within the areas of the former Blubber Dump PCS stockpile and the former ETC treatment system areas, and 50-foot spacing in the surrounding vicinity. Locations with the greatest potential for residual contamination, including the drainage sump at the southwest corner of the stockpile, were also selected for discretionary sampling.

The following subsections describe the instrumentation used and procedures followed during the collection of TLC screening and analytical confirmation samples.

5.1 THIN-LAYER CHROMATOGRAPHY SCREENING SAMPLES

TLC involves the use of solid-liquid chromatography for the semi-quantitative analysis of diesel fuel hydrocarbons in soil. This analytical method, designed by NOAA, was originally used in support of field efforts during a crude oil spill in the state of Washington (NOAA 2002).

The procedure involves the extraction of screening samples in a field laboratory and subsequent comparison of the extracts to a range of standard diesel concentrations. By using standards that include diesel concentrations equal to, above, and below site-specific cleanup levels, the analyst is able to determine whether the sample contains concentrations above or below the site cleanup level; in addition, the analyst is able to determine an approximate concentration of DRO in each sample.

TLC screening samples were collected by placing a small amount of soil (approximately 20 grams) into a clean, resealable plastic bag. Each sample was homogenized and kept cool until it could be processed at the NOAA field laboratory. TLC samples were collected only from the excavation in the area of the north cell of the former ETC treatment system to characterize soil above the liner, but below the steel plates that were removed from this area.

5.2 CONFIRMATION SAMPLES

Confirmation samples were collected for fixed laboratory analyses to verify concentrations of contaminants remaining in soil to support closure of the site. Many of the confirmation samples, especially those along the perimeter of the site and in the southern two-thirds of the former ETC treatment system, were collected from locations where no soil was disturbed (see Figure 4-2). All confirmation samples were collected from a depth of 6 inches bgs in accordance with Section 4.4 of the ADEC-approved site closure plan (NOAA 2003a) and sampling methods included in the Master QAP (NOAA 2003b). Although sampling procedures deviated from the master QAP by using 25 grams of soil instead of 10 grams for BTEX and GRO analyses, as called for in the master QAP, these procedures are consistent with those described in analytical method AK101 as well as those recommended by the ADEC-approved laboratory performing the analyses. Confirmation samples were packaged and shipped to Friedman & Bruya, Inc. (Seattle, Washington) using the U.S. Postal Service Express Mail for the following analyses:

- GRO by Method AK101
- DRO by Method AK102
- RRO by Method AK103

In accordance with the site closure plan (NOAA 2003a), the following analyses were also conducted on all samples collected from the area of the former ETC treatment system and on five percent of the samples collected from the area of the former Blubber Dump PCS stockpile and surrounding vicinity:

- BTEX by U.S. Environmental Protection Agency (EPA) SW-846 (EPA 1996) Method 8021B

During the 2003 field season, 78 closure confirmation samples were collected during closure activities at the Blubber Dump. This total includes 25 soil samples from the area of the former ETC system, 42 soil samples from the area of the former Blubber Dump PCS stockpile, and 11 soil samples from the surrounding vicinity. In addition, eight field duplicate samples were collected. No confirmation samples were collected from beneath the temporary stockpile located in the northwest portion of the former Blubber Dump PCS stockpile.

In July 2004, a total of four confirmation samples were collected from the two localized "hot spots" following additional removal of PCS.

Tables 5-1 and 5-2 provide a summary of the confirmation samples collected from the Blubber Dump. Figures 4-2 and 4-3 illustrate the sampling locations.

5.3 STOCKPILE SAMPLES

A summary of stockpile activities conducted during the 2003 field season has been provided under separate cover (Tetra Tech 2004). Although stockpile samples were not anticipated under the site closure plan, site conditions initially warranted the removal of soil from beneath the area of the former ETC treatment system and from beneath the liner at the former Blubber Dump PCS stockpile. As a result, approximately 300 CY of soil were removed and staged in a temporary stockpile in the northwest portion of the former Blubber Dump PCS stockpile (see Figure 4-2). Based on TLC screening sample analyses, no further excavation was required at the former ETC treatment system.

Nine samples were collected from the temporary stockpile. In accordance with the ADEC UST procedures manual (ADEC 2002a), each of these samples was collected from a depth of 18 inches below the surface of the pile because the stockpile had been staged for longer than 1 hour. These samples were analyzed for BTEX, GRO, DRO, RRO, and select PAHs. For stockpile samples, BTEX and PAHs were added to the list of analyses based on consultation between Tetra Tech and NOAA representatives.

Based on analytical data, the temporary stockpile was subsequently placed, compacted, and graded in the area of the north cell of the former ETC treatment system in July 2004.

6.0 ANALYTICAL RESULTS

The following subsections summarize the analytical results for samples collected at the Blubber Dump. Tables 5-1 and 5-2 provide an analytical data summary for samples collected from this site. Appendix C provides a CD-ROM containing a digitized copy of the analytical data package for samples collected during the 2003 field season.

6.1 CONFIRMATION SAMPLES

Confirmation samples collected from the Blubber Dump after the removal action conducted during the 2003 field season indicated DRO concentrations that varied from not detected to 1,700 milligrams per kilogram (mg/kg); only 2 of the 78 samples collected from this area exceeded the ADEC Method One cleanup level of 1,000 mg/kg. The elevated concentrations of DRO were detected in samples SP47-CS-041-005 and SP47-CS-060-005, which were collected in two separate portions of the former Blubber Dump PCS stockpile area. Concentrations of GRO and RRO were below ADEC Method One cleanup levels. Concentrations of BTEX were below ADEC Method Two cleanup levels.

Confirmation samples collected in July 2004 from the two localized "hot spots" following additional removal of PCS indicated concentrations of contaminants below cleanup levels.

Laboratory reporting limits were below ADEC Method Two cleanup levels for all analyses except benzene. For benzene, reporting limits of 0.03 mg/kg or lower were achieved, which is below the soil cleanup level of 0.5 mg/kg.

6.2 STOCKPILE SAMPLES

No stockpile samples were collected from the former Blubber Dump PCS stockpile because this material was already characterized during previous corrective actions. A summary of stockpile activities conducted during the 2003 field season has been provided under separate cover (Tetra Tech 2004). Samples collected from the temporary stockpile contained DRO concentrations that varied from 20 mg/kg to 230 mg/kg.

7.0 QUALITY ASSURANCE AND QUALITY CONTROL

To ensure that information obtained from field and laboratory procedures is an accurate and defensible representation of site conditions, quality assurance and quality control (QA/QC) procedures were implemented. Tetra Tech followed the operational guidelines set forth in the ADEC UST procedures manual (ADEC 2002a) as well as those stipulated in the Pribilof Islands site restoration master QAP (NOAA 2003b). These documents provide detailed QA/QC information pertaining to each quality control item discussed in this section.

7.1 FIELD PROCEDURES

Several field QA/QC procedures were implemented to ensure sample integrity and the accurate representation of site conditions.

7.1.1 Field Screening Procedures

Field screening was conducted using the TLC field laboratory method. Quality control procedures for the TLC method included adherence to standard operating procedures (NOAA 2002) such as duplicate samples and verification of method standards. TLC samples were collected by placing a small amount of soil (approximately 20 grams) into a clean, resealable plastic bag and homogenizing it. The sample was then delivered to the on island NOAA representative for TLC screening analyses.

7.1.2 Sampling Procedures

Each soil sample was collected from freshly uncovered soil. A minimum of 6 inches of soil was removed from the surface of the sampling location before the sample was collected, consistent with the site closure plan. Each sample consisted of three containers. First, a small amount of soil (approximately 25 grams) was placed directly into a 4-ounce glass jar with septum; this container was then field extracted using 25 milliliters (mL) of methanol for GRO and BTEX analyses. Although sampling procedures deviated from the master QAP by using 25 grams of soil instead of 10 grams for GRO and BTEX analyses, as called for in the master QAP, these procedures are consistent with those described in analytical method AK101 as well as those recommended by the ADEC-approved laboratory performing the analyses. Second, at least 8 ounces of soil was homogenized in place; the two 4-ounce glass jars (no septa) were then filled with homogenized soil for DRO, RRO, and select PAH analyses (stockpile samples only).

7.1.3 Equipment Decontamination

All sampling equipment used during closure activities was disposable; therefore, decontamination of sampling equipment was not necessary.

7.1.4 Sample Control Procedures

Samples were collected in clean, resealable plastic bags (TLC screening samples) or sterile jars (confirmation samples) provided by the laboratory. After each sample was collected, the sample container was labeled with a unique sample identification number that was also recorded on the chain-of-custody (COC) form and in the field logbook. Sample containers were kept cool and in Tetra Tech custody until they were shipped directly to the

laboratory; TLC screening samples were also labeled with a unique sample identification number and given to the on-island NOAA representative for analyses. Confirmation samples were shipped on ice and in sealed, signed coolers. The appropriate COC forms accompanied each sample shipment to the laboratory.

7.1.5 Documentation

Field activities were documented in bound field logbooks. Field procedures, sample collection information, and sample identification information were recorded to ensure that samples were properly acquired, preserved, and identified in the field. TLC screening sample results were documented in bound laboratory notebooks as well as electronic spreadsheets.

7.2 ANALYTICAL PROCEDURES

Several analytical data QA/QC procedures were implemented during closure activities, both in the field and in the project laboratory, to ensure accurate representation of site conditions. Friedman & Bruya, Inc. (Seattle, Washington) conducted laboratory analyses for BTEX, GRO, DRO, RRO, and select PAHs. Friedman & Bruya, Inc. is an approved laboratory in accordance with 18 AAC 78.800.

7.2.1 Trip Blanks

Trip blanks are used to verify that contamination is not originating from sample containers or other external factor during sample transport. Trip blanks originate at the laboratory as 4-ounce glass jars with septa typically used for volatile organic compound analysis. The vials were filled at the laboratory with clean sand and were then transported to the site with the empty containers to be used for field sample collection. Trip blanks were stored at the site until the field samples had been collected. Each trip blank was extracted with 25 mL of methanol in the same manner as field samples and analyzed for GRO and BTEX. One trip blank accompanied each sample shipment to the laboratory.

7.2.2 Equipment Rinsate Blanks

Because all sampling equipment used during closure activities was disposable, rinsate blanks were not applicable to this sampling project.

7.2.3 Field Duplicate Samples

Field duplicate samples are collected at a frequency of 1 for every 10 field samples and are analyzed to check sampling and analytical precision and representativeness. Field duplicate samples are collected at the same time and from the same source, and then submitted as separate, blind samples to the laboratory for analyses, consistent with the master QAP (NOAA 2003b).

During closure activities conducted in the 2003 field season, 78 confirmation samples, 9 stockpile samples, and 8 field duplicate samples were collected. DRO was detected in confirmation sample SP47-CS-053-005, but not in the field duplicate sample SP47-CS-053-250. No other target analytes were detected in the field duplicate pairs. No data were qualified because of duplicate results. The duplicate sample frequency was 9.2 percent, slightly less than the 10 percent goal for this site. This minor deviation from the planned goal does not impact data usability.

No field duplicate samples were collected in July 2004. However, the lack of field duplicate samples for this period of time does not impact data usability.

7.2.4 Matrix Spike and Matrix Spike Duplicates

Matrix spike and matrix spike duplicate (MS/MSD) samples were analyzed at a frequency of approximately 1 per 20 field samples to evaluate analytical accuracy. Samples were spiked in the laboratory to measure the efficiency of the analytical method's ability to recover target analytes from a particular sampling matrix. Percent recoveries were analyzed for each of the spiked analytes and used to evaluate the analytical accuracy. The relative percent difference (RPD) between the spiked samples was also calculated to evaluate analytical precision. MS/MSD samples were obtained from specified field samples indicated on the COC forms; no additional sample volume was required. Acceptable percent recoveries for each sample differ, depending on the analytical method used. In

the event that a sample displayed a percent recovery outside the allowable range, sample data in that particular analytical batch were flagged by the laboratory with a qualifier indicating the discrepancy. Flags are typically posted adjacent to the laboratory's reported value.

7.2.5 Laboratory Quality Assurance and Control

Laboratory QA/QC included laboratory duplicate samples used to measure data precision; laboratory control samples (LCS), surrogate standards, and method blanks used to evaluate data accuracy; and laboratory blank samples used to evaluate data representativeness.

7.3 OBJECTIVES AND RESULTS

The following subsections describe the objectives and results for precision, accuracy, representativeness, completeness, and comparability associated with analytical data for closure activities.

7.3.1 Data Precision

Precision is the degree of mutual agreement between individual measurements of the same property under similar conditions. Laboratory analytical precision is evaluated by analyzing laboratory duplicates, specifically MS/MSD sample pairs. The results of analyses for each MS/MSD pair were used to calculate an RPD for evaluating precision.

RPD values for MS/MSD sample pairs and LCS and LCS duplicate sample pairs were within laboratory and method specified control limits with the following exception:

- For DRO and RRO analyses, control limits for the MS/MSD sample pair associated with stockpile sample SP47-SS-901 were not applied for DRO because the percent recovery result of 150 percent was biased high and outside the specified control limits of 60 to 140 percent; the RPD value for DRO was also high and outside the specified control limit of 20 percent. As a result, the detected result for DRO was qualified as estimated (J).

7.3.2 Data Accuracy

A program of sample spiking was conducted to evaluate laboratory accuracy. This program included analysis of the MS/MSD samples, LCS or blank spikes, surrogate standards, and method blanks. MS/MSD samples were analyzed at a frequency of 5 percent. LCS or blank spikes were also analyzed at a frequency of 5 percent. Surrogate standards, where available, are added to every sample analyzed for organic constituents. The results of the spiked samples are used to calculate the percent recovery for evaluating accuracy.

Percent recovery values for the surrogate spike samples in this project were within laboratory control limits for all analyses.

7.3.3 Data Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represent the characteristics of a population, variations in a parameter at a sampling point, or an environmental condition that they are intended to represent. For this project, representative data were obtained through careful selection of sampling locations and analytical parameters. Representative data were also obtained through the use of proper sample collection and handling techniques to avoid interference and minimize contamination. Representativeness of data was also ensured through the consistent application of established field and laboratory procedures. Laboratory blank samples were evaluated for the presence of contaminants to aid in evaluating the representativeness of sample results.

7.3.4 Data Completeness

Completeness is a measure of the percentage of project-specific data that are valid. Valid data are obtained when samples are collected and analyzed in accordance with approved quality control procedures and when none of the quality control criteria that affect data usability are exceeded. When all data validation is completed, the percent completeness value is calculated by dividing the number of useable sample results by the total number of sample results obtained.

A completeness value of 100 percent was achieved for this project.

7.3.5 Comparability

Comparability expresses the confidence with which one data set can be compared with another. Comparability of data is achieved by consistently following standard field and laboratory procedures and by using standard measurement units in reporting analytical data. This project used standard procedures for both field and laboratory processes, and the units used to express sample results are reasonable for concentrations encountered. Data sets for this project are, therefore, deemed comparable.

7.3.6 Usability

Data quality was evaluated as part of a data quality evaluation process that resulted in the production of a data quality evaluation report, which is summarized here. Appendix C provides a CD-ROM containing a digitized copy of the analytical data package for samples collected during the 2003 field season.

The data quality evaluation report summarizes data quality findings and resulting impacts to the environmental data, and indicates whether data quality goals were met. Data qualifiers that resulted from the validation process are depicted on the analytical data tables. Although sampling procedures deviated from the master QAP by using 25 grams of soil instead of 10 grams for GRO and BTEX analyses, as called for in the master QAP, the data quality was improved because of increased sensitivity of the laboratory analyses for these compounds.

Overall, the analytical data for samples submitted for GRO, DRO, RRO, BTEX, and select PAHs are acceptable and usable without qualification. No data were rejected.

8.0 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is used to evaluate exposure pathways for human health and ecological receptors (ADEC 2000). The following subsections provide an evaluation for each of the elements of the CSM for the Blubber Dump, including historical contamination sources, release mechanisms, impacted media, migration pathways, exposure routes, potential receptors, and a cumulative risk assessment.

8.1 HISTORICAL SOURCES OF CONTAMINATION

Historical sources of contamination were removed during this clsoure and included the former Blubber Dump PCS stockpile.

8.2 RELEASE MECHANISMS

Potential release mechanisms included runoff from the former Blubber Dump PCS stockpile and migration to groundwater. However, based on TLC screening sample analyses and visual observation, it appears that contamination was limited to the upper 6 inches of soil.

8.3 IMPACTED MEDIA

PCS stockpiling activities at the Blubber Dump were conducted on lined areas and under controlled conditions. As such, the impacts on media at this site were minimal. During the 2003 and 2004 field seasons, PCS from the area of the former Blubber Dump PCS stockpile was relocated to Tract 42. No impacted media are present at the site.

8.4 MIGRATION PATHWAYS

Because PCS has been relocated to Tract 42, contamination associated with this site has been removed. As a result, migration pathways have been eliminated.

8.5 EXPOSURE ROUTES

Because PCS has been relocated, direct exposure pathways such as dermal contact with or incidental ingestion of PCS have been eliminated. In addition, groundwater contamination is unlikely because of the depth to water (95 feet bgs). No potable water production wells are located in the vicinity of the Blubber Dump, so exposure to potentially contaminated groundwater is highly unlikely.

8.6 POTENTIAL RECEPTORS

All PCS has been removed from this site; therefore, no receptors exist.

8.7 CUMULATIVE RISK ASSESSMENT

Cumulative risk is defined as the sum of risks resulting from multiple sources and pathways to which humans are exposed. When more than one hazardous substance is present at a site or multiple exposure pathways exist, the cleanup levels in Table B1 of 18 AAC 75.341 and Table C of 18 AAC 75.345 may need to be adjusted downward. In accordance with the requirements outlined in 18 AAC 78.600, NOAA must ensure that the cumulative cancer risk remaining after the completion of the corrective action does not exceed 1 in 100,000 (1×10^{-5}) and that the cumulative non-carcinogenic hazard index does not exceed 1.0. Each contaminant detected above one-tenth of the Table B1 inhalation or ingestion cleanup levels (excluding DRO, GRO, and RRO) must be included in cumulative risk calculations (ADEC 2002b).

No contaminants were detected in soil above one-tenth of the Table B1 cleanup levels. Therefore, based on these requirements, cumulative risk calculations are not required.

9.0 CONCLUSIONS AND RECOMMENDATIONS

The following subsections present conclusions and recommendations for the Blubber Dump based on field activities performed and analytical findings obtained during closure activities conducted during the 2003 field season.

9.1 CONCLUSIONS

During closure activities conducted in the 2003 field season, approximately 7,281 CY of PCS were removed from the Blubber Dump. In July 2004, an additional 12 CY of PCS were removed from two localized “hot spots” (sampling locations SP47-CS-041-005 and SP47-CS-060-005). Based on analytical data, concentrations of all contaminants were below the cleanup levels specified in Section 3.0 of this report. In addition, the temporary stockpile of approximately 300 CY of soil was determined to be uncontaminated and was placed, compacted, and graded in the area of the north cell of the former ETC treatment system based on analytical data.

9.2 RECOMMENDATION

Because all PCS has been removed, NOAA should request a no further remedial action planned determination from ADEC for the Blubber Dump.

10.0 REFERENCES

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels. Contaminated Sites Program*. July 17.

ADEC. 2000. *Risk Assessment Procedures Manual*. June 8.

ADEC. 2002a. *Underground Storage Tanks Procedures Manual, Guidance for Treatment of Petroleum-Contaminated Soil and Water and Standard Sampling Procedures*. State of Alaska. November 7.

ADEC. 2002b. *Cumulative Risk Guidance*. November 7.

ADEC. 2003a. 18 AAC 75, Articles 3 and 9. *Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. Amended through October 28.

ADEC. 2003b. 18 AAC 78. *Underground Storage Tanks*. State of Alaska. Amended through January 30.

Barth, T.F.W. (Barth). 1956. *U.S. Department of the Interior Geological Survey Bulletin 1028-F, Geology and Petrology of the Pribilof Islands, Alaska*.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two-Party Agreement, Attorney General's Office File No. 66-1-95-0126*. January 26.

NOAA. 2002. *Standard Operating Procedure for the Analysis of Soils and Sediments for Diesel-Range Organics by Thin Layer Chromatography*. September 5.

NOAA. 2003a. *Final Site Closure Plan for the Blubber Dump Petroleum-Contaminated Soil Stockpile Site, St. Paul Island, Alaska*. October 24.

NOAA. 2003b. *Master Quality Assurance Plan, Pribilof Islands Environmental Restoration Project*. April.

NOAA. 2003c. *Master Health and Safety Plan, Pribilof Islands Environmental Restoration Project*. April.

NOAA. 2003d. *Master Investigation-Derived Waste Plan, Pribilof Islands Environmental Restoration Project*. April.

Tetra Tech EM, Inc. 2004. *Letter Report, Summary of 2003 Field Season Stockpile Activities, St. Paul Island*. July 23.

U.S. Environmental Protection Agency. 1996. *Test Methods for Evaluating Solid Waste*. EPA/SW-846. Third Edition and Updates. December.

TABLES

Table 3-1. SOIL CLEANUP LEVELS, SITE 47/BLUBBER DUMP, ST. PAUL ISLAND, ALASKA

Analytical Parameter	Laboratory Method	Soil Cleanup Level (mg/kg)[a]
GRO	AK101	500
DRO	AK102	1,000
RRO	AK103	2,000
Benzene	EPA 8021B	0.5[b]
Ethylbenzene	EPA 8021B	5.5
Toluene	EPA 8021B	5.4
Xylenes, total	EPA 8021B	78

Notes:

ADEC Alaska Department of Environmental Conservation
BTEX Benzene, toluene, ethylbenzene, and total xylenes
DRO Diesel-range organic compounds
GRO Gasoline-range organic compounds
mg/kg Milligram per kilogram
NA Not applicable
RRO Residual-range organic compounds
a Cleanup levels are obtained from Title 18 of the *Alaska Administrative Code* 75, "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000. Contaminants of concern for this site are limited to BTEX, GRO, DRO, and RRO.
b Under the TPA, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg); however, NOAA has attempted to remove benzene to within the current ADEC Method Two cleanup level for benzene (0.02 mg/kg) when possible.

Table 5-1. Analytical Data Summary For Confirmation Samples - BTEX, GRO, DRO, and RRO, Site 47/Blubber Dump, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)
Site 47/Blubber Dump Confirmation Samples (2003 Field Season)								
Former ETC Treatment System								
SP47-CS-001-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	41	50 U
SP47-CS-002-005	0.5	0.03 U	0.03 U	0.03 U	0.06 U	2 U	10 U	50 U
SP47-CS-003-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	48	50 U
SP47-CS-004-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	40	50 U
SP47-CS-005-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U
SP47-CS-006-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U
SP47-CS-007-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	36	110
SP47-CS-008-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	38	50 U
SP47-CS-009-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	16	50 U
SP47-CS-010-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	18	50 U
SP47-CS-011-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U
SP47-CS-012-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U
SP47-CS-013-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	27	50 U

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)
SP47-CS-014-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	73	200
SP47-CS-015-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	37	83
SP47-CS-016-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	150	240
SP47-CS-017-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	150	520
SP47-CS-018-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	26	50 U
SP47-CS-019-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	76	50 U
SP47-CS-020-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	15	50 U
SP47-CS-021-005	0.5	0.03 U	0.03 U	0.03 U	0.09 U	2 U	10 U	50 U
SP47-CS-022-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	100	78
SP47-CS-023-005	0.5	0.02	0.02	0.02 U	0.06 U	1 U	240	160
SP47-CS-024-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	300	110
Former Blubber Dump PCS Stockpile								
SP47-CS-026-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-027-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-028-005	0.5	--	--	--	--	1 U	14	50 U
SP47-CS-029-005	0.5	--	--	--	--	1 U	280	50 U
SP47-CS-030-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	77
SP47-CS-030-250 [a]	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U
SP47-CS-031-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-032-005	0.5	--	--	--	--	2 U	18	50 U
SP47-CS-033-005	0.5	--	--	--	--	2 U	10 U	50 U
SP47-CS-034-005	0.5	--	--	--	--	2 U	10 U	50 U
SP47-CS-035-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	15	50 U
SP47-CS-036-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-037-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-038-005	0.5	--	--	--	--	2 U	16	50 U
SP47-CS-039-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-040-005	0.5	--	--	--	--	2 U	10 U	50 U
SP47-CS-041-005	0.5	--	--	--	--	1 U	**1,100**	170
SP47-CS-042-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U
SP47-CS-042-250 [b]	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U
SP47-CS-043-005	0.5	--	--	--	--	1 U	20	50 U
SP47-CS-044-005	0.5	--	--	--	--	2 U	31	50 U
SP47-CS-045-005	0.5	--	--	--	--	2	220	70
SP47-CS-046-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U
SP47-CS-046-250 [c]	0.5	0.03 U	0.03 U	0.03 U	0.09 U	2 U	10 U	50 U
SP47-CS-047-005	0.5	--	--	--	--	1 U	40	50 U
SP47-CS-048-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-049-005	0.5	--	--	--	--	1 U	210	130
SP47-CS-050-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-051-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U
SP47-CS-051-250 [d]	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)
SP47-CS-052-005	0.5	--	--	--	--	2 U	10 U	50 U
SP47-CS-053-005	0.5	0.03 U	0.03 U	0.03 U	0.09 U	2 U	40	50 U
SP47-CS-053-250 [e]	0.5	0.03 U	0.03 U	0.03 U	0.09 U	2 U	10 U	50 U
SP47-CS-054-005	0.5	--	--	--	--	2 U	10 U	50 U
SP47-CS-055-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-056-005	0.5	--	--	--	--	2 U	44	50 U
SP47-CS-057-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-058-005	0.5	0.03 U	0.03 U	0.03 U	0.09 U	2 U	10 U	50 U
SP47-CS-058-250 [f]	0.5	0.03 U	0.03 U	0.03 U	0.09 U	2 U	10 U	50 U
SP47-CS-059-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-060-005	0.5	--	--	--	--	3	**1,700**	310
SP47-CS-061-005	0.5	--	--	--	--	2 U	10 U	50 U
SP47-CS-062-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-063-005	0.5	0.03 U	0.03 U	0.03 U	0.09 U	2 U	10 U	50 U
SP47-CS-063-250 [g]	0.5	0.03 U	0.03 U	0.03 U	0.09 U	2 U	10 U	50 U
SP47-CS-064-005	0.5	--	--	--	--	2 U	10 U	50 U
SP47-CS-065-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-066-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-067-005	0.5	0.03 U	0.03 U	0.03 U	0.09 U	2 U	10 U	50 U
Surrounding Vicinity								
SP47-CS-025-005	0.5	0.03 U	0.03 U	0.03 U	0.09 U	2 U	10 U	50 U
SP47-CS-068-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-069-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-070-005	0.5	--	--	--	--	1 U	37	50 U
SP47-CS-071-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-072-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-073-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U
SP47-CS-073-250 [h]	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U
SP47-CS-074-005	0.5	0.03 U	0.06	0.03 U	0.09 U	2 U	17	50 U
SP47-CS-075-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-076-005	0.5	--	--	--	--	1 U	10 U	50 U
SP47-CS-077-005	0.5	--	--	--	--	1 U	67	180
SP47-CS-078-005	0.5	--	--	--	--	1 U	10 U	50 U
Site 47/Blubber Dump Confirmation Samples (2004 Field Season)								
"Hot Spot" Location SP47-CS-060-005								
SP47-CS-079-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U
SP47-CS-080-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U
"Hot Spot" Location SP47-CS-041-005								
SP47-CS-081-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U
SP47-CS-082-005	0.5	0.02 U	0.02 U	0.02 U	0.06 U	1 U	110	92

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)
Site 47/Blubber Dump Temporary Stockpile Samples								
SP47-SS-901	--	0.02 U	0.02 U	0.02 U	0.06 U	1 U	230 J	78
SP47-SS-902	--	0.08	0.22	0.04	0.24	3	210	50 U
SP47-SS-903	--	0.02 U	0.02 U	0.02 U	0.06 U	1 U	43	81
SP47-SS-904	--	0.02 U	0.02 U	0.02 U	0.06 U	1 U	30	50 U
SP47-SS-905	--	0.02 U	0.02 U	0.02 U	0.06 U	1 U	36	50 U
SP47-SS-906	--	0.02 U	0.02 U	0.02 U	0.06 U	1 U	31	50 U
SP47-SS-907	--	0.02 U	0.02 U	0.02 U	0.06 U	1 U	47	63
SP47-SS-908	--	0.02 U	0.02 U	0.02 U	0.06 U	1 U	33	63
SP47-SS-909	--	0.02 U	0.04	0.02 U	0.06 U	1 U	20	50 U
Trip Blank Samples								
Trip blank	--	0.02 U	0.02 U	0.02 U	0.06 U	1 U	NA	NA
Trip blank	--	0.02 U	0.02 U	0.02 U	0.06 U	1 U	NA	NA
Trip blank	--	0.02 U	0.02 U	0.02 U	0.06 U	1 U	NA	NA
ADEC Method One Cleanup Level [I]		*0.5* [j]	*5.4* [k]	*5.5* [k]	*78* [k]	*500*	*1,000*	*2,000*

Notes

bold Indicates concentration above cleanup level. Although reporting limits for benzene sometimes exceeded the ADEC Method Two cleanup level of 0.02 mg/kg, all reporting limits were below the cleanup level of 0.5 mg/kg consistent with the TPA.

ADEC Alaska Department of Environmental Conservation
bgs Below ground surface
BTEX Benzene, toluene, ethylbenzene, and total xylenes
DRO Diesel-range organic compounds
ETC Enhanced Thermal Conduction
GRO Gasoline-range organic compounds
mg/kg Milligram per kilogram
-- Not analyzed
NA Not available
RRO Residual-range organic compounds
TPA Two-Party Agreement
U The analyte was analyzed for, but not detected above the sample reporting limit
J The analyte was positively identified, but the numerical value is the estimated concentration; the result is considered qualitatively acceptable, but quantitatively unreliable
a Duplicate of sample number SP47-CS-030-005
b Duplicate of sample number SP47-CS-042-005
c Duplicate of sample number SP47-CS-046-005
d Duplicate of sample number SP47-CS-051-005
e Duplicate of sample number SP47-CS-053-005
f Duplicate of sample number SP47-CS-058-005
g Duplicate of sample number SP47-CS-063-005
h Duplicate of sample number SP47-CS-073-005
i Method One cleanup level obtained from Title 18 of the *Alaska Administrative Code* 75, "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000. Contaminants of concern for this site are limited to BTEX, GRO, DRO, and RRO.
j Under the TPA, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg).
k Method Two cleanup level obtained from Title 18 of the *Alaska Administrative Code* 75, "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000.

Table 5-2. Analytical Data Summary For Confirmation Samples - Polynuclear Aromatic Hydrocarbons, Site 47/ Blubber Dump, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Naphthalene (mg/kg)	Acenaph-thylene (mg/kg)	Acenaph-thene (mg/kg)	Fluorene (mg/kg)	Phenan-threne (mg/kg)	Anthracene (mg/kg)	Fluor-anthene (mg/kg)	Pyrene (mg/kg)
Site 47/Blubber Dump - Temporary Stockpile Samples									
SP47-SS-901	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP47-SS-902	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.009
SP47-SS-903	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP47-SS-904	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP47-SS-905	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP47-SS-906	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP47-SS-907	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.006
SP47-SS-908	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP47-SS-909	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Method Two Cleanup Level [a]		*43*	*NA*	*210*	*270*	*NA*	*4300*	*NA*	*1500*

Sample Number	Benz(a) anthracene (mg/kg)	Chrysene (mg/kg)	Benzo(b) fluoranthene (mg/kg)	Benzo(k) fluoranthene (mg/kg)	Benzo(a) pyrene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Dibenzo(a,h) anthracene (mg/kg)	Benzo(g,h,i) perylene (mg/kg)
Site 47/Blubber Dump - Temporary Stockpile Samples								
SP47-SS-901	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP47-SS-902	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP47-SS-903	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP47-SS-904	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP47-SS-905	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP47-SS-906	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP47-SS-907	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP47-SS-908	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP47-SS-909	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Method Two Cleanup Level [a]	*6*	*620*	*11*	*110*	*1*	*11*	*1*	*NA*

Notes

bgs Below ground surface
mg/kg Milligram per kilogram
NA Not available
U The analyte was analyzed for, but not reported above the sample reporting limit
a Cleanup level is obtained from Title 18 of the *Alaska Administrative Code* 75, "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000.

FIGURES

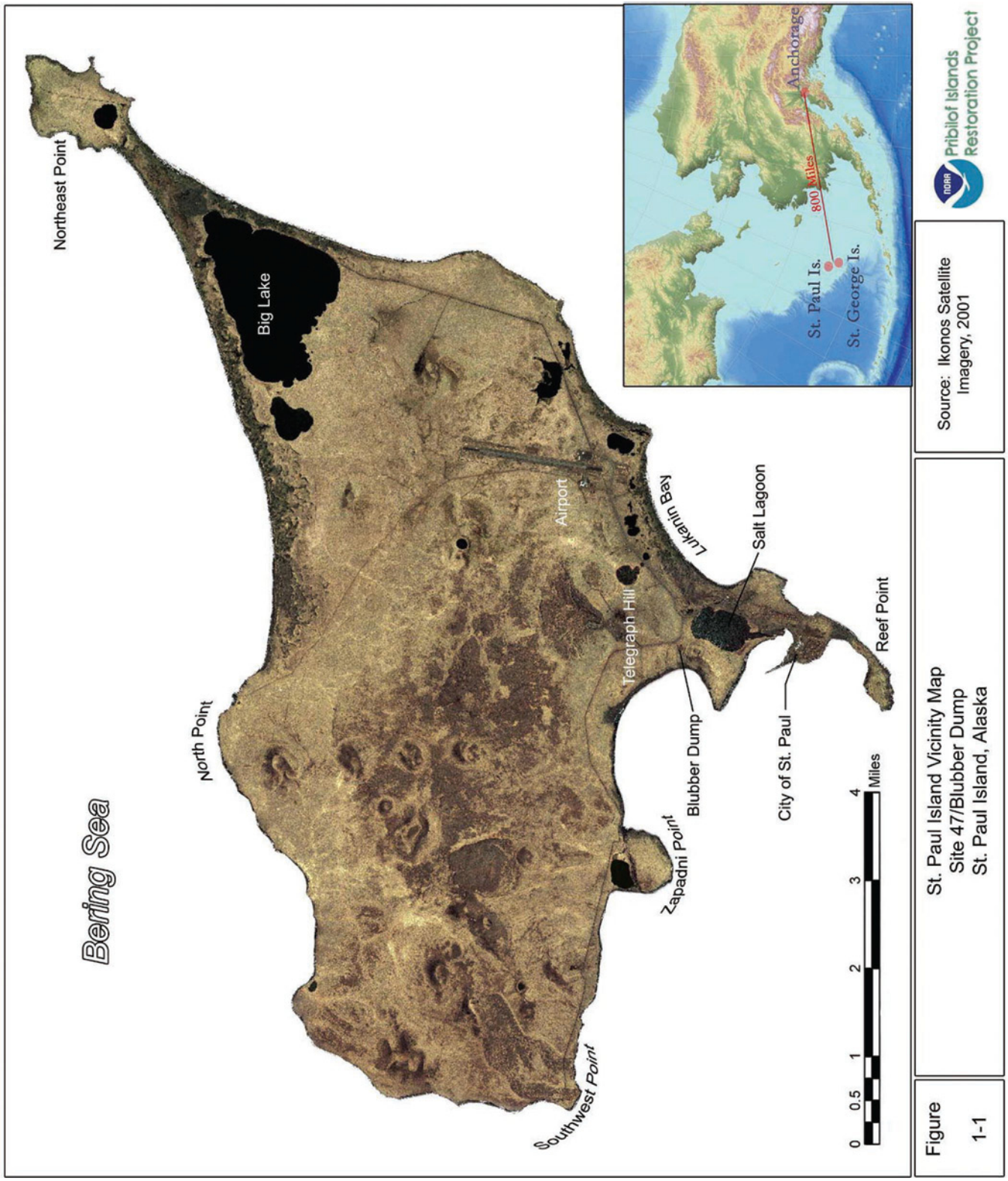

Bering Sea
Northeast Point
Big Lake
North Point
Southwest Point
Zapadni Point
Blubber Dump
Telegraph Hill
Airport
Lukanin Bay
Salt Lagoon
City of St. Paul
Reef Point
0 0.5 1 2 3 4 Miles
St. Paul Island Vicinity Map
Site 47/Blubber Dump
St. Paul Island, Alaska
Source: Ikonos Satellite Imagery, 2001
Anchorage
St. Paul Is.
St. George Is.
800 Miles
Pribilof Islands Restoration Project
Figure 1-1

Figure 1-2	Site Location Map Site 47/Blubber Dump St. Paul Island, Alaska	Source: Satellite Imagery (Ikonos, 2001).	Pribilof Islands Restoration Project

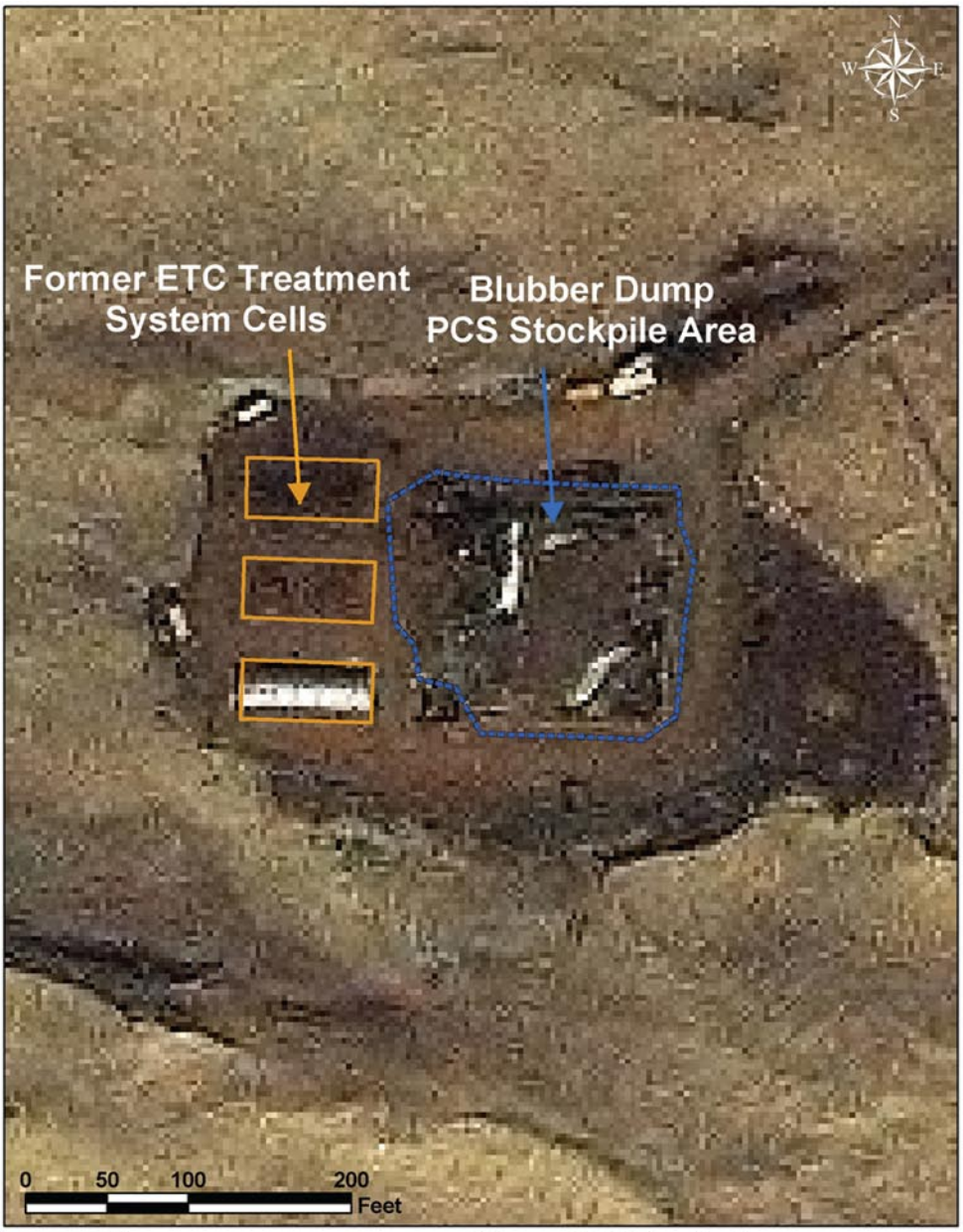


Figure 4-1	Site Map Site 47/Blubber Dump St. Paul Island, Alaska	Sources: ETC Cell Locations and PCS Stockpile Location (NOAA Pribilof GIS Project 2003), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

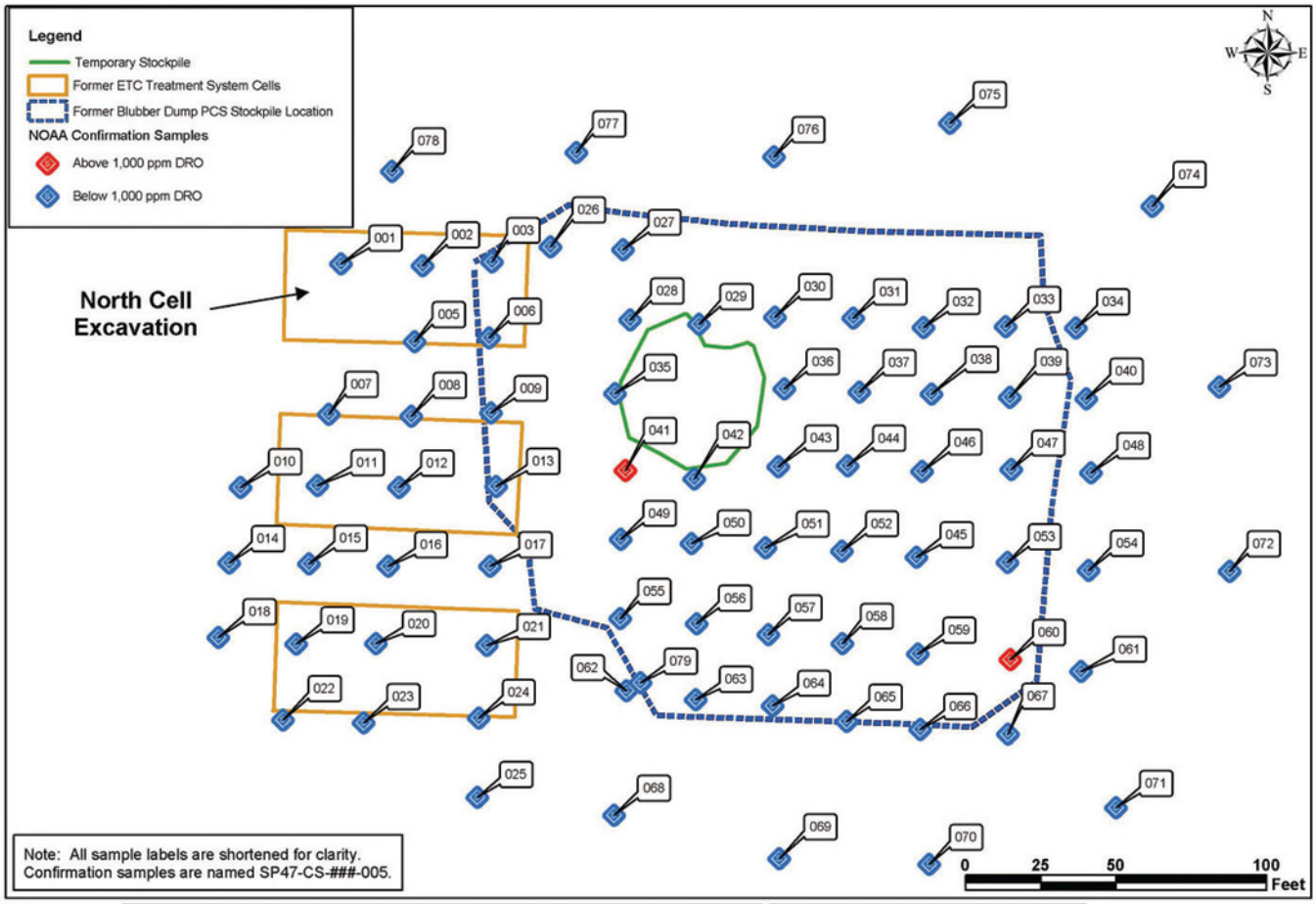


Figure 4-2

Sampling Location Map **(2003)**
Site 47/Blubber Dump
St. Paul Island, Alaska

Sources: ETC Cell Locations and Stockpile Locations (NOAA Pribilof Project GIS 2003), Confirmation Sample Locations (NOAA GPS 2003).

Pribilof Islands Restoration Project

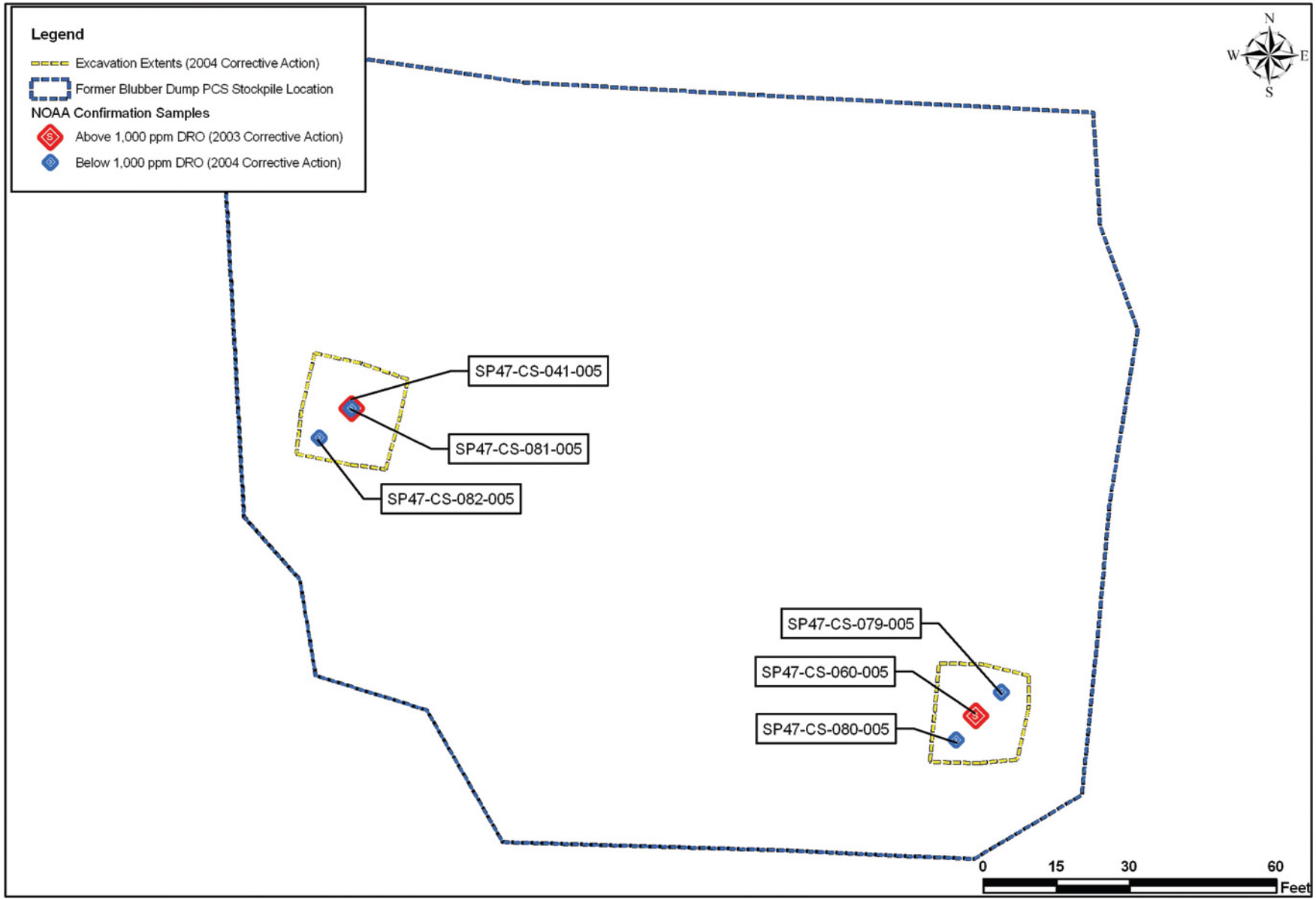


Figure 4-3

Sampling Location Map (2004)
Site 47/Blubber Dump
St. Paul Island, Alaska

Sources: Excavation Extents and Confirmation Sample Locations (NOAA GPS 2003/2004).

Pribilof Islands Restoration Project

APPENDIX A: Photographic Documentation

Photograph 1. Blubber Dump 17 October 2003
View of excavation activities at the Blubber Dump stockpile. Facing southwest.

Photograph 2. Blubber Dump 21 October 2003
View of excavation activities at the Blubber Dump stockpile. Facing southwest.

Photograph 3. Blubber Dump 11 November 2003
View of the Blubber Dump following completion of excavation activities. Facing northwest.

Photograph 4. Blubber Dump 11 November 2003
View of the Blubber Dump following completion of excavation activities. Facing north.

Photograph 5. Blubber Dump 11 November 2003
View of the Blubber Dump following completion of excavation activities. Facing northeast.

Photograph 6. Blubber Dump 11 November 2003
View of the Blubber Dump following completion of excavation activities. Facing northeast.

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

FRANK H. MURKOWSKI, GOVERNOR
555 Cordova Street
Anchorage, AK 99501
PHONE: (907) 269-7552
FAX: (907) 269-7649
http://www.state.ak.us/dec/home.htm

File No.: 2644.38.038

October 8, 2004

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-0070

RE: Draft Closure Report for Blubber Dump Enhanced Thermal Conduction Soil Treatment Facility Site 47, St. Paul Island dated October 1, 2004

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (the Department) received the above document on October 5, 2004 for review and comment. Based on a review of the data provided, the Department will grant a no further action planned determination for the Blubber Dump (Site 47). This determination is equivalent to certification by the Department that corrective action is complete under TPA section 59. Closure of Sites of Operable Units: "… NOAA may request from ADEC written confirmation that *all corrective action* has been completed at a site(s) or operable unit(s) in accordance with this Agreement. Within thirty (30) Days of its receipt of such request. ADEC shall: (1) provide written confirmation that no further corrective action is required at the subject site(s) or operable unit(s)."

The Department reserves all of its rights, under A.S. 46.03, 18 AAC 75, and 18 AAC 78 to require NOAA to conduct additional site assessment, remediation, and/or other necessary actions deemed appropriate by the Department, if information becomes available that contamination is present at Site 47 which poses an unacceptable risk to human health or safety, welfare, or the environment.

Please contact me with any questions or concerns directly at (907) 269-7552.

Sincerely,

Louis Howard
Project Manager

G:\SPAR\SPAR-CS\38 Case Files (Contaminated Sites)\2644 St. Paul Island\2644.38.038 NTPA Blubber Dump Debris\08-Oct-2004 draft Closure report Comments & NFRAP Approval.doc

Request for Conditional Closure
Polovina Hill Stockpile, non-TPA Site 47
St. Paul Island, Alaska

Request for Conditional Closure

Site: Polovina Hill stockpile, also known as non-Two Party Agreement (TPA) Site 47

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea (Figure 1). On the island, the Polovina Hill stockpile site is situated approximately seven miles northeast of the Village of St. Paul, at the southeastern base of Polovina Hill, and adjacent to the access road to the Polovina quarry (Figure 1 and 2). NOAA positioned the site on the hillside in order to afford some protection from the high winds common on St. Paul Island.

Global positioning system (GPS) coordinates are available for the four corners of one of the site's two stockpiles, the west pile.

NW Corner:	57 10 56.937 N Latitude170 11 08.116 W Longitude
NE Corner:	57 10 56.955 N Latitude170 11 07.207 W Longitude
SW Corner:	57 10 56.139 N Latitude170 11 08.025 W Longitude
SE Corner:	57 10 56.093 N Latitude170 11 07.404 W Longitude

Legal Property Description: The Polovina Hill stockpile site is within Township 35 South, Range 131 West, Section 3, of the Seward Meridian, Alaska, as shown on the plat of rectangular survey officially filed May 14, 1986 (Figure 2). The Tanadgusix Corporation (TDX) owns the surface estate, and The Aluet Corporation owns the subsurface estate of this site.

Type of Release: National Oceanic and Atmospheric Administration (NOAA) used this site as a long-term storage area for diesel and gasoline-contaminated soils. Contaminated soils were stockpiled on a liner and covered at the site.

History and Background:
During 1997, NOAA and its contractors removed underground storage tanks (USTs) from the former gas station, the decommissioned power plant, and the municipal garage on St. Paul Island. Petroleum-contaminated soils (PCS) from UST removal actions were stockpiled for long-term storage at an excavation on the slope of Polovina Hill. Stockpiled soils were segregated according to the type of contamination. Soil categorized as diesel-contaminated comprised a west stockpile, while soil categorized as gasoline-contaminated comprised an east stockpile (Figure 3; Photograph 1). NOAA constructed the stockpiles in accordance with Alaska Department of Environmental Conservation (ADEC) standards for long-term stockpiling (ADEC 1991). The soils were placed on a bottom liner and covered with a second liner (Photographs 1 and 2).

Estimates of the quantity of soil stockpiled at Polovina Hill vary. Aleutian Enterprises (1998) estimated the total volume of the east and west stockpiles at 777 cubic yards. Foster Wheeler Environmental Corporation (Foster Wheeler; 2001) estimated the volume of each individual stockpile at 1,500 cubic yards for a total volume of 3,000 cubic yards. UST removal and closure reports indicate that approximately 500 cubic yards of gasoline-contaminated soil were placed in the east stockpile, and approximately 416 cubic yards of diesel-contaminated soil were placed in the west stockpile (Bristol 1997). In 2002, NOAA using its survey grade GPS and geographic information system (GIS) estimated the west stockpile volume at 400 cubic yards and the footprint at 4,865 square feet.

Summary of Site Investigations:

Prior to placement of the stockpile liners at the Polovina Hill site, Aleutian Enterprises and Bristol Environmental Services Corporation (Bristol) collected five samples from the footprints, two from the west side and three from the east side. All findings were non-detect (Aleutian Enterprises 1998). Once the soil stockpiles were constructed, Aleutian Enterprises and Bristol collected 10 soil samples from the west stockpile and 14 from the east soil stockpile (Aleutian Enterprises 1998 and Bristol 1997). In the west stockpile, diesel range organics (DRO) ranged from 710 to 7,800 mg/kg and total benzene, toluene, ethylbenzene, and xylenes (BTEX) ranged from 0.25 to 23.7 mg/kg. In the east stockpile, gasoline-range organics (GRO) ranged from 57 to 2,400 mg/kg; DRO ranged from 83 to 3,500 mg/kg; and BTEX ranged from non-detect to 17 mg/kg.

Summary of Applied Cleanup Levels:

The methods for establishing soil cleanup levels for the Pribilof Restoration Project are described in the Two-Party Agreement (TPA; NOAA 1996). NOAA employed ADEC Method Two cleanup criteria, discussed in 18 Alaska Administrative Code (AAC) 75.341(c) (ADEC 2000). For benzene, under the TPA (NOAA 1996), NOAA had the option to cleanup to the less stringent State of Alaska cleanup level (0.5 mg/kg) in effect in 1991 (ADEC 1991).

Summary of Cleanup Actions:

In 2000, Foster Wheeler (2001) completely removed the east stockpile from the Polovina Hill site, relocating it to the Blubber Dump. Foster Wheeler treated 350 cubic yards of the soil in NOAA's enhanced thermal treatment (ETC) system (Foster Wheeler 2001). Soil samples collected following treatment did not contain detectable levels of GRO, DRO, residual range organics (RRO), or BTEX. The maximum concentration of lead detected was 11 mg/kg, well below the residential cleanup standard of 400 mg/kg lead. Foster Wheeler subsequently moved the remediated soil to the St. Paul landfill. Untreated soil remained at the Blubber Dump to await treatment and/or final disposition.

Foster Wheeler collected four confirmation samples following the removal of the east stockpile from the Polovina Hill site (Foster Wheeler 2001). No GRO, DRO, RRO, or BTEX was detected. The maximum concentration of lead detected was 1 mg/kg.

Bering Sea Eccotech (BSE) removed the west stockpile from the Polovina Hill site on July 8-10, 2002 (NOAA 2005a). BSE transported approximately 400 cubic yards of PCS to the Blubber Dump stockpile site to await thermal treatment. Subsequently, NOAA and BSE thermally treated the soil in NOAA's ETC system. Following treatment, NOAA collected samples to confirm that the treatment lowered contaminant levels to acceptable concentrations prior to the soil's beneficial reuse at the St. Paul landfill (NOAA 2005b).

NOAA and BSE removed the underlying stockpile liner at Polovina Hill and collected 12 confirmation samples from the PCS stockpile footprint on July 21, 2004 (NOAA 2005a). Samples were collected along a predetermined grid (Figure 4) and sent to a fixed-laboratory to verify that the stockpiled soils had not contaminated the site soils. BSE re-graded the stockpile footprint to match the surrounding ground surface (Photograph 3). This did not require the import of clean fill.

Fixed-laboratory results for the confirmation samples indicated contaminant concentrations well below ADEC Method Two cleanup criteria. The analytical results are summarized in Table 1.

[Note: the receipt of erroneous duplicate analytical data for sample SNPPSSS08-015 resulted in removal of an additional 10 cubic yards of soil in the location of this sample (Figure 4). Following this additional removal, BSE collected two additional confirmation samples (SNPPHS2SS01 and SNPPHS2SS02) on November 4, 2002. Results of these samples were below cleanup levels. It was later determined that the additional soil removal and confirmation sampling had been superfluous. The sample found to be above cleanup level was related to another site and had been mistakenly included in sampling results for this site.]

Summary and Recommended Action:

In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action, to the maximum extent practicable, at the Polovina

Hill stockpile site, non-TPA 47 in accordance with the Agreement and that ADEC grant a conditional closure not requiring further remedial action from NOAA. NOAA understands ADEC will/may require additional containment, investigation, or cleanup if subsequent information indicates that the level of contamination that remains does not protect human health, safety, or welfare, or the environment.

References:

Alaska Department of Environmental Conservation (ADEC). 1991. *Guidance for Storage, Remediation, and Disposal of Non-UST Petroleum Contaminated Soils*. State of Alaska. July 29.

ADEC. 2000. Title 18 of the Alaska Administrative Code 75, Articles 3 and 9. *Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. Amended through October 28, 2000.

Aleutian Enterprises. 1998. *NOAA Debris Cleanup, St. Paul Island, Alaska, 1997: Project Close Out Report*. Bering Sea Eccotech and Bristol Environmental Services Corp. joint venture. Project No 7029FG-00. February.

Bristol Environmental Services Corporation. 1997. *UST Removal and Closure Report. Saint Paul, Saint Paul Island, Alaska*. Project No. 7029FG-00. September.

Foster Wheeler Environmental Corporation. 2001. *Final Project Report, Petroleum-Contaminated Soil Remediation, St. Paul Island, Alaska*. RACII/Delivery Order No. 0077.

July 27.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two-Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26.

NOAA. 2005a. *Final Corrective Action Report, Polovina Hill Stockpile, St. Paul Island, Alaska*. Prepared by NOAA, Pribilof Project Office, Seattle, WA with Bering Sea Eccotech, Inc. Contract No. 50ABNC100043. January.

NOAA. 2005b. *Project Report for 2002 Petroleum-Contaminated Soil Remediation, St. Paul Island, Alaska*. Prepared by NOAA, Pribilof Project Office, Seattle, WA with Bering Sea Eccotech, Inc. Contract No. 50ABNC100043. In draft.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

2/4/05
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed to the maximum extent practicable at the Polovina Hill stockpile site, non-TPA 47 in accordance with the Agreement and that no further remedial action is required as a part of this conditional closure granted by ADEC.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

2/11/05
Date

Tables and Figures

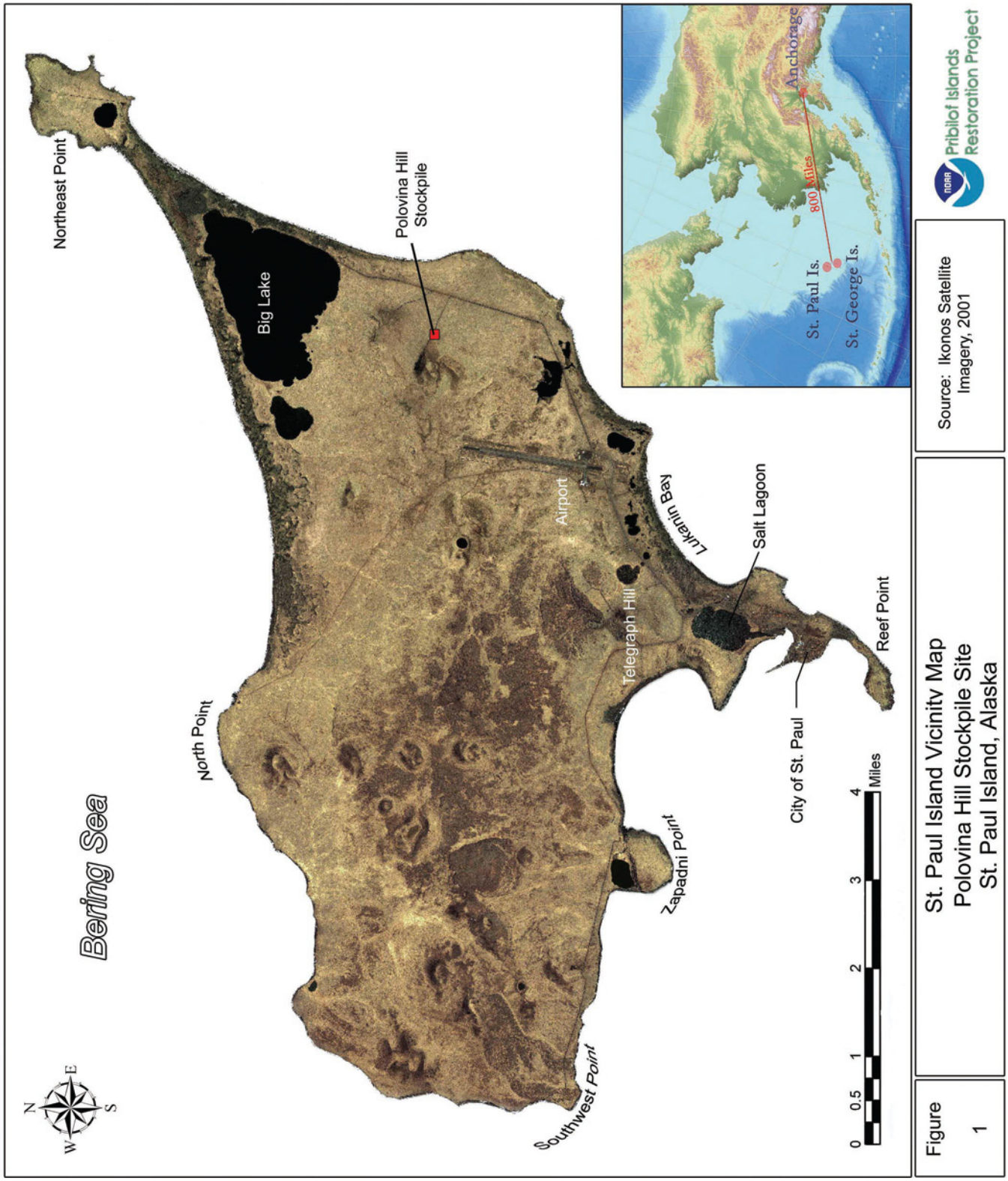
Table 1. 2002 Confirmation Sample Results (mg/kg) for the West Polovina Hill Stockpile

Sample #	Lead	GRO	DRO	RRO	Benzene	Ethyl-benzene	Toluene	P&M -Xylene	o-Xy-lene	Total Xylenes	Location
SNPPSSS01-020	1.39	ND (3.52)	ND (22.6)	ND (22.6)	ND (0.0176)	ND (0.0703)	ND (0.0703)	ND (0.103)	ND (0.0703)	ND (0.1733)	surface
SNPPSSS02-015	1.98	ND (3.87)	ND (23.6)	27.1	ND (0.0194)	ND (0.0775)	ND (0.0775)	ND (0.0775)	ND (0.0775)	ND (0.155)	surface
SNPPSSS03-015	1.89	ND (3.23)	ND (21.9)	ND (21.9)	ND (0.0162)	ND (0.0646)	ND (0.0646)	ND (0.0646)	ND (0.0646)	ND (0.1292)	surface
SNPPSSS04-015	2.49	ND (3.3)	ND (23.2)	30.4	ND (0.165)	ND (0.066)	ND (0.066)	ND (0.066)	ND (0.066)	ND (0.132)	surface
SNPPSSS05-015	1.56	ND (3.85)	ND (22.6)	25.3	ND (0.0193)	ND (0.0771)	ND (0.0771)	ND (0.0771)	ND (0.0771)	ND (0.1542)	surface
SNPPSSS06-015	2.03	ND (4.39)	ND (23.7)	44.2	ND (0.0219)	ND (0.0877)	ND (0.0877)	ND (0.0877)	ND (0.0877)	ND (0.1754)	surface
SNPPSSS07-020	3.67	ND (3.95)	ND (23.8)	28.8	ND (0.0198)	ND (0.0791)	ND (0.0791)	ND (0.0791)	ND (0.0791)	ND (0.1582)	surface
SNPPSSS08-015	1.79	ND (3.04)	ND (22.5)	34.5	ND (0.0152)	ND (0.0609)	ND (0.0609)	ND (0.0609)	ND (0.0609)	ND (0.1218)	surface
SNPPSSS09-015	1.67	ND (4.25)	ND (22.4)	28.4	ND (0.0214)	ND (0.0855)	ND (0.0855)	ND (0.0855)	ND (0.0855)	ND (0.171)	surface
SNPPSSS10-015	1.23	ND (3.52)	ND (20)	ND (20)	ND (0.0176)	ND (0.0703)	ND (0.0703)	ND (0.0703)	ND (0.0703)	ND (0.1406)	surface
SNPPSSS11-020	2.91	ND (4.28)	ND (23.3)	25.9	ND (0.0214)	ND (0.0856)	ND (0.0856)	ND (0.0856)	ND (0.0856)	ND (0.1712)	surface, duplicate of SNPPSS07-020
SNPPHS2SS01	NA	ND (5.7)	ND (24)	36.4	ND (0.0285)	ND (0.114)	ND (0.114)	ND (0.114)	ND (0.114)	ND (0.228)	resample of SNPPSS08-015
SNPPHS2SS02	NA	ND (3.51)	ND (22.7)	23.3	ND (0.0176)	ND (0.0703)	ND (0.0703)	ND (0.0703)	ND (0.0703)	ND (0.1406)	resample of SNPPSS08-015

NA: Not analyzed

ND: Analyte was analyzed for but not detected above method reporting limit (method reporting limit provided in parentheses)

☐ Re-sampled on 11/4/02 (All other samples collected on 7/21/02)


Northeast Point
Big Lake
Polovina Hill Stockpile
Bering Sea
North Point
Airport
Telegraph Hill
Lukanin Bay
Salt Lagoon
Reef Point
City of St. Paul
Zapadni Point
Southwest Point
N
E
S
W
0
0.5
1
2
3
4
Miles
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Pribilof Islands Restoration Project
Source: Ikonos Satellite Imagery, 2001
Figure 1
St. Paul Island Vicinity Map
Polovina Hill Stockpile Site
St. Paul Island, Alaska

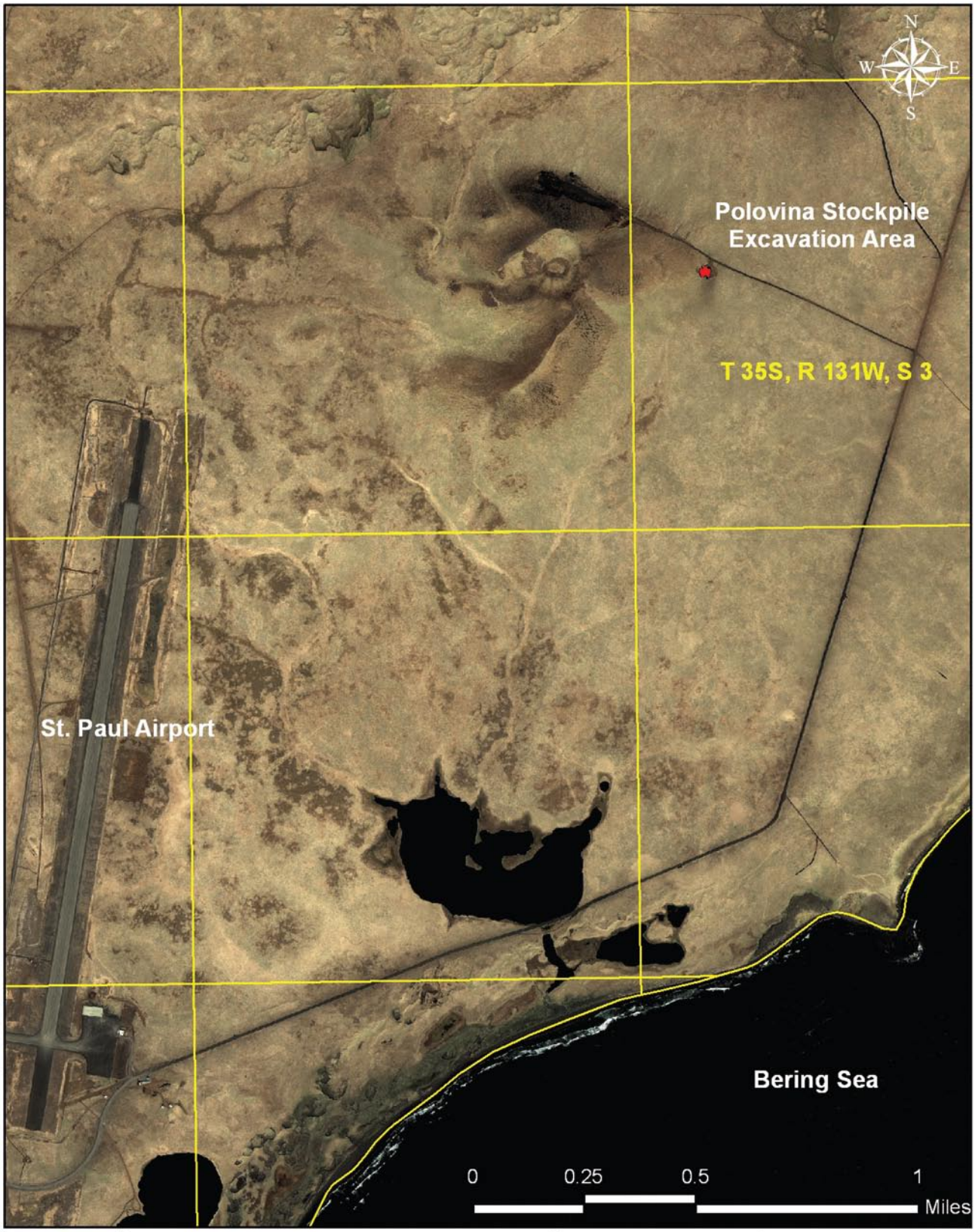
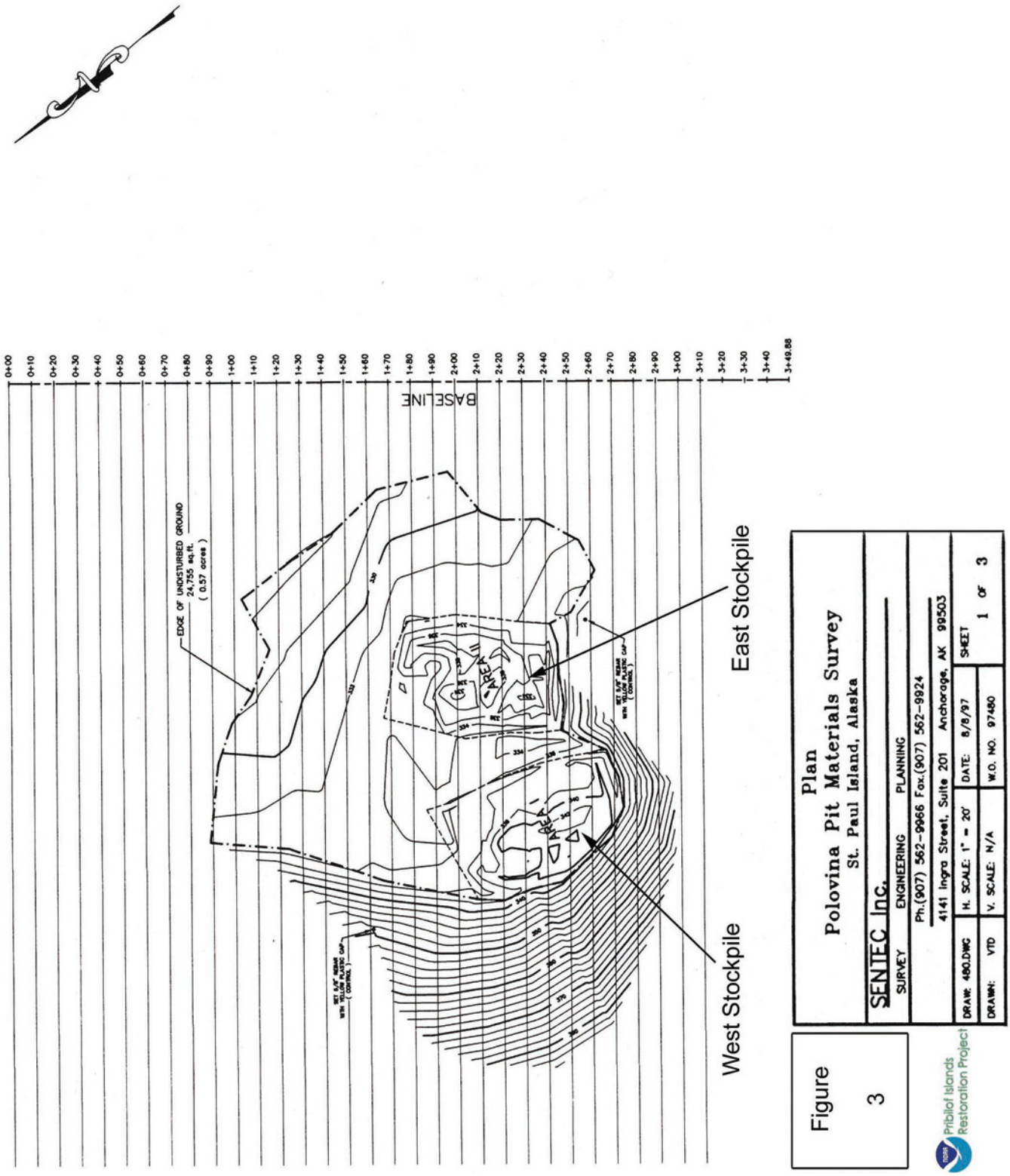


Figure 2	Legal Property Description Map Polovina Stockpile Excavation St. Paul Island, Alaska	Sources: NOAA Pribilof Project GIS, Ikonos Satellite Imagery (2001).	Pribilof Islands Restoration Project


BASELINE
EDGE OF UNDISTURBED GROUND
24,755 sq.ft.
(0.57 acres)
AREA
AREA
East Stockpile
West Stockpile
Figure
3
Plan
Polovina Pit Materials Survey
St. Paul Island, Alaska
SENTEC Inc.
SURVEY
ENGINEERING
PLANNING
Ph.(907) 562-9966 Fax.(907) 562-9924
4141 Ingra Street, Suite 201 Anchorage, AK 99503
DRAW: 480.DWG
H. SCALE: 1" = 20'
DATE: 8/8/97
SHEET
1 OF 3
DRAWN: VTD
V. SCALE: N/A
W.O. NO. 97480
Pribilof Islands
Restoration Project

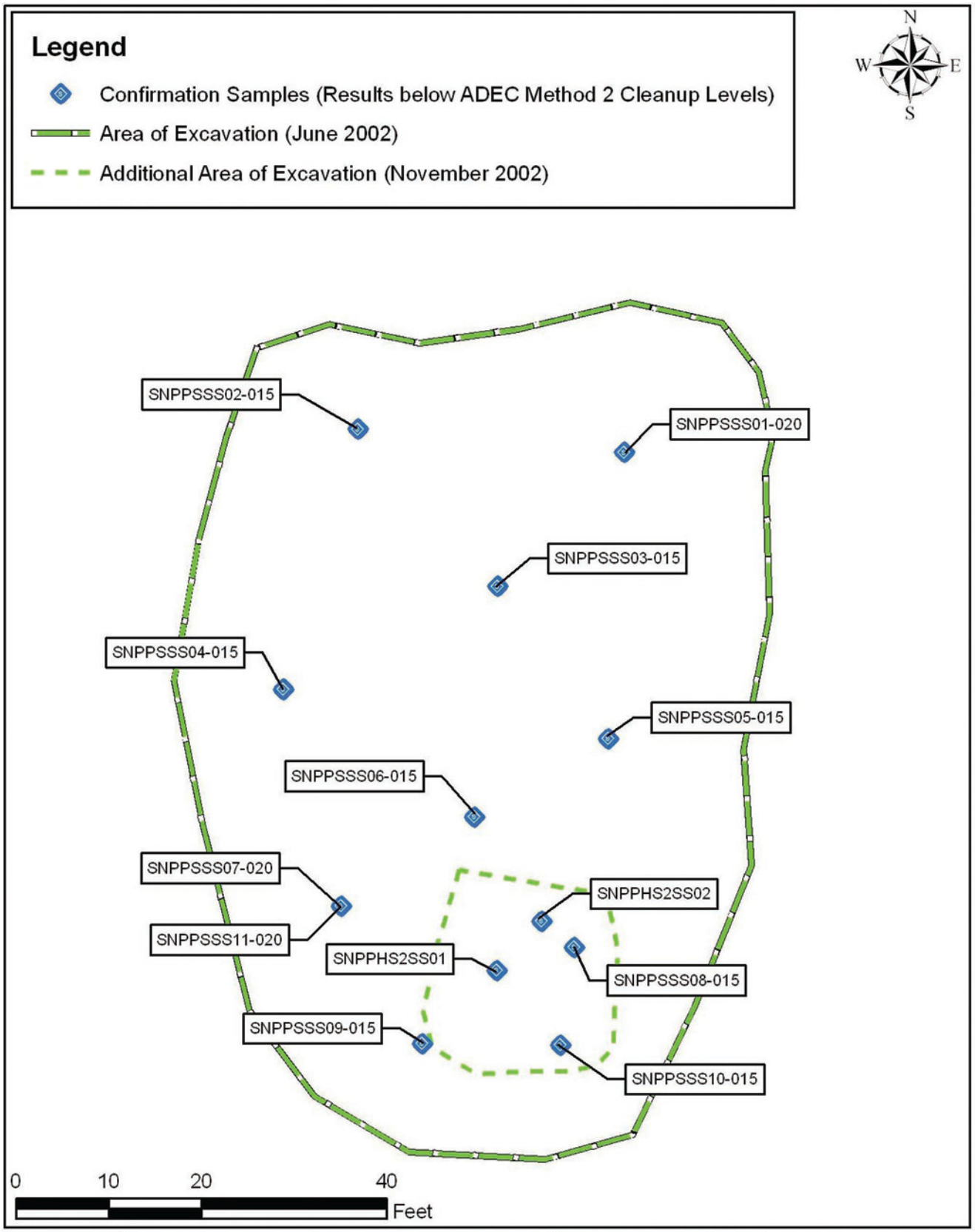


Figure 4

Sampling Locations and Results
Polovina Hill Stockpile Site
St. Paul Island, Alaska

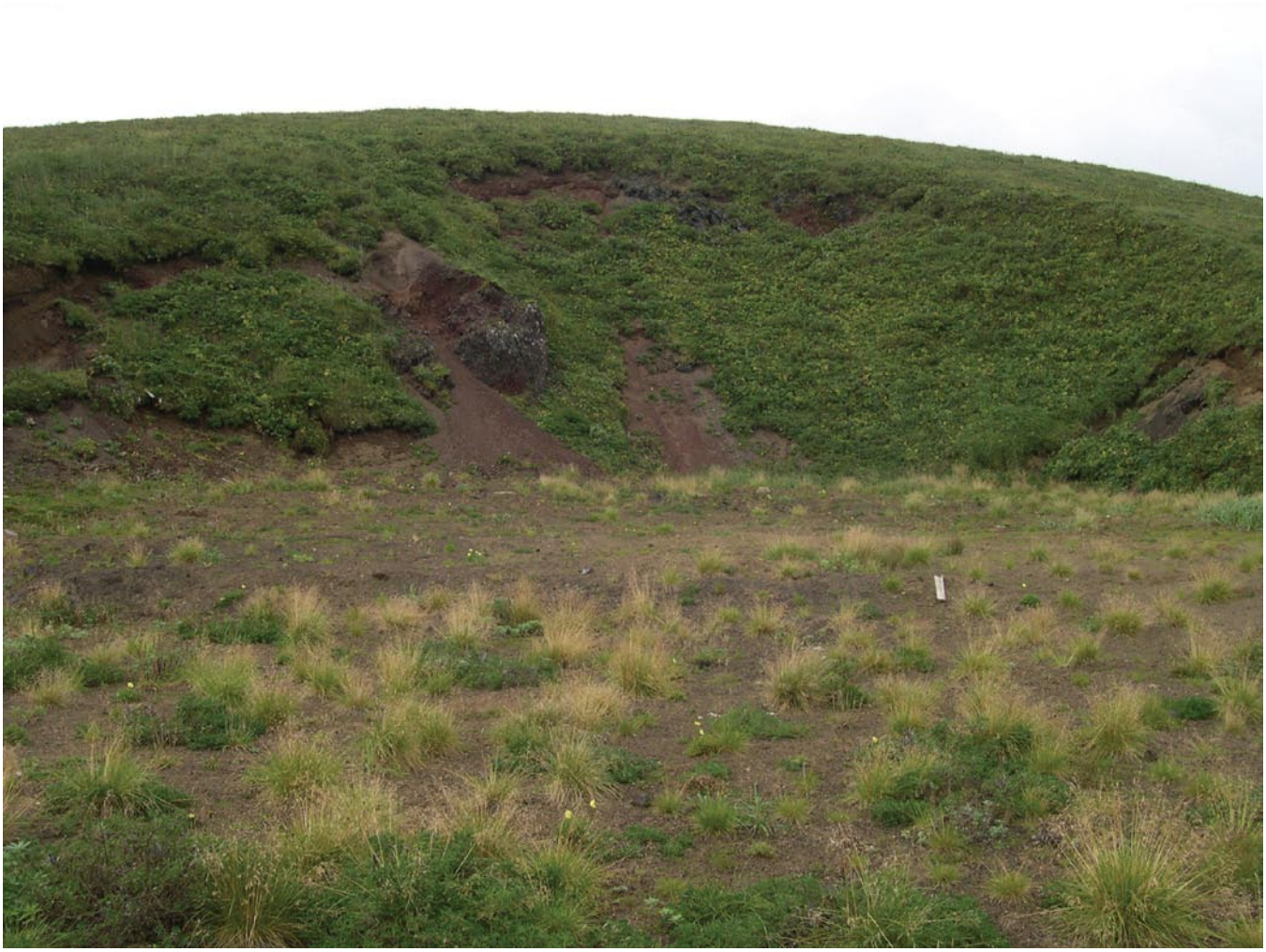
Source: NOAA Pribilof Project GIS & GPS, 2005.

Pribilof Islands Restoration Project

Photographs

Photograph 1. Stockpiled soils at Polovina Hill segregated according to type of contamination (*i.e.*, diesel or gasoline).

Photograph 2. Polovina Hill petroleum-contaminated soil stockpile in 2002 prior to removal.



Photograph 3. Polovina Hill stockpile site after cleanup actions (2003).

NOAA Sites 48, 56

NOAA Site 48 – NTPA: Windmill Wells

NOAA Site 56 – TPA Site NTPA: ATCO/Radio Bldg Barrel Staging Area

The History of Parcel 6f, the ATCO Building, and the Windmill Wells on St. Paul Island, Alaska as it Relates to Soil and Groundwater Cleanup Needs and Responsibilities 1167

Letter from Louis Howard to John Lindsay RE: Cleanup Needs and Responsibilities for Parcel 6f, the ATCO Building and the Windmill Wells on St. Paul Island June 2005. Dated July 5, 2005 1197

The History of Parcel 6f, the ATCO Building, and the Windmill Wells on St. Paul Island, Alaska as it Relates to Soil and Groundwater Cleanup Needs and Responsibilities

June 2005

National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE
Seattle, Washington 98115

Table of Contents

Executive Summary 1170
1.0 Introduction 1170
2.0 Background and History 1170
2.1 Parcel 6f 1170
2.2 ATCO Building 1172
2.3 Windmill Wells 1172
3.0 Previous Investigations and Cleanup Activities 1172
3.1 Parcel 6f 1172
3.2 ATCO Building 1173
3.3 Windmill Wells 1174
4.0 Potentially Remaining Cleanup Needs 1175
4.1 Parcel 6f 1175
4.2 ATCO Building 1175
4.3 Windmill Wells 1175
5.0 National Oceanic and Atmospheric Administration Mandates and Responsibilities 1175
5.1 Parcel 6f 1175
5.2 ATCO Building 1176
5.3 Windmill Wells 1176
6.0 Conclusions 1176
7.0 References 1177

Appendix I. Historic Correspondence and Documentation

Cover Photograph: The Naval radio station complex ca. 1919 (St. George Tanaq Corporation collection, glass negative, #40).

Figures

Figure 1. Locations of Sites and Structures of Interest, St. Paul Island Alaska
Figure 2. Parcel 6f and Vicinity, St. Paul Island, Alaska
Figure 3. Naval Radio Station Complex, 1918, Formerly Used Defense Site, St. Paul Island, Alaska
Figure 4. Naval Radio Station Complex, 1951, Formerly Used Defense Site, St. Paul Island, Alaska
Figure 5. Photograph of the above ground storage tank farm that powered the electrical shop, ca. 1919.
Figure 6. Aerial Photographs, Parcel 6f and ATCO Building Vicinity, St. Paul Island, Alaska
Figure 7. Windmill Well Locations, Formerly Used Defense Site, St. Paul Island, Alaska
Figure 8. Fresh Water Wells Details 1927, Naval Radio Station, St. Paul Island, Alaska
Figure 9. Photograph showing two windmills and towers built to support the St. Paul Island, Alaska Naval radio station water supply wells, 1930.
Figure 10. 2000 and 2001 Site Characterization, Parcel 6f Soil Data, St. Paul Island, Alaska
Figure 11. 2003 Corrective Action, Duplex Building and Former E-Shop, TPA Site 9i/Site 24, St. Paul Island, Alaska
Figure 12. 2004 X-ray Fluorescence Site Characterization, Duplex Building and Former E-Shop, TPA Site 9i/Site 24, St. Paul Island, Alaska
Figure 13. Groundwater Quality and Flow, Former Naval Radio Station Complex and Vicinity, St. Paul Island, Alaska
Figure 14. 2000 ATCO Investigation, ATCO Building and Vicinity Soil Data, St. Paul Island, Alaska

Executive Summary

The objective of this report is to clarify cleanup and closure needs and responsibilities for Parcel 6f, the ATCO building, and the windmill wells on St. Paul Island, Alaska. Under Public Law (P.L.) 104-91, the National Oceanic and Atmospheric Administration (NOAA) is responsible for the clean up of debris and contamination on St. Paul Island resulting from the activities of it and its predecessor agencies. NOAA's responsibility does not extend to formerly used defense sites (FUDS), for which P.L. 106-562 expressly prohibits NOAA from expending cleanup funds. Additionally, NOAA is not responsible for the cleanup of contamination and debris caused or contributed to by local entities, officials, or landowners after March 15, 2000; or for releases at any time by third parties on private property following property transfer under the Alaska Native Claims Settlement Act (ANCSA) or the Transfer of Property Agreement.

Parcel 6f is located within the area of the former Naval radio station complex, which the Department of Defense transferred to the U.S. Bureau of Fisheries, a predecessor agency of NOAA, in 1937. In 1979, pursuant to ANCSA, NOAA conveyed the majority of the land occupied by the former Naval radio station complex to the Tanadgusix Corporation (TDX) but retained Parcel 6f. The Department of Defense identified the former Naval radio station complex as a FUDS in 2003. NOAA has removed three underground storage tanks (USTs), presumably installed after the land was transferred from Department of Defense to the Bureau of Fisheries, and their associated petroleum-contaminated soil (PCS) from Parcel 6f. NOAA has also removed PCS associated with an active, on-site aboveground storage tank (AST). Confirmation samples collected during the PCS removal actions revealed the presence of lead above its cleanup level at two sampling locations. NOAA believes the presence of lead at this site is attributable to activities other than fueling operations. Further, NOAA presumes that any soil contamination other than that related to three former USTs and the active AST is associated with the former Naval radio station complex and is therefore a FUDS issue.

The ATCO building is located less than 50 feet northeasterly of the Parcel 6f boundary on land owned by TDX. Aerial photographs indicate that the ATCO building was constructed sometime between 1982 and 1993. The building purportedly was used to house fish processing plant employees and/or breakwater construction workers. NOAA investigated groundwater and soil about the ATCO building, beyond NOAA's property boundaries, to evaluate potential migration of contamination for which NOAA is responsible. NOAA pursued this effort prior to the identification of the former Naval radio station complex as a FUDS. Based on groundwater monitoring data, soil data, and anecdotal information (*e.g.*, observations of fuel line leaks and stained soil, historic photographs) for the ATCO building vicinity, NOAA presumes that area groundwater contamination is associated with either a significant release at the ATCO building or previous FUDS activities (the Naval radio station complex's electrical shop was located up gradient of the ATCO building). Nevertheless, to address the St. Paul Island Village groundwater contamination for which NOAA and its predecessor agencies may be responsible, NOAA is working with the Alaska Department of Environmental Conservation (ADEC) and the Alaska Department of Natural Resources to designate a Critical Groundwater Management Area as an institutional control prohibiting well installation and groundwater use within the designated area. Free product and PCS removal remain to be addressed by a responsible party.

At the request of the Navy, the Department of Commerce, Bureau of Fisheries agreed to assist the Navy in the installation of a system of windmill-powered wells (windmill wells) in 1927. Ultimately, three windmill wells were constructed along the east side of Polovina Turnpike just north of the current St. Paul post office. Currently, the northern most well is filled in with soil. The south and central wells are large vaulted spaces and each is capped with a large concrete box sealed with a plywood top. NOAA tasked its contractor with investigating the windmill wells as part of a larger site characterization effort before the history of the wells was clear. The investigation found that water samples from the wells did not exceed ADEC Table C cleanup levels. Various types of debris were observed in two well vaults. Per Title 18 of the *Alaska Administrative Code* (AAC) 75.346(j), the wells require decommissioning in accordance with ADEC *Recommended Practices for Monitoring Well Design, Installation, and Decommissioning*. Given that NOAA is unaware of any potential sources for petroleum constituents in the windmill wells and NOAA now considers these wells part of the Naval radio station complex FUDS, for which P.L. 106-562 expressly prohibits NOAA from expending cleanup funds, no additional investigative activities or formal well closure are planned by NOAA.

NOAA has taken responsibility for the clean up of contamination and debris where it is associated with its and its predecessor agencies' use of sites and structures. NOAA's data and information on Parcel 6f, the ATCO building, and the windmill wells may be used to assist other entities in cleanup and closure activities as necessary.

1.0 Introduction

The objective of this report is to clarify cleanup and closure needs and responsibilities for sites and structures on St. Paul Island, Alaska, namely those known as Parcel 6f, the ATCO building, and the windmill wells (Figure 1). Under Public Law (P.L.) 106-562 Section 107, the National Oceanic and Atmospheric Administration (NOAA) is specifically prohibited from further expending funds for the remediation of formerly used defense sites (FUDS) on the Pribilof Islands. P.L. 106-562 Section 105 also states that the Secretary of Commerce may not seek or require financial contribution by or from any local governmental entity of the Pribilof Islands, any official of such an entity, or the owner of land on the Pribilof Islands, for cleanup costs incurred; however this should not limit the authority of the Secretary of Commerce to seek or require financial contribution from any person for costs or fees to clean up any matter that was caused or contributed to by such person on or after March 15, 2000.

2.0 Background and History

2.1 Parcel 6f

Parcel 6f encompasses a duplex and the Former Electrical Shop (also known as the E-Shop), collectively known as Two Party Agreement (TPA; NOAA 1996) Site 9i (Figure 2). Parcel 6f was previously referred to as Parcel 7—housing and Airport Road shop—in the Transfer of Property Agreement (TOPA; NOAA 1984). It is located within the area of the former Naval radio station complex. Maps from 1918 (Reynolds 1918) and 1951 (Bishop 1951) indicate that the Naval radio station complex included a power house (the E-Shop), radio towers, a coal-house, a paint house, cottages, operator's quarters, a machine shop, a fuel tank farm, a hall, a tank house, and a pump house (Figures 3 and 4).

The E-shop originally served as the powerhouse of the former Naval radio station, which was constructed in 1911 on approximately 19 acres separating Village Cove from a small seasonal pond (New York Times 1911, DOD 2003). An aboveground storage tank (AST) farm with fifteen 500-gallon tanks fueled the electrical power generation at the former powerhouse (Reynolds 1918; Figures 3 and 5). A photograph from ca. 1919 (see cover photograph; St. George Tanaq collection) shows an additional AST tank farm located about 100-200 feet easterly and oriented perpendicular to the E-Shop AST farm.

In 1937, the Department of Defense transferred the radio station complex to the U.S. Bureau of Fisheries, a predecessor agency of NOAA (DOD 2003; Appendix I). The transfer agreement required the Bureau to maintain the communications capability between St. Paul and the Naval radio station at Dutch Harbor, Alaska. The Navy removed most of the radio and ancillary equipment at the time of disestablishment, leaving only enough equipment for maintenance of communications with Dutch Harbor.

At the time of the transfer, a tank farm fueled the E-Shop. The tank farm was removed on an unknown date prior to 1951 (Bishop 1951). Presumably the Bureau of Fisheries or NOAA subsequently installed an underground storage tank (UST) to service heat in the E-Shop.

The duplex was relocated to its current site, about 50 feet north of its previous location, sometime after 1951 (CESI 2000, Bishop 1951). At that time, USTs were presumably installed on the east and west sides to service the heating system.

In 1979, NOAA conveyed the majority of the land occupied by the former Naval radio station complex, as well as other island properties, to the Tanadgusix Corporation (TDX) as part of the land withdrawals made pursuant to Alaska Native Claims Settlement Act (ANCSA). The complex has been subdivided and is now in use for residential housing and commercial purposes. NOAA retained Parcel 6f during the 1979 land withdrawal. Under the TOPA (NOAA 1984), NOAA agreed to transfer Parcel 6f (then Parcel 7) to the Aleut Community of St. Paul Is-

land. The property has not yet been conveyed. Currently, however, the St. Paul Indian Reorganization Act (IRA) Council uses the E-Shop for the island's Head Start Program, and TDX utilizes the duplex as rental units.

The Department of Defense identified the former Naval radio station complex as a FUDS in 2003. Its FUDS property identification number is F10AK1042 (DOD 2003).

2.2 ATCO Building

The ATCO building is located approximately 80 feet northeast of the E-shop, outside of Parcel 6f on land owned by TDX (Figure 1). Historic maps, blueprints, and aerial photographs from as early as 1918 show no development in this area as recent as 1982 (Reynolds 1918, Bishop 1951; Figure 6). Septic leach fields (associated with the Naval radio station complex and Tract 46 operations) were present in the area (Reynolds 1918, CESI 2000). Aerial photographs indicate that the ATCO building was constructed sometime between 1982 and 1993 (Figure 6). The building purportedly was used to house fish processing plant employees and/or breakwater construction workers.

2.3 Windmill Wells

Three former windmill-powered wells, herein referred to as the north, central, and south wells, are located along the east side of Polovina Turnpike between the St. Paul post office and the NOAA staff quarters building (Figure 7). The northern most well (*i.e.*, the north well) is filled in with soil (IT Alaska 2001). The south and central wells are large vaulted spaces and each is capped with a large concrete box sealed with a plywood top.

At the request of the Navy, the Department of Commerce, Bureau of Fisheries agreed to assist the Navy in the installation of a system of windmill wells in 1927 (Davis 1927; Appendix I). Naval plans approved February 12, 1927 show details for the construction of three wells powered by one windmill at the location described above (Figure 8). The plans indicate that the Navy should "discontinue using water from Well No. 1 [the south well] as soon as Wells Nos. 2 and 3 are put in commission and reconstruct as shown about one year later, if water has freshened in the interval." According to the Bureau of Fisheries 1927 St. Paul Island agent's log, Albert Christoffersen and eight temporary workers commenced preparations for construction of the Navy wells on May 31, 1927, completing work on October 20, 1927. A March 13, 1928 letter (Appendix I) to Mr. Christoffersen from his superintendent states, "Mr. Miller of the Navy Yard [Puget Sound, Washington] was just over and wants us to dig another well for him this year. He states that the two wells built are working very satisfactory… there should be one well 12x12 for emergency." A 1945 inventory for St. Paul Island (Appendix I) indicates that the requested 12-foot by 12-foot well was built in 1928. An August 1930 photograph indicates at least one additional windmill had been constructed to support the Naval radio station wells by that time (Figure 9).

3.0 Previous Investigations and Cleanup Activities

3.1 Parcel 6f

In August 2000, NOAA contractor Columbia Environmental Sciences, Inc. (CESI 2000) removed the E-Shop UST with assistance from their subcontractor Bering Sea Eccotech (BSE). During the removal, NOAA and its contractors discovered that the UST had been constructed from a retrofitted 55-gallon drum. The soils in the UST excavation were highly contaminated based on field observations, soil screening, and fixed-laboratory analyses; however, the presence of the E-Shop and utilities limited the excavation of the contaminated soil.

Soil samples collected during site characterization efforts in 2000 and 2001 revealed the presence of DRO and RRO above Alaska Department of Environmental Conservation (ADEC) Method Two cleanup levels between the E-Shop and the duplex (CESI 2001; Figure 10).

In a 2003 corrective action, NOAA contractors removed petroleum-contaminated soil (PCS) from the northeast and southeast corners of the E-Shop (NOAA 2003, Tetra Tech 2005a). The excavation at the northeast corner was conducted in the area of the former UST. Approximately 20 cubic yards of soil were removed from the area. The

presence of active phone and electrical lines and the likely presence of an active water line limited the excavation. The excavation at the southeast corner was beneath an active AST, which was temporarily moved. During the excavation, numerous copper rods were uncovered, presumably electrical grounding rods associated with the former Naval radio station complex. Approximately 30 cubic yards of soil were removed from the area. The presence of the E-shop, utility lines, a phone line, and an unknown pipeline restricted further excavation.

Following excavation, one confirmation sample collected from the northeast corner exceeded the DRO alternative cleanup level of 2,500 mg/kg, with a concentration of 2,700 mg/kg (Figure 11). No further excavation was practicable in the area of this sample. One confirmation sample collected from the southeast corner at 5 feet below ground surface (bgs) exceeded the lead cleanup level of 400 mg/kg, with a concentration of 4,090 mg/kg lead (Figure 11). No other contaminants were identified at concentrations above the soil cleanup levels.

The 2003 corrective action also addressed the removal of the two USTs at the duplex (Tetra Tech 2005a). Along the east side of the duplex 50 cubic yards of soil were removed along with the UST. No evidence of contamination was observed either in the excavation or in soil removed from the excavation. Results of five confirmation samples indicated concentrations of all contaminants were below the ADEC Method Two cleanup levels.

Along the west side of the duplex 70 cubic yards of soil were removed along with the UST. Excavation was limited in lateral extent by the building and utility lines. Results of seven confirmation samples indicated that four samples exceeded the ADEC Method Two cleanup level of 250 mg/kg DRO, but none exceeded the alternative cleanup level of 2,500 mg/kg DRO (Figure 11). One sample collected from approximately 2 feet bgs exceeded the lead cleanup level of 400 mg/kg, with a concentration of 627 mg/kg lead (Figure 11).

To address the lead cleanup level exceedances at the E-Shop and duplex, representatives from NOAA and the U.S. Environmental Protection Agency (EPA) conducted site characterization sampling for lead in 2004 (Tetra Tech 2005a; Figure 12). Data indicated that concentrations of lead within 1 foot of the ground surface above the previous sampling locations do not exceed the lead cleanup level. Soil samples collected from within the Head Start Program play area also indicated that lead concentrations were below the cleanup level in the top foot of soil.

NOAA has monitored the groundwater plume(s) from Parcel 6f using monitoring wells MW46-13, MW46-16, MW46-17, MW46-18, and MW46-20 (IT Alaska 2002; Figure 13). Generally, these wells were sampled quarterly between September 2000 and September 2001 (IT Alaska 2002) and between October 2003 and July 2004 (Tetra Tech 2005b) for petroleum hydrocarbons, including DRO, GRO, benzene, toluene, ethylbenzene, and xylenes. No ADEC Table C cleanup level exceedances were detected in up gradient well MW46-20 or in down gradient wells MW46-16 and MW46-17. In down gradient wells MW46-13 and MW46-18, located south of Parcel 6f and near the west-southwest side of the ATCO building, DRO exceeded the ADEC Table C cleanup level of 1.5 mg/L. For well MW46-13, maximum concentrations of 12 mg/L and 5.5 mg/L DRO were detected during 2000-2001 and 2003-2004 sampling events, respectively. For well MW46-18, maximum concentrations of 2.3 mg/L and 3.2 mg/L DRO were detected during 2000-2001 and 2003-2004 sampling events, respectively.

3.2 ATCO Building

On August 25, 2000, in an attempt to delineate the eastern extent of the contamination plume from the E-Shop, CESI (2000) drilled and installed monitoring well MW46-19 immediately north of the northwest end of the ATCO building (Figure 13). According to CESI, the soils were heavily contaminated. Over two feet of light, non-aqueous phase liquid (LNAPL) was found in the well floating on the water column. CESI reported that the LNAPL had the appearance and smell of fresh diesel fuel, and that the soil did not have the same appearance or odor as the contaminated soils in MW46-13 and MW46-18 borings. Subsequent analysis of groundwater from below the LNAPL in well MW46-19 identified the presence of DRO, GRO, and benzene above ADEC Table C cleanup levels (1.5 mg/L, 1.3 mg/L, and 0.005 mg/L, respectively). DRO was detected at 2.6 mg/L, GRO at 2.7 mg/L, and benzene at 26 mg/L (CESI 2001, IT Alaska 2002; Figure 13).

Following the discovery of free product in well MW46-19, CESI drilled wells MW46-20, MW46-25, MW46-26, and MW46-27 in another attempt to delineate the contaminant plume(s) (CESI 2000; Figure 13). Well MW46-20, south of Parcel 6f, served as a background well and confirmed that the regional groundwater flow gradient is generally from south to north. Well MW46-25, east of the ATCO building, bound the eastern extent of groundwater

contamination. Well MW46-26, south of the ATCO building, delineated the groundwater plume from the duplex USTs and the UST at the residence to the east of the duplex. Well MW46-27, north of the ATCO building, bound the northern extent of the groundwater plume. DRO, GRO, and benzene were not detected above cleanup levels in these wells. DRO was detected in wells MW46-25, MW46-26, and MW46-27 with a maximum concentration of 0.17 mg/L (IT Alaska 2002).

CESI also collected soil samples during monitoring well installation and from additional soil borings (CESI 2001; Figure 14). Soil data indicate that DRO concentrations are high (above the Ten Times Rule cleanup level) near the northeast and northwest corners of the ATCO and on the west side of the ATCO. Soil boring intervals near the groundwater table were as high as 10,000 mg/kg DRO at RBSB-10. In sample SS46-5-1, a surface sample collected from a stained area west of the ATCO, RRO exceeded the Method Two cleanup levels for all pathways with a concentration of 39,000 mg/kg.

DRO and RRO were not detected in two soil borings north of the ATCO (RBSB-11 and RBSB-16), east of monitoring well MW46-19 where free product was found. To the south of the ATCO, DRO and RRO concentrations did not exceed Method Two cleanup levels.

On September 8 and 9, 2000, CESI (with permission from TDX) conducted a reconnaissance on the interior and exterior of the ATCO building (CESI 2000). An AST was present at the east end of the building. Four oil-fired furnaces were located along the north wing of the building, and three oil-fired furnaces were located along the south wing of the building. It appeared that piping ran from the AST along the ground underneath the north and south wings of the building to the furnaces. Further inspection beneath the north wing of the building found an iron fuel-distribution line that ran from the east end of the building (near the AST) to the west end of the building (near MW46-19). CESI observed the appearance of leaks along the line in two locations—about 50 feet from the east end of the building, and at the end of the line near MW46-19. Both locations were near fittings that appeared to have been inadequately tightened.

CESI observed soil staining and a strong, fresh petroleum smell at the end of the line near MW46-19. CESI dug a test pit to 2.5 feet bgs at this location and collected three soil samples. Screening results indicated that the soil samples were contaminated at levels above 20,000 mg/kg total petroleum hydrocarbons (CESI 2000, CESI 2001).

Based on field sampling and observations, CESI (2000) hypothesized that the ATCO building plume is distinct from the E-Shop plume and is younger. CESI removed about 12 gallons of LNAPL as part of an interim removal action (CESI 2000). After each period of removal, the free product recovered to near its original depth, indicating the amount of LNAPL in the plume is large relative to the amount removed.

Between October 2003 and July 2004, Tetra Tech (2005b) resampled wells in the vicinity of the ATCO building on a quarterly basis (Figure 13). DRO continued to be detected above the ADEC Table C cleanup level in well MW46-19, and also in wells MW46-13 and MW46-18 as discussed in section 3.2. Previously found above cleanup levels, GRO was detected below its Table C cleanup level and benzene was not detected in well MW46-19. As in the 2000 sampling, DRO, GRO, and benzene were not detected above cleanup levels in wells MW46-26 and MW46-27 (Note: Due to damage to the well, MW46-25 was not sampled in 2003-2004).

3.3 Windmill Wells

During the site characterization efforts for Tracts 46 and A, under contract to NOAA, CESI observed sheen on the surface water of two windmill wells (Lindsay 2001) [note: the third and northern most windmill well had been previously filled in with soil]. Concerned that this sheen may have origins associated with historic releases, NOAA tasked IT Alaska, Inc. (IT Alaska) to further investigate the wells (IT Alaska 2001). IT Alaska visually examined the two wells (*i.e.*, the south and central wells). Standing water was visible in both wells at depths varying from a few inches up to approximately 1.5 feet. The water appeared to be relatively clear but had moderate organic surface scum and a weak sheen that appeared to be of biogenic rather than petroleum origin. It was unclear whether the water represented groundwater or perched surface water. Various types of debris were visible at the bottom of the well vaults.

IT Alaska installed a monitoring well (MWWW-1) to determine if the groundwater had been impacted between the two existing wells. Water samples were collected from MWWW-1 and the south and central windmill wells

for laboratory analysis of GRO, DRO, RRO, polynuclear aromatic hydrocarbons (PAHs), and BTEX [Note: no ADEC-approved analysis method exists for RRO in water; thus RRO results will not be discussed.]. The sample from MWWW-1 was also analyzed for volatile organic compounds (VOCs). Findings indicated that although petroleum-related compounds are present in the groundwater, concentrations are below ADEC Table C cleanup criteria (IT Alaska 2001). DRO was detected in all the wells. GRO was detected only in the south well, and then at an estimated concentration. BTEX and PAHs were not detected in any of the wells.

4.0 Potentially Remaining Cleanup Needs

4.1 Parcel 6f

NOAA removed the source of DRO contamination (*i.e.*, USTs) from Parcel 6f along with associated PCS to the extent practicable. Confirmation sampling indicated that lead contamination remains in two locations. Table C exceedances for DRO were detected in two groundwater-monitoring wells (MW46-13 and MW46-18) that are considered down gradient of the E-Shop and duplex. However, investigations remain inconclusive regarding the source of the contamination observed in these wells.

4.2 ATCO Building

Free product (LNAPL) is present in well MW46-19, located immediately north of the northwest corner of the ATCO Building. Groundwater monitoring (below the LNAPL) has detected a DRO concentration as high as 15 mg/L in this well. Soil screening results for the vicinity indicated total petroleum hydrocarbon concentrations above 20,000 mg/kg. The suspected source of the contamination, an iron fuel-distribution line, is still present though it is inactive. The line has leaks in two locations—about 50 feet from the east end of the building and at the end of the line near MW46-19. Cleanup at this site will likely require the removal of the ATCO building from over the area of contamination, the excavation of contaminated soil, and the removal of LNAPL from the water table.

4.3 Windmill Wells

Various types of debris have been observed in two well vaults and may require removal. Per Title 18 of the *Alaska Administrative Code* (AAC) 75.346(j), the wells require decommissioning in accordance with ADEC *Recommended Practices for Monitoring Well Design, Installation, and Decommissioning* (ADEC 1992).

5.0 National Oceanic and Atmospheric Administration Mandates and Responsibilities

5.1 Parcel 6f

Under P.L. 106-562, the Pribilof Islands Transition Act approved December 23, 2000, NOAA is prohibited from expending any funds authorized under P.L. 104-91 and P.L. 106-562 to cleanup Department of Defense related wastes and debris, including petroleum products, on the Pribilof Islands. On Parcel 6f, NOAA presumes that any soil contamination other than that related to the three former USTs and the active AST is associated with the Naval radio station complex (*i.e.*, a FUDS). Further, NOAA presumes that any groundwater contamination in the vicinity of Parcel 6f is due to either FUDS or ATCO building activities.

NOAA removed the UST at the E-Shop prior to the passage of P.L. 106-562. Regardless, NOAA presumes this UST and those at the duplex were installed after the building was transferred from Department of Defense to the Bureau of Fisheries. Given that the USTs' installation and fuel releases were distinct from FUDS activity, NOAA assumed responsibility for cleanup. PCS cleanup associated with the former USTs occurred in 2003. NOAA also removed PCS associated with an active, on-site AST. It is not known when this AST came into use, but presumably during NOAA or one of its predecessor agencies' watch.

Confirmation samples collected during the PCS removal actions revealed the presence of lead above its cleanup level at two sampling locations. NOAA believes the presence of lead at this site is attributable to activities other than fueling operations. GRO was not detected in the samples with the lead exceedance, indicating that the presence of lead is not associated with fuel such as leaded gasoline. Historic operations at the Naval radio station complex likely included the use of lead solder as part of routine operations. Disposal of lead-containing batteries also may have occurred on site. In any case, NOAA does not consider the lead to be related to activities conducted by it or its predecessor agencies. Regardless of responsibility, because the former E-Shop is currently used for St. Paul Island's Head Start Program, NOAA felt it prudent to investigate surface soils in the vicinity for the presence of lead. Results of the investigation indicated that elevated lead concentrations are not present in the top 1 foot of soil.

5.2 ATCO Building

The ATCO building site is adjacent to NOAA property (*i.e.*, Parcel 6f). NOAA investigated groundwater and soil about the ATCO building, beyond NOAA's property boundaries, to evaluate potential migration of contamination for which NOAA is responsible. NOAA pursued this effort prior to the identification of the former Naval radio station complex as a FUDS.

Based on groundwater monitoring data, soil data, and anecdotal information (*e.g.*, observations of fuel line leaks and stained soil, historic photographs), NOAA presumes that groundwater contamination down gradient from the E-Shop, is associated with either previous FUDS activities or a significant release at the ATCO building. To address the groundwater contamination for which NOAA and its predecessor agencies may be responsible, NOAA is working with ADEC and the Alaska Department of Natural Resources to designate a Critical Groundwater Management Area (CWMA) as an institutional control under AS 46.15. A CWMA would prohibit groundwater well installation and groundwater use within the designated area. NOAA and the State are in agreement that a designated CWMA should include the areas of the former Naval radio station complex and the ATCO building. Groundwater in the area being considered for designation is not potable (ADEC 2002, Mitretek 2002), and thus a CWMA designation should not present a hardship for area residents. If the State determines that a CWMA is appropriate for the area, then groundwater contamination within the area would be under alternative cleanup levels equal to 10 times the ADEC Table C criteria (18 AAC 75.345 (b)). The free product would require removal in accordance with 18 AAC 75.325(f).

5.3 Windmill Wells

NOAA tasked its contractor with investigating the windmill wells as part of a larger site characterization effort at a time when the history of the wells was unclear. NOAA now considers these wells a part of the Naval radio station complex FUDS. There is no evidence the wells have been affected by contamination for which NOAA is responsible, and NOAA is unaware of any potential sources for petroleum constituents in the windmill wells. Further, data indicate that ADEC Table C cleanup levels are not exceeded in the wells. For these reasons, NOAA has no intention of undertaking additional investigative activities related to the wells or formal well closure (Lindsay 2001).

6.0 Conclusions

Under P.L. 104-91, NOAA is responsible for the clean up of debris and contamination on St. Paul Island resulting from the activities of it and its predecessor agencies. NOAA is not responsible for the cleanup of contamination and debris caused or contributed to by local entities, officials, or landowners after March 15, 2000; or for releases at any time by third parties on private property following property transfer under ANSCA or TOPA; or releases caused by the Department of Defense at any time. For the sites and structures discussed herein, NOAA has taken responsibility for the clean up of contamination and debris where it is associated with NOAA and NOAA predecessor agencies' use. NOAA's data and information on Parcel 6f, the ATCO building, and the windmill wells may be used to assist other entities in cleanup and closure activities as necessary.

7.0 References

Alaska Department of Environmental Conservation (ADEC). 1992. *Recommended Practices for Monitoring Well Design, Installation, and Decommissioning*. Guidance No. 001. Division of Environmental Quality, Water Quality Section. April.

ADEC. 2002. Letter from Louis Howard (ADEC) to John Lindsay (NOAA Pribilof Project Office) regarding ADEC conditional approval for applying the Ten Times Rule. May 30.

Bishop, R.W. 1951. Map of St. Paul Village showing new water distribution system, new sewage disposal system, and improved salt water wash system. U.S. Department of the Interior, Fish and Wildlife Service, Branch of Alaska Fisheries. April.

Davis, S. 1927. Letter from Stephen Davis, Acting Secretary of Commerce to the Honorable Curtis D. Wilbur, Secretary of the Navy regarding Department of Commerce cooperation in improving the naval radio station water supply. January 25.

Department of Defense (DOD). 2003. Native American Environment Tracking System, Tribe Report. Provided to Mr. Phil Zavadil, St. Paul Island by Ms. Stacey Halfmoon, DOD on February 27.

Columbia Environmental Sciences, Inc. (CESI). 2000. *Letter Report on Parcel 6f/ATCO Investigation*. September 12.

CESI. 2001. Draft Site Characterization Report. *Tract 46 and Vicinity (TPA Site 9), Saint Paul Island, Alaska*. Version 1.6, May 3 and Version 2.1, December 16.

IT Alaska, Inc. (IT Alaska). 2001. *Windmill Wells Water Sampling Effort, St. Paul Island, Alaska*. Letter report to John Lindsay, NOS/NOAA/Pribilof Project Office. October 1.

IT Alaska. 2002. *Draft Annual Groundwater Monitoring Report 2001, St. Paul Island, Alaska*. March.

Lindsay, J. 2001. Letter to Louis Howard (ADEC) regarding and transmitting IT Alaska, Inc.'s windmill wells investigation report. December 5.

Mitretek Systems (Mitretek). 2002. *Final Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska*. May.

National Oceanic and Atmospheric Administration (NOAA). 1984. *Transfer of Property on the Pribilof Islands: Descriptions, Terms and Conditions*.

NOAA. 1996. *Pribilof Islands Environmental Restoration Two-Party Agreement*. Attorney General's Office File No. 66 1-95-0126. January 26.

NOAA. 2003. *Corrective Action Plan, Underground Storage Tank Removals at Tract A House 102 (TPA Site 9r) and Duplex Building and Former E-Shop (Parcel 6f) TPA Site 9i, St. Paul Island, Alaska*. April 29.

New York Times. 1911. *Asked Baseball News First; Pribilof Islanders Thus Open Wireless Communications with Outsiders*. July 15, p. 1.

Reynolds, A.C. 1918. Map of Naval Radio Station based on surveys made during the summer of 1917 by William Hayne.

Tetra Tech EMI (Tetra Tech). 2005a. *Final Corrective Action Report, Site 24/TPA Site 9i—Duplex Building and Former E-Shop, St. Paul Island, Alaska*. January 7.

Tech Tech. 2005b. *Initial Draft, Field Investigation Report, St. Paul Island, Alaska, Pribilof Islands Environmental Restoration Project, St. Paul Island, Alaska*. January 11. In review, draft and final pending.

Figures

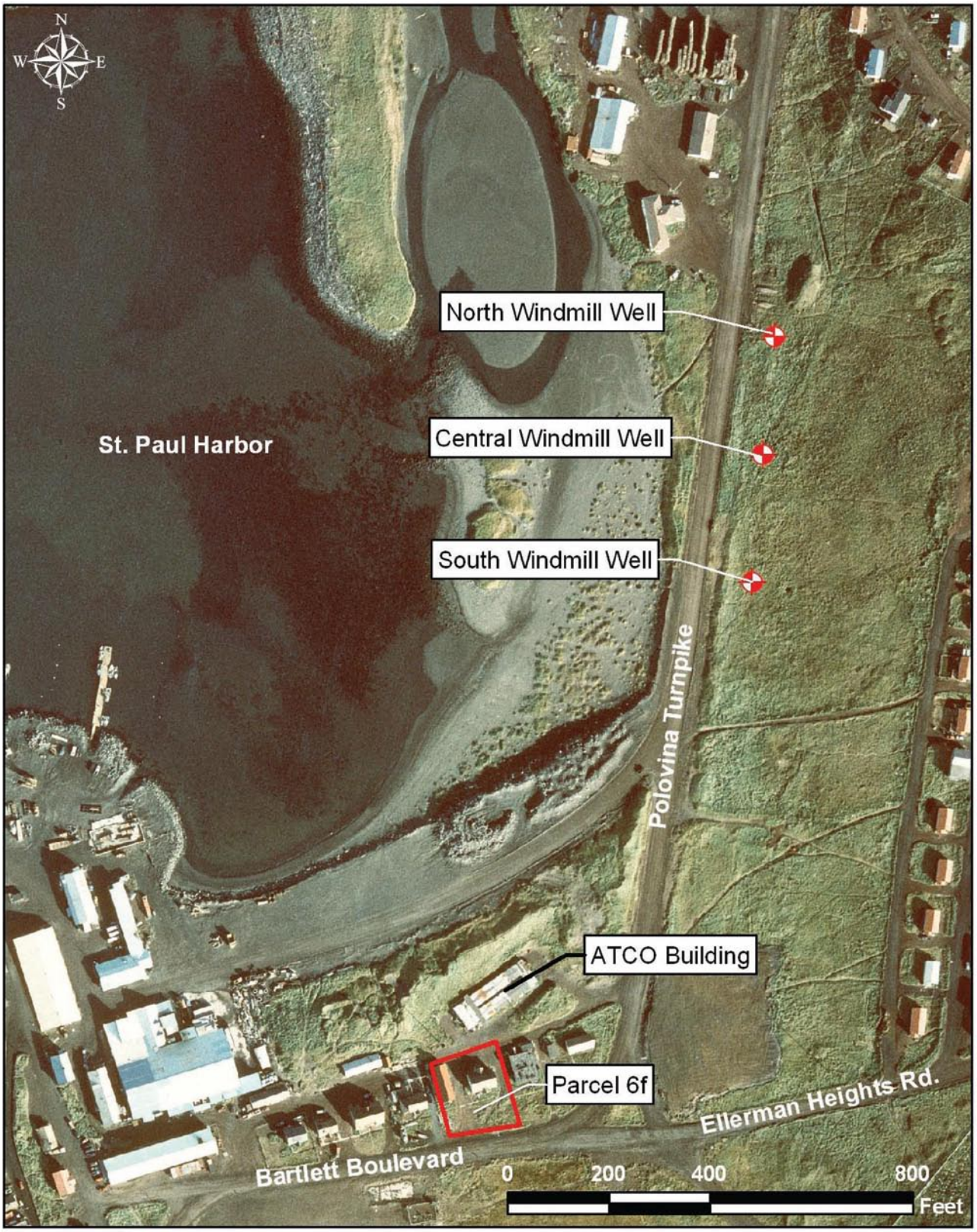


Figure 1	Locations of Sites and Structures of Interest St. Paul Island, Alaska	Sources: GIS Data (NOAA Pribilof Project GIS 2005), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

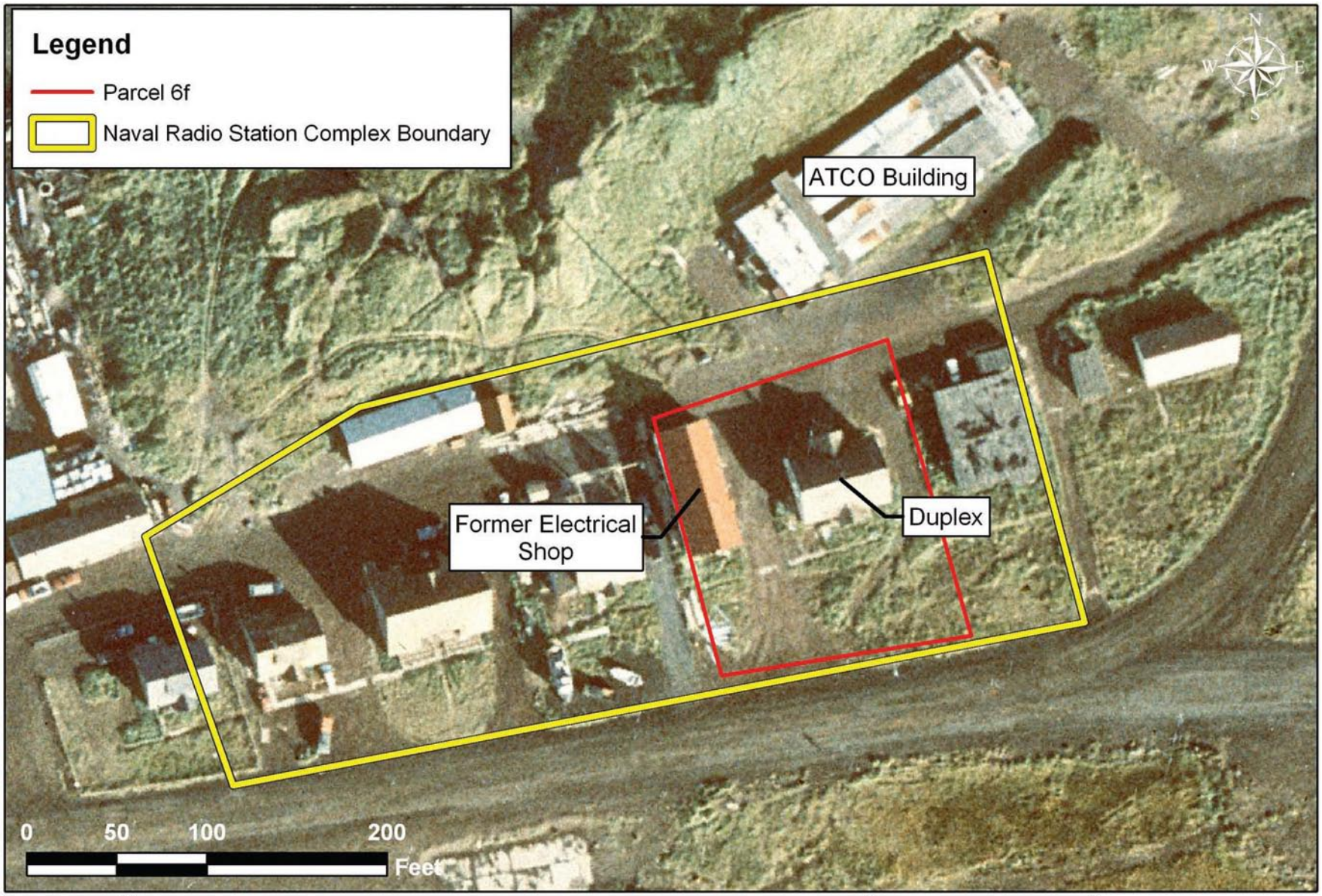


Figure 2	Parcel 6f and Vicinity St. Paul Island, Alaska	Sources: GIS Data (NOAA Pribilof Project GIS 2005), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

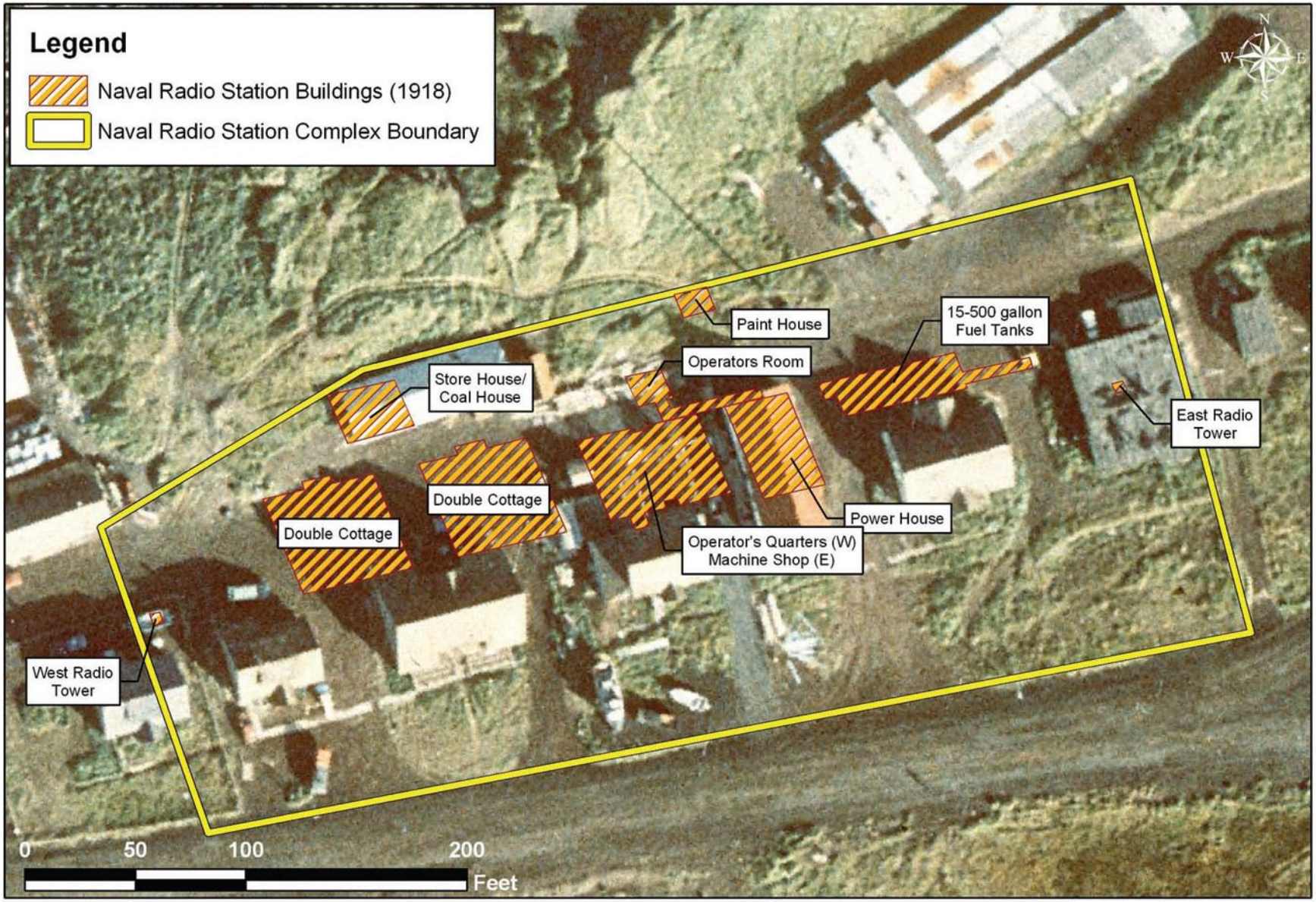
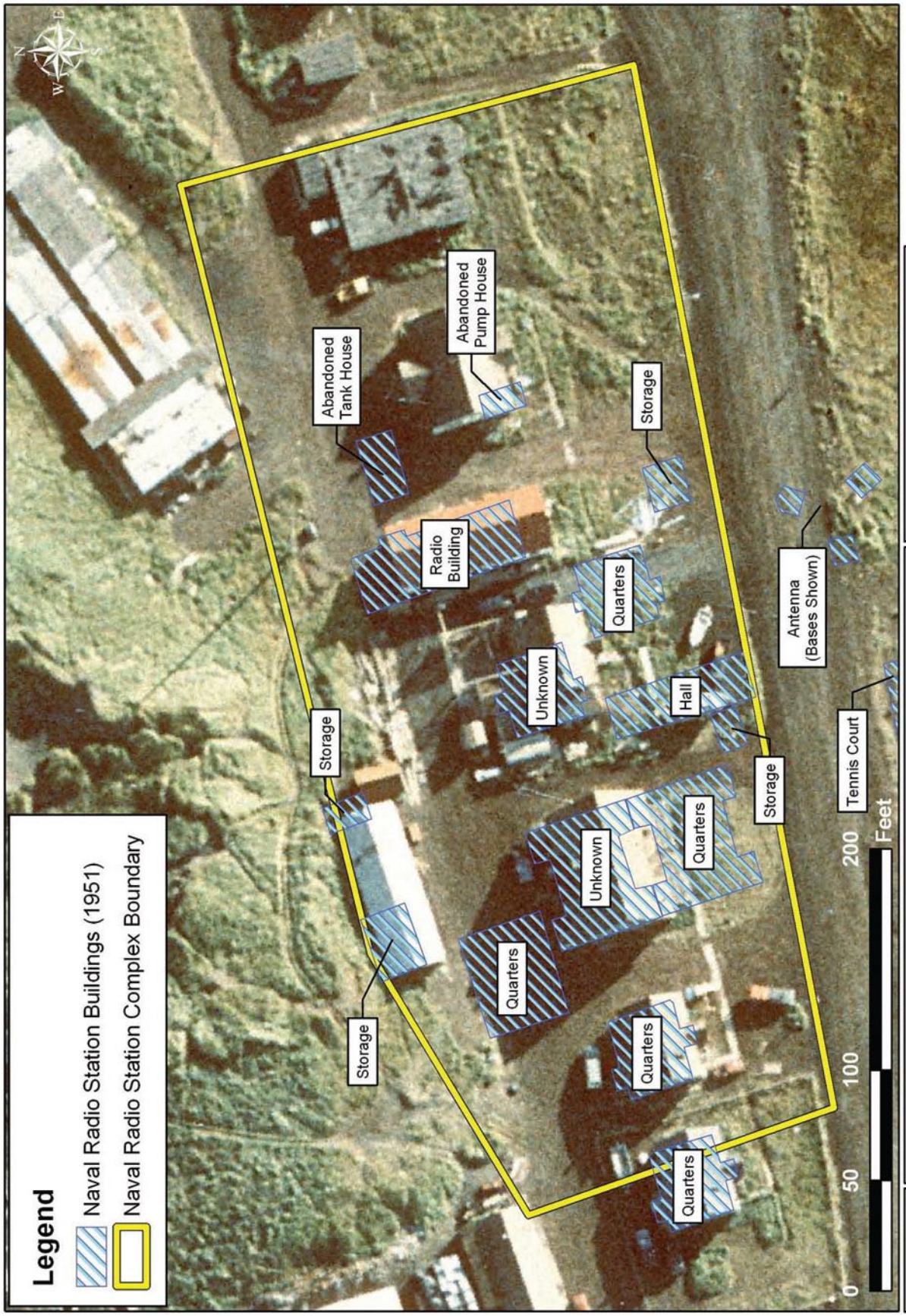


Figure 3	Naval Radio Station Complex, 1918 Formerly Used Defense Site St. Paul Island, Alaska	Sources: GIS Data (NOAA Pribilof Project GIS 2005), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project



Sources: GIS Data (NOAA Pribilof Project GIS 2005), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

Figure 4

Naval Radio Station Complex, 1951
Formerly Used Defense Site
St. Paul Island, Alaska

Figure 5	Photograph of the above ground storage tank farm that powered the electrical shop, ca. 1919.	Source: St. George Tanaq Corporation Collection.

Pribilof Islands Restoration Project

Figure 6	Aerial Photographs Parcel 6f and ATCO Building Vicinity St. Paul Island, Alaska	Sources: 1948 Photo (Victor B. Scheffer), 1967 Photo (unknown), 1982 Photo (BLM), 1993 Image (USGS DOQQ).

Pribilof Islands Restoration Project

Figure 7	Windmill Well Locations Formerly Used Defense Site St. Paul Island, Alaska	Sources: GIS Data (NOAA Pribilof Project GIS 2005), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

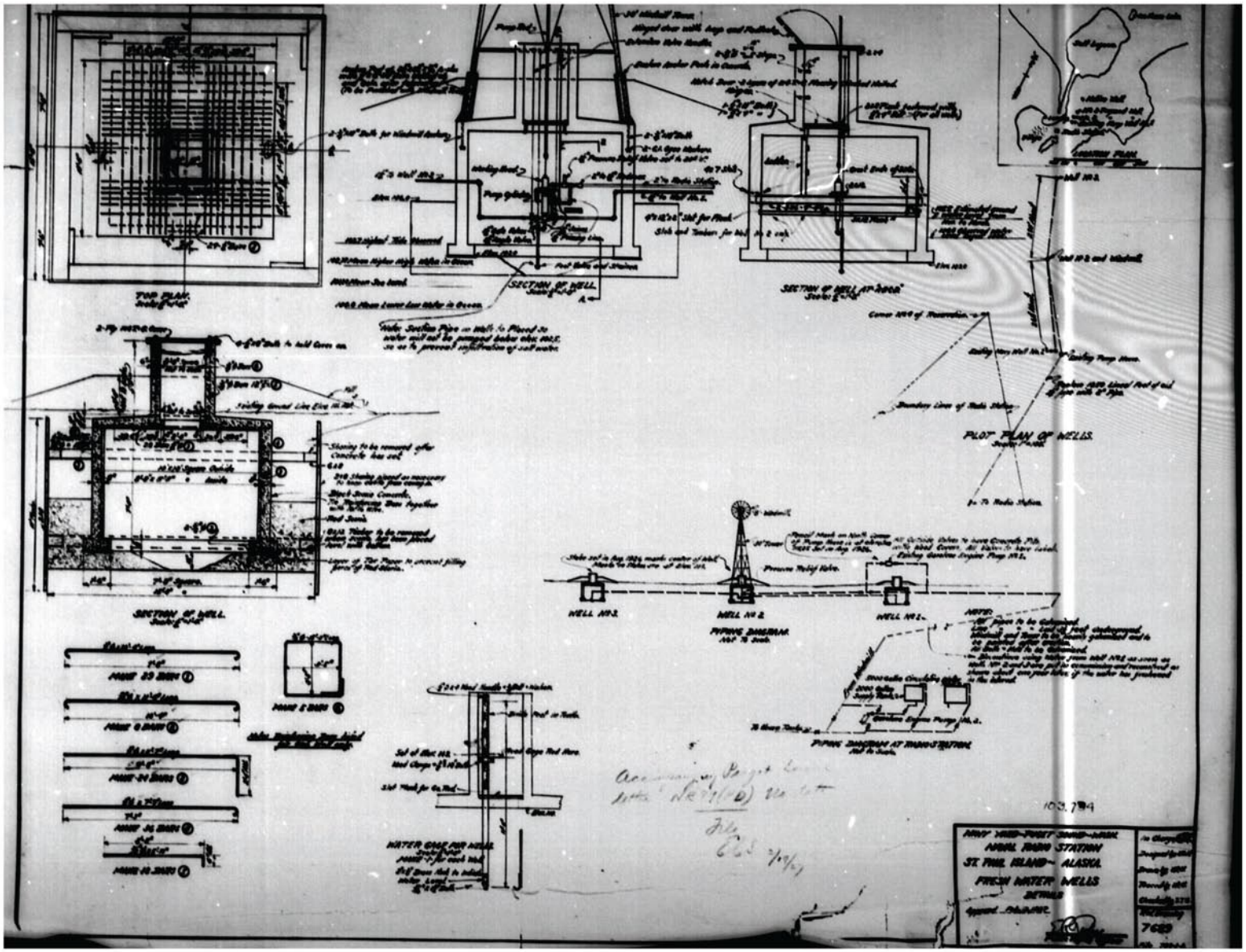


Figure 8	Fresh Water Wells Details 1927 Naval Radio Station St. Paul Island, Alaska	Source: NARA, Record Group 71, Series I, Reel 1124

Pribilof Islands Restoration Project

Figure 9	Photograph showing two windmills and towers built to support the St. Paul Island, Alaska Naval radio station water supply wells, 1930.	Source: NARA, College Park, MD.

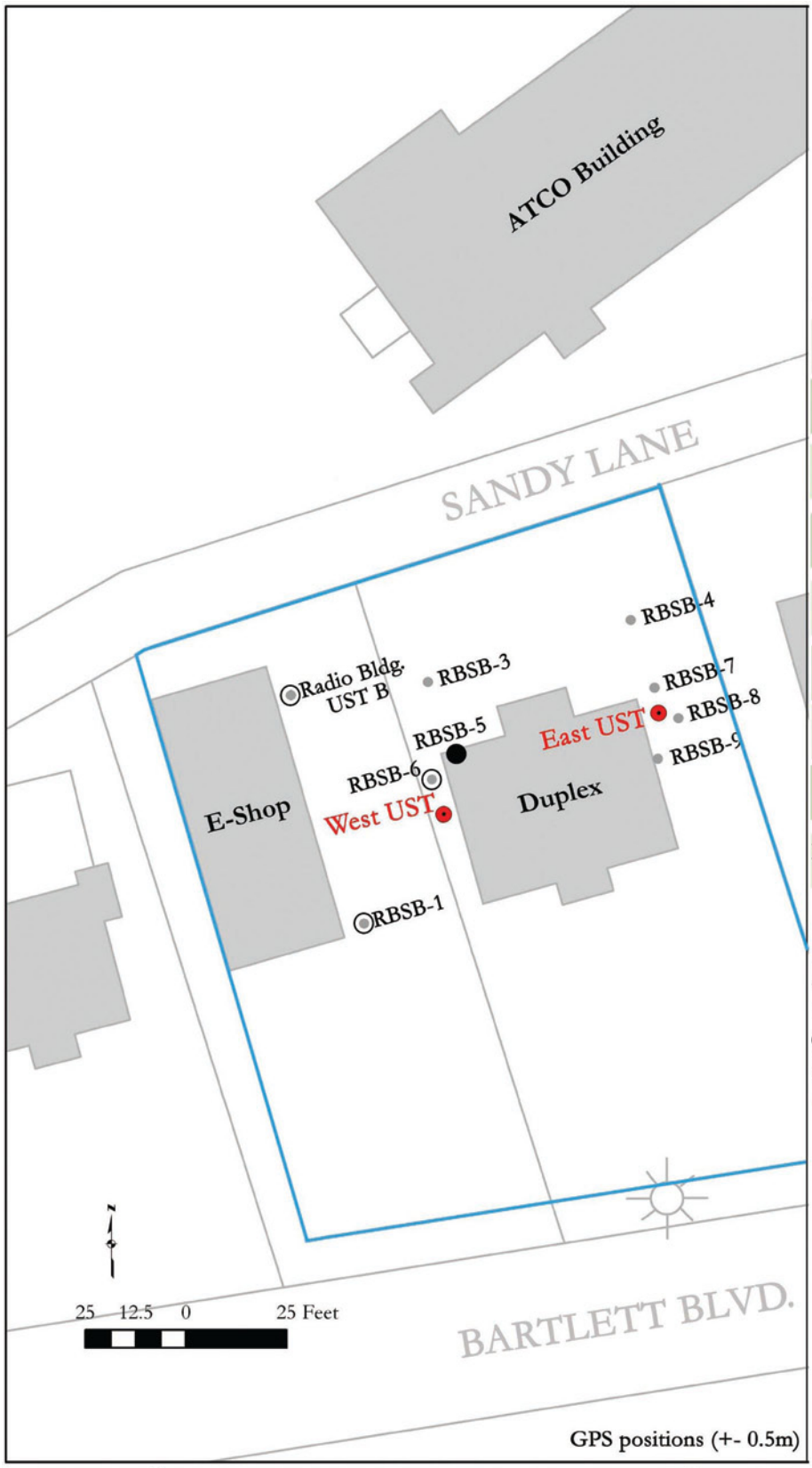


Table of Results

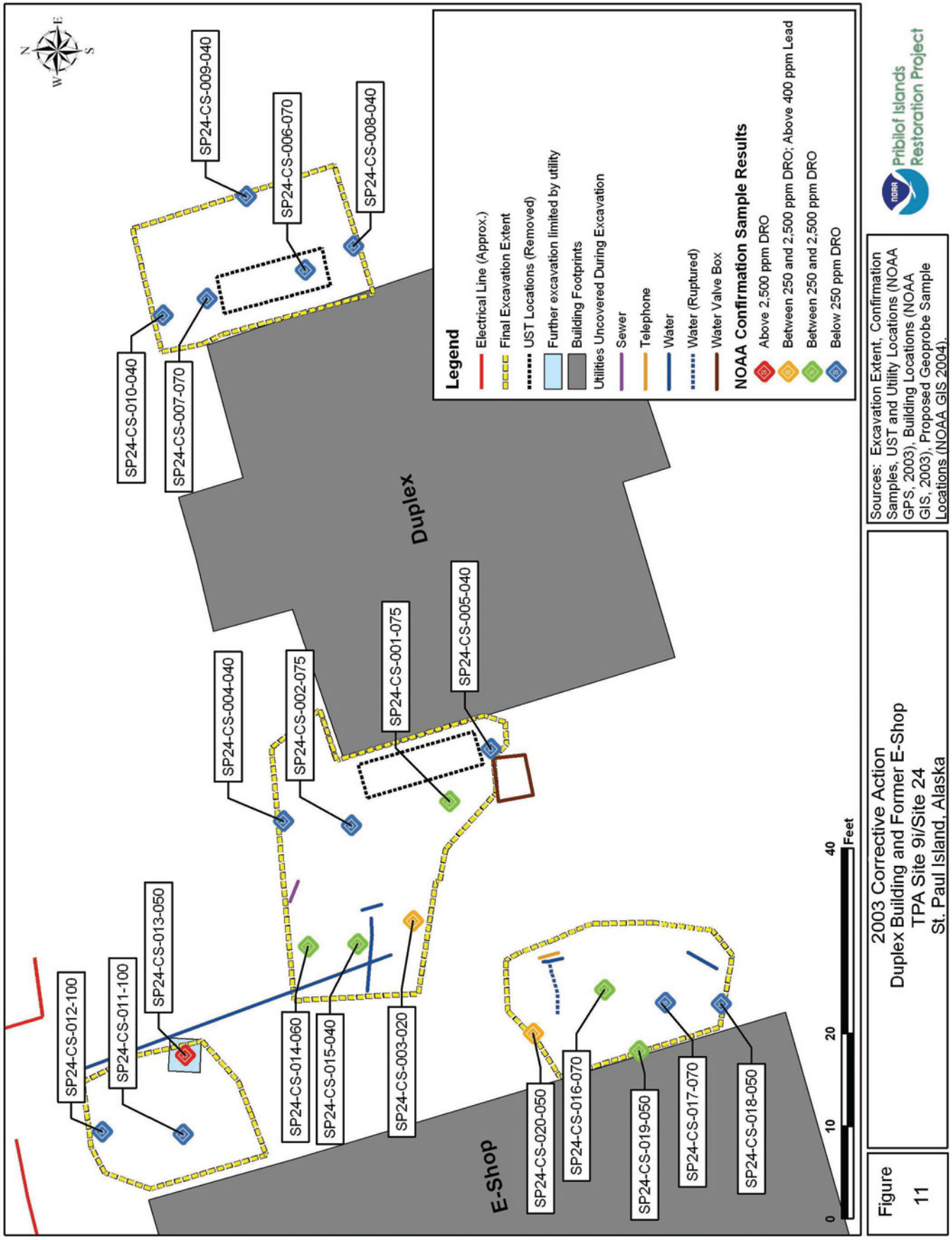
Sample Location	Depth Interval (feet bgs)	DRO (PPM)	RRO (PPM)
RBSB-1	6-8	260	400
RBSB-3	6-8 10-12	<10 29	<50 150
RBSB-4	8-10 10-12	11 <10	11 <10
RBSB-5	2-4 6-8	1500 830	15000 8700
RBSB-6	4-6 9-11	130 310	1100 260
RBSB-7	8-10	<10	<50
RBSB-8	6-8 10-12	12 <10	12 <50
RBSB-9	6-8 10-12	<10 13	<50 13
Radio Bldg UST B	5-6	480	4400

Legend

- Below Method Two
- DRO above Method Two
- DRO and RRO above Method 2
- Parcel 6f Boundary

Figure 10	2000 and 2001 Site Characterization Parcel 6f Soil Data St. Paul Island, Alaska	Sources: Boundaries and Buildings (Hart Crowser 1997), Sample Locations and Wells (NOAA Pribilof Project database, USTs are approximate only.)

Pribilof Islands Restoration Project


Legend
Electrical Line (Approx.)
Final Excavation Extent
UST Locations (Removed)
Further excavation limited by utility
Building Footprints
Utilities Uncovered During Excavation
Sewer
Telephone
Water
Water (Ruptured)
Water Valve Box
NOAA Confirmation Sample Results
Above 2,500 ppm DRO
Between 250 and 2,500 ppm DRO; Above 400 ppm Lead
Between 250 and 2,500 ppm DRO
Below 250 ppm DRO
Duplex
E-Shop
SP24-CS-009-040
SP24-CS-006-070
SP24-CS-008-040
SP24-CS-010-040
SP24-CS-007-070
SP24-CS-004-040
SP24-CS-002-075
SP24-CS-001-075
SP24-CS-005-040
SP24-CS-012-100
SP24-CS-011-100
SP24-CS-013-050
SP24-CS-014-060
SP24-CS-015-040
SP24-CS-003-020
SP24-CS-020-050
SP24-CS-016-070
SP24-CS-019-050
SP24-CS-017-070
SP24-CS-018-050
0
10
20
40
Feet
Sources: Excavation Extent, Confirmation Samples, UST and Utility Locations (NOAA GPS, 2003), Building Locations (NOAA GIS, 2003), Proposed Geoprobe Sample Locations (NOAA GIS 2004).
Pribilof Islands Restoration Project
2003 Corrective Action
Duplex Building and Former E-Shop
TPA Site 9i/Site 24
St. Paul Island, Alaska
Figure
11

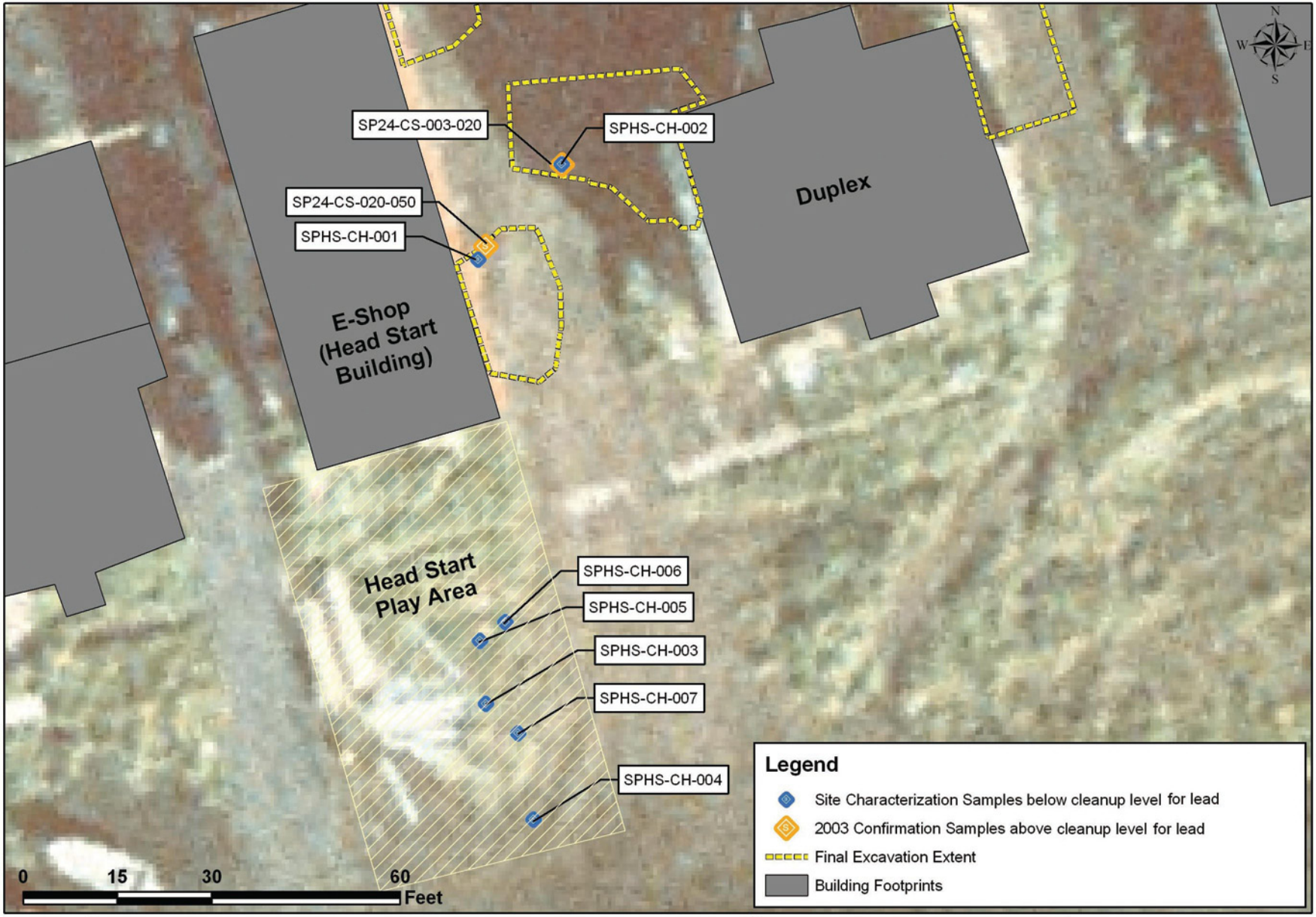
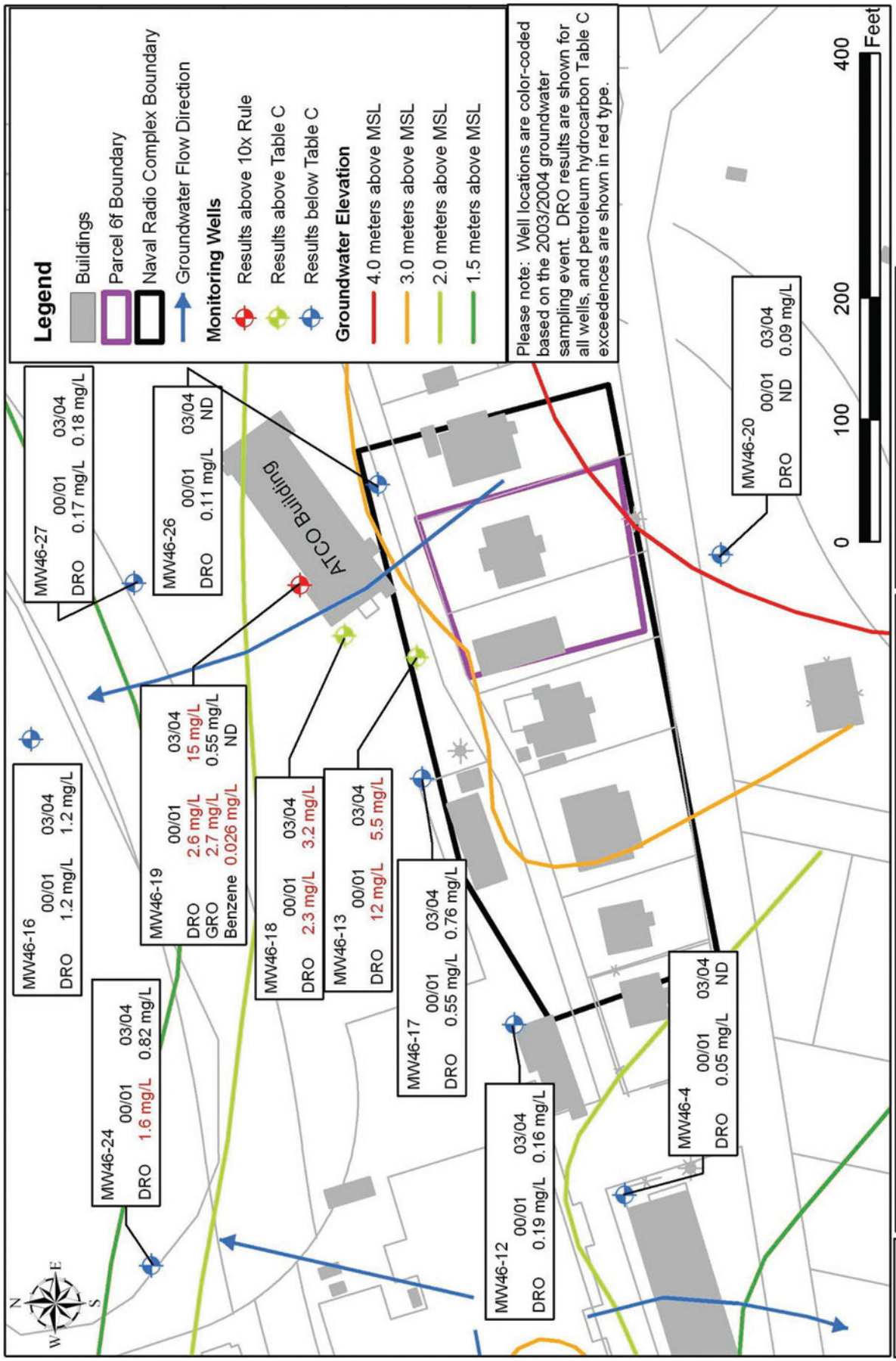


Figure 12

2004 X-Ray Fluorescence Site Characterization
Duplex Building and Former E-Shop
TPA Site 9i/Site 24
St. Paul Island, Alaska

Sources: Excavation Extent and Confirmation Samples (NOAA GPS 2003), Building Locations (NOAA GIS 2003), Site Characterization Sample Locations (NOAA GPS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project


Legend
Buildings
Parcel 6f Boundary
Naval Radio Complex Boundary
Groundwater Flow Direction
Monitoring Wells
Results above 10x Rule
Results above Table C
Results below Table C
Groundwater Elevation
4.0 meters above MSL
3.0 meters above MSL
2.0 meters above MSL
1.5 meters above MSL
Please note: Well locations are color-coded based on the 2003/2004 groundwater sampling event. DRO results are shown for all wells, and petroleum hydrocarbon Table C exceedences are shown in red type.
ATCO Building
MW46-27 DRO 00/01 0.17 mg/L 03/04 0.18 mg/L
MW46-26 DRO 00/01 0.11 mg/L 03/04 ND
MW46-20 DRO 00/01 ND 03/04 0.09 mg/L
MW46-16 DRO 00/01 1.2 mg/L 03/04 1.2 mg/L
MW46-19 DRO 00/01 2.6 mg/L 03/04 15 mg/L GRO 2.7 mg/L 0.55 mg/L Benzene 0.026 mg/L ND
MW46-18 DRO 00/01 2.3 mg/L 03/04 3.2 mg/L
MW46-13 DRO 00/01 12 mg/L 03/04 5.5 mg/L
MW46-17 DRO 00/01 0.55 mg/L 03/04 0.76 mg/L
MW46-24 DRO 00/01 1.6 mg/L 03/04 0.82 mg/L
MW46-12 DRO 00/01 0.19 mg/L 03/04 0.16 mg/L
MW46-4 DRO 00/01 0.05 mg/L 03/04 ND
N
E
S
W
0
100
200
400
Feet
Sources: Groundwater Elevation and Flow Direction (Mitretek 2005), Monitoring Well Locations and Boundaries (NOAA GIS 2005), Buildings (Hart-Crowser 1997).
Pribilof Islands Restoration Project
Groundwater Quality and Flow
Former Naval Radio Station Complex and Vicinity
St. Paul Island, Alaska
Figure
13

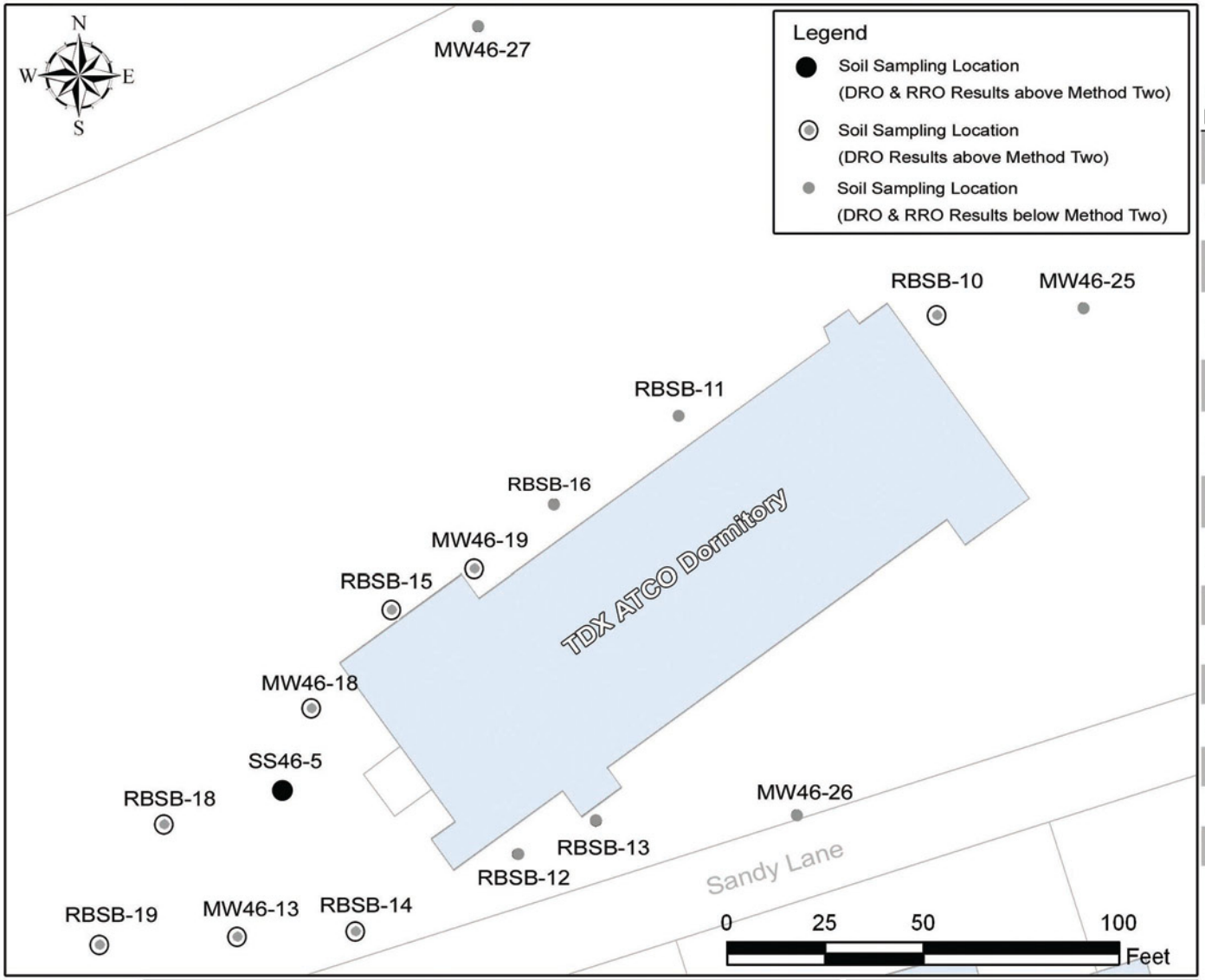


Table of Results

Sample Location	Depth Interval (feet bgs)	DRO (ppm)	RRO (ppm)
MW46-13	5-7	440	940
	14-16	4,500	2,500
MW46-18	6-8	400	450
	13-14	12,000	6,700
MW46-19	6-8	ND	ND
	10-12	27,000	540
MW46-25	6-8	ND	ND
	12-14	ND	ND
MW46-26	6-8	ND	ND
	12-14	ND	ND
MW46-27	6-8	ND	ND
	16-18	ND	ND
RBSB-10	6-8	17,000	ND
	14-16	10,000	140
RBSB-11	6-8	ND	ND
	12-14	ND	ND
RBSB-12	9-11	53	290
RBSB-13	11.5-13	ND	ND
RBSB-14	12-14	560	1,700
RBSB-15	14-16	8,000	180
RBSB-16	10-12	ND	ND
RBSB-18	12-14	2,300	1,300
RBSB-19	12-14	4,200	3,700
SS46-5	1	4,700	39,000

Figure 14

2000 ATCO Investigation
ATCO Building and Vicinity Soil Data
St. Paul Island, Alaska

Sources: Boundaries and Buildings (Hart-Crowser 1997), Sample Data (CESI 2000), Sample and Well Locations (Pribilof Project Database).

Pribilof Islands Restoration Project

Appendix I
Historic Correspondence and Documentation

TRANSFER OF U.S.NAVY RADIO STATION
TO BUREAU OF FISHERIES DEPT OF COMMERCE

On August 10,1937 the U.S.Navy Radio station was transferred to the Bureau of Fisheries,a copy of Inventory of equipment and supplies were turned over to the Agent and Caretaker of Island by Lieut.W.H.Tinsley Bremerton Navy Yard .

The entire Radio personnel boarded the U.S.Navy Supply vessel Sirius at 11.A.M.on August 12,1937,names as follows.

A.A.Daigle.....C.R.M.
D.C.McCallum.....C.M.M.
R.E.Reel.....R.M.1st Class.
John T Olson.....S.C.1st Class.
E.C.Hutter.....R.M.2nd Class.
R.E.Edberg.....R.M.2nd Class.
R.Barta.....R.M.2nd Class.

Mrs.F.Daigle.....Wife.
Mrs E.Reel.....Wife.
Robert Reel.....Son.
Rita Reel.....Daughter.
Mrs J.Hutter.....Wife.
Lois Hutter.....Daughter.
Patricia Hutter.....Daughter.
Robert Edberg.....Son.
Mrs E.Barta.....Wife.
Mrs M.Edberg.....Wife.

A seperate Inventory is being made up which will show what was transferred to Bureau of Fisheries.

17-21069

January 25, 1927

Honorable Curtis D. Wilbur,
Secretary of the Navy.

My dear Mr. Secretary:

The receipt is acknowledged of your letter of January 21, 1927, file L11-10/NC9 (270115), in regard to enlarging and improving the water supply for the Naval Radio Station on St. Paul Island, Alaska.

The Department of Commerce desires to cooperate as fully as possible in the proposed project. After having given careful consideration to the matter from the standpoint of your Department's plans and the ability of this Department to meet them, the following is submitted for your consideration.

1. Supplies and materials for the work to be shipped by the Navy Department to St. Paul Island as early as practicable in 1927.

2. The necessary labor at St. Paul Island to be performed by men temporarily employed there by the Bureau of Fisheries, their services for the time they are required by the Navy Department to be dispensed with by the Bureau of Fisheries. The wages of the men for the time that they are employed by the Navy Department to be paid by it through its own disbursing officers.

It is understood that the Navy Department has no disbursing officer at St. Paul Island but this fact need not interfere with the proposed method of payment for the reason that the payment of the wages may be deferred until the arrival of a naval supply vessel having a paymaster aboard which it is understood will reach St. Paul Island probably in August.

While it would be preferable that a representative of the Navy be at hand to oversee the execution of the work at St. Paul Island, the

Department of Commerce will in the absence of such a person, be pleased to have a competent employe of the Bureau of Fisheries render the necessary supervisory assistance.

Yours faithfully,

STEPHEN DAVIS

Acting Secretary of Commerce.

HDA:HH

Copy to Mr. Christoffer
1/28/27

Seattle, Washington
March 13, 1928

Mr. A. Christoffersen,
P. O. Box 602,
San Francisco, Calif.

Dear Mr. Christoffersen:

Mr. Miller of the Navy Yard was just over and wants us to dig another well for him this year. He states that the two wells built are working very satisfactory according to reports, but he thinks there should be one well 12x12 for emergency.

What do you think of it? Could you supervise the job in addition to operating the by-products plant? How many natives would it require and how long would it take? Mr. Miller thinks about 40 working days would complete the job.

Let me hear from you at an early date so I can notify him as to our decision.

Very truly yours,

Superintendent

HJC:ML

(1945)

	Brought forward.....	~~24,359.79~~ 25,404.71
1	Purifier, oil, Sharples No. 4A, serial No. 340-A409, driven by 440V 60 cycle 1 Hp motor	774.00
1	Electric heat unit, 6 KW, 440V, oil emersion type, with 3-heat snap switches	50.00
1	Element, heating, 6 KW, with snap switch	42.00
1	Starting switch, for use with 1 HP motor, GE-CR 1038 ZF switch No. 2019359 and 2thermal cutouts	5.90
1	Pump, rotary, 1/2", mounted on bedplate, connected to 1/4 HP, 1750 RPM motor	42.00
	Installation labor cost	375.00
	Total.....$	~~25,648.50~~ 26,692.61

Water Supply System & Equipment

1	Engine; gas, Fairbanks Morse, type Z, 15HP No. 462408	521.00
1	Hydrant; fire, No. 3 Eclipse, anti- freezing, 3" screwell connections	67.50
3	Posts; indicated, No. 520, for 3" & 4"	126.10
1	System; distribution, including 3200' of various sized iron pipe, 10,321' of 4" wood pipe, fittings hydrants, insulation, labor, etc.	19,414.67
4	Tanks; wood, water storage, fir 40,000 gal. cap. each, size 23' x 14'3"	2,800.00
1	Tank Foundation Timbers	266.66
1	Windmill; 12', model 24 Star, Timken bearings Hoosier deep-well working head, 4" suction, 2-1/2" discharge, 1 fig. 9222- 3-3/4 x 30" all brass working barrel, 4" nipples & plunger rod to connect working barrel directly below working handle	291.45

Radio Water Supply System & Equipment

1	System, water, cost included in tanks, windmills wells, etc.	.xx
4	Tanks; 10000 gal. steel, includes piping hydrants etc.	8,182.52
1	Well, water, No. 1, 12 x 12' square, inside,1928	1,000.00
1	Well, water, No. 2, 8 x 8' inside, 1927	1,000.00
1	Well, water, No. 3, 8 x 8' inside, 1927	1,000.00
2	Windmills, and towers,1929-33	270.00
1	Windmill, spare	130.00
1	Windmill Fan; 10-foot, W/engine parts	20.00
	Total.....$	35,089.90

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269–7552
Fax: (907) 269–7649
http://www.dec.state.ak.us/

File#: 2644.38.042
2644.38.040
2641.38.001

July 5, 2005

Mr. John Lindsay
Pribilof Project Office Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-6349

RE: Cleanup Needs and Responsibilities for Parcel 6f, the ATCO Building and the Windmill Wells on St. Paul Island June 2005

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (ADEC) received the above mentioned document on June 20, 2005. Based on a review of the information presented in the document, ADEC concurs that no further remedial action by the National Oceanic and Atmospheric Administration (NOAA) is necessary at the following sites:

1) Parcel 6f, which encompasses a duplex and the Former Electrical Shop (also known as the E-Shop), collectively known as Two Party Agreement Site 9i. It was previously referred to as Parcel 7 (housing and Airport Road shop) in the 1984 Transfer of Property Agreement. Lead contamination was detected above cleanup levels in the vicinity of the E-Shop in two locations at a depth of two feet and five feet. Lead was not found in the top one foot of soil at the E-Shop. Petroleum contamination at Parcel 6f is below, or in one sampling location in the vicinity of the E-Shop-just slightly above the alternative cleanup level of 2,500 mg/kg cleanup level for diesel range organics granted for the Village Area. Further removal of contaminated soil in these localized areas was hampered by underground piping and utilities. The site status in our contaminated sites database will be changed to No Further Remedial Action Planned.

   Any property transfer documents will need to reflect that residual contamination is present at the property and needs to be managed properly, if exposed in the future. Also, any off-site transport or disposal of contaminated soil excavated from the site requires approval from the Department in accordance with 18 AAC 75.325(i). Institutional controls (per 18 AAC 75.375(b)(c) for contaminated soil at Parcel 6f will be required if it is not already included in the "Village Area 10X rule" soil management strategy.

RECEIVED
JUL 11 2005

2) The ATCO Building petroleum release, which is located less than 50 feet northeasterly of Parcel 6f boundary on land owned by the Tanadgusix Corporation (TDX), appears to be the result of a recent fuel release by a private party. Therefore, ADEC is not requiring any additional characterization or cleanup action by NOAA at this site.

3) The Windmill Wells (associated with the Naval radio station complex) located along the east side of Polovina Turnpike just north of the current St. Paul post office. ADEC will coordinate with the Corps of Engineers (who will most likely work with local entities such as TDX and the City of St. Paul) on securing or decommissioning the wells, which may pose a physical hazard.

ADEC's decisions described above are based on the most current and complete information provided by NOAA.

Please contact me with any questions or concerns at (907) 269-7552.

Sincerely,

Louis Howard
Project Manager
Federal Facilities Section

G:\SPAR\SPAR-CS\38 Case Files (Contaminated Sites)\2644 St. Paul Island\2644.38.001 TDX ATCO Mancamp\05-Jul-2005 Parcel 6f ATCO Windmill wells FUDS Ltr.doc

NOAA Site 49
TPA Site 9n: Gas Station and Garage

Request for NFRAP, Gas Station and Garage, TPA Site 9n/Site 49,
St. Paul Island, Alaska 1201

Request for NFRAP
Gas Station and Garage, TPA Site 9n/Site 49
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site: Gas Station and Garage, also known as Two Party Agreement (TPA) Site 9n and National Oceanic and Atmospheric Administration (NOAA) Site 49. The site will be referred to as the "site" herein.

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. On the island, the site is situated in St. Paul Village near St. Paul Harbor (Figures 1 and 2), approximately 250 feet (ft) northwest of the Cascade Building (57°07'25.88" North Latitude, 170°16'53.25" West Longitude).

Legal Property Description: The area of excavation is located in Tract 46, Township 35 South, Range 132 West, of the Seward Meridian, Alaska, as shown on the dependent resurvey of a portion of U.S. Survey No. 4943, Alaska, Tract "A", St Paul Townsite, officially filed June 3, 1997 (Figure 2). [Note: TPA site boundaries are not defined in the TPA. At its discretion, NOAA established a boundary for this TPA site based on site characterization data and historic information.] NOAA owns the site.

Type of Release: Potential release mechanisms include: 1) leaks associated with the storage of diesel fuel in one underground storage tank (UST); and 2) leaks associated with fuel dispensation at the gas station.

History and Background:
The site is located in St. Paul Village near St. Paul Harbor, approximately 200 ft northwest of the Cascade Building and 100 ft northeast of the Municipal Garage (Figures 3 and 4). An UST serviced a former fuel station located on the site (BESC 1997). The 300-gallon capacity tank stored gasoline. The period of use for the gas station is not known, however the gas station's garage building is evident in a 1943 aerial photograph, and the gas station was no longer in service by the mid-1990s when a site investigation was performed at the site (Hart Crowser 1997).

The site is currently used for storage of small boats by local fisherman, and is within the industrial area of St. Paul Village (Figure 4).

Summary of Site Investigations:
In 1995, Hart Crowser collected soil samples to assess the nature and extent of chemical contamination in soils at several locations on St. Paul Island, including the site (Hart Crowser 1997). A hand auger boring (HA-6) provided a single sample at 0.5 ft below ground surface (bgs); refusal at 1.8 ft bgs prohibited deeper auger penetration. Additional samples came from a test pit (TP-11) at depths ranging from 0-4.5 ft bgs (Figure 3). All samples were analyzed in a field laboratory and in an off-site project laboratory, with analyses and results as indicated in Table 1.

Hart Crowser's field laboratory detected residual-range organics (RRO), quantified as "oil," at a maximum concentration of 5,200 milligrams per kilogram (mg/kg), less than the ADEC Method Two cleanup level of 10,000 mg/kg (Figure 3). No other contaminants were detected in the samples analyzed by the field laboratory.

The off-site project laboratory detected gasoline-range organics (GRO) in sample HA-6/S-1 at 2.1 mg/kg and 1.6 mg/kg in TP-11/S-1, which are below the ADEC Method Two cleanup level of 300 mg/kg. Total petroleum hydrocarbons (TPH) were detected in sample HA-6/S-1 at 2,100 mg/kg, which contrasts with the 5,200 mg/kg concentration detected by the field laboratory noted above. ADEC Method Two does not provide a cleanup level for TPH. No other contaminants were detected in the samples analyzed by the off-site project laboratory.

In 2000 and 2001, Columbia Environmental Sciences Inc. (CESI) installed groundwater monitoring wells and took soil borings in the City of St. Paul as part of a site characterization effort (CESI 2001). No wells were installed at this site, and consequently no soil samples were collected from this site. Monitoring wells were installed both upgradient (MW46-10, MW46-28) and downgradient (MW46-14) of the site (Figures 4 and 5).

NOAA contractors conducted quarterly groundwater monitoring from September 2000 to September 2001 and from October 2003 to July 2004 in the vicinity of the site. Groundwater in the vicinity of the site is thought to flow northerly away from the site, toward St. Paul Harbor (Figure 5), according to Mitretek Systems (Mitretek 2002). DRO, GRO and benzene exceeded ADEC Table C cleanup criteria in wells MW46-10 and MW46-28, upgradient of the site; toluene also exceeded its cleanup criterion in MW46-28. DRO detections in well MW46-14, downgradient of the site, did not exceed the most stringent Table C cleanup criterion of 1,500 µg/L during 2003-2004 sampling (Figure 4).

No other contaminants were found at these wells above their ADEC Table C cleanup levels. One should note that these wells are within or potentially downgradient of other source areas including TPA Site 9e (Municipal Garage/ Machine Shop) and TPA Site 9f (Cascade Building).

Mitretek Systems (2002) evaluated the 2000-2001 groundwater data for the St. Paul Village area, which includes the site. The Mitretek report demonstrated that groundwater in the vicinity of St. Paul Village has high total dissolved solids and can be brackish. Consequently, the groundwater in the area is not suitable for drinking water. The evaluation, in part, provided a rationale for using alternative groundwater cleanup levels that are protective of human health and the environment where the groundwater is not potable. Mitretek concluded in accordance with 18 AAC 75.350 (ADEC 2003a) that groundwater in the Village area is not currently used and does not afford any potential future use as a drinking water source.

These findings provided the basis for the application of the Ten Times Rule discussed below.

Summary of Applied Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2003a). Alternative cleanup levels were also applied for some compounds. For benzene, under the TPA, NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). Additionally, NOAA proposed and ADEC approved the use of alternative cleanup levels under 18 AAC 75.345 and 18 AAC 75.350, commonly referred to as the Ten Times Rule (ADEC 2002, Mitretek Systems 2002). According to these regulations, if groundwater beneath a site contains contaminant concentrations above the cleanup levels provided in ADEC Table C, then the soil may be remediated to levels ten times higher than those provided in Method Two Tables B1 and B2 for the migration to groundwater pathway for those contaminants found in groundwater at concentrations above the cleanup levels provided in ADEC Table C; however, if the inhalation or ingestion pathway values are more stringent than the migration to groundwater pathway, then the more stringent value is to be applied. ADEC uses 15 feet below ground surface (bgs) to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2003a; 18 AAC 75.340 (j)(2)). Therefore NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 feet to address the inhalation and ingestion pathways. Cleanup criteria were applied to the maximum extent practicable (18 AAC 75.325 (f), 18 AAC 75.990).

Summary of Cleanup Actions:
Corrective action activities for the site were performed in July 1997 (BESC 1997). The gasoline UST was accessed and found to contain approximately 10 gallons of residual fluids, which were removed from the tank and reused as fuel on island. The 300 gallon UST was removed from the site and cleaned, then was decommissioned by disposal off-island consistent with ADEC regulations. The excavation remaining from the UST removal was approximately 7 ft by 5 ft laterally and extended 5 ft bgs. The soil surrounding the UST was damp, brown, poorly graded sand with silt and gravel. A photo-ionization detector was used to screen the soil in the tank excavation, and the readings were zero units (*i.e.* no instrument deflection) throughout the excavation (BESC 1997). During this corrective action, no PCS was removed from the excavation at the site.

Two confirmation samples were collected from the bottom of the excavation and the test pit for laboratory analyses including benzene, toluene, ethylbenzene, and total xylenes (BTEX); GRO; and total lead (Figure 6). Specifically, sample 300F was collected about 1 ft below the fill end of the UST and sample 300C was collected about 1 ft below the center of the UST.

Table 1 provides a summary of the confirmation sampling data. Confirmation samples collected from the excavation at the site indicated all contaminants of concern were below the ADEC Method Two cleanup levels in the confirmation samples. Thus, the site was remediated as a clean closure with no land use restrictions necessary for the vadose zone soil. Site contamination has not impacted groundwater at or in the vicinity of the site.

Laboratory reporting limits were below ADEC Method Two cleanup levels for all contaminants except benzene. For benzene, reporting limits of 0.025 mg/kg or lower were achieved, which is above the ADEC Method Two cleanup level of 0.02 mg/kg, but below the alternative cleanup level of 0.5 mg/kg.

The excavation was backfilled following the collection of fixed laboratory confirmation samples. Backfill operations involved transporting clean fill material from an on-island source, though the actual borrow material source is not known (BESC 1997). The area of excavation was restored to its original grade.

Recommended Action:

In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action at the Gas Station and Garage, TPA Site 9n/NOAA Site 49 in accordance with the Agreement and that ADEC requires no further remedial action plan from NOAA.

References:

Alaska Department of Environmental Conservation (ADEC). 1991. Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Contaminated Sites Program. July 17, 1991.

ADEC. 2002. Letter from Louis Howard, Project Manager, Alaska Department of Environmental Conservation, to John Lindsay, Project Manager, NOAA Pribilof Project Office regarding ADEC conditional approval for applying the Ten Times Rule. May 30.

ADEC. 2003a. Title 18 of the Alaska Administrative Code 75, Articles 3 and 9. Oil and Hazardous Substances Pollution Control Regulations. State of Alaska. January 30.

ADEC. 2003b. 18 AAC 78. Underground Storage Tanks. State of Alaska. January 30.

Bristol Environmental Services Corporation (BESC). 1997. UST Removal and Closure Report, St. Paul Island, Alaska, 300 Gallon UST, Facility Identification Number 3048, UST Number 7. BESC. September 24.

Columbia Environmental Sciences, Inc. 2001. Draft Site Characterization Report, Tract 46 and Vicinity (TPA Site 9), St. Paul Island, Alaska. Version 2.1. CESI. Kennewick, WA. December 16.

Hart Crowser, Inc. 1997. Expanded Site Inspection of St. Paul Island, Pribilof Islands, Alaska. January.

IT Alaska Corporation. 2002. Draft Annual Groundwater Monitoring Report 2001, St. Paul Island, Alaska. March.

Mitretek. 2002. Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska. Prepared by Mitretek Systems, for the National Oceanic and Atmospheric Administration. June 5.

National Oceanic and Atmospheric Administration (NOAA). 1996. Pribilof Islands Environmental Restoration Two Party Agreement. Attorney General's Office File No. 66 1-95-0126, National Oceanic and Atmospheric Administration. January 26.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

9/30/04
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at the Gas Station and Garage, TPA Site 9n/NOAA Site 49, in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

10/11/04
Date

Tables and Figures

Table 1. Analytical Data Summary for Samples from the Gas Station and Garage, TPA Site 9n/NOAA Site 49, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	TPH (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
NOAA Site 49/TPA Site 9n Characterization Samples										
TP-11/S-1 (FL)	1.5	0.05 U	0.05 U	0.05 U	0.05 U	--	10 U	20 U	450	--
TP-11/S-1 (PL)	1.5	--	--	--	--	--	1.6	--	--	--
TP-11/S-2 (FL)	4.5	--	--	--	--	--	10 U	20 U	50 U	--
TP-11/S-2 (PL)	4.5	--	--	--	--	27 U	--	11 U	--	--
HA-6/S-1 (FL)	0.5	0.05 U	0.05 U	0.05 U	0.05 U	--	10 U	20 U	5,200	--
HA-6/S-1 (PL)	0.5	--	--	--	--	2,100	2.1	--	--	--
NOAA Site 49/TPA Site 9n Corrective Action Confirmation Samples										
300C (PL)	5	0.02 U	0.02 U	0.02 U	0.02 U	--	2	--	--	20
300F (PL)	5	0.02 U	0.02 U	0.02 U	0.02 U	--	1 U	--	--	20
ADEC Method Two Cleanup Level[a]		*0.02*	*5.4*	*5.5*	*78*	*NA*	*300*	*250*	*10,000*	*400*[d]
Alternative Cleanup Level[b]		*0.5*[c]	*54*	*NA*	*NA*	*NA*	*1,400*	*2,500*	*NA*	*NA*

Notes:

bold Indicates concentration above cleanup levels. Although reporting limits for benzene sometimes exceeded the ADEC Method Two cleanup level of 0.02 mg/kg, reporting limits did not exceed the alternative cleanup level of 0.5 mg/kg.

ADEC Alaska Department of Environmental Conservation

bgs Below ground surface

BTEX Benzene, toluene, ethylbenzene, and total xylenes

DRO Diesel-range organic compounds

FL	Field Laboratory Result
GRO	Gasoline-range organic compounds
J	Analyte was positively identified, but concentration is estimated; result is considered qualitatively acceptble, but quantitatively unreliable.
mg/kg	Milligram per kilogram
--	Not analyzed
NA	Not available
PL	Project (*i.e.* Fixed) Laboratory Result
RRO	Residual-range organic compounds
TPA	Two-Party Agreement
U	The analyte was analyzed for, but was not detected above the sample reporting limit.
a	Cleanup level is from Title 18 of the *Alaska Administrative Code* 75 "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000. Contaminants of concern for this site are limited to
b	Cleanup level obtained from ADEC Method Two based on the 1991 cleanup level, as referenced in Section 5.0 of the corrective action plan (National Oceanic and Atmospheric Administration [NOAA] 2003a).
c	Under the TPA, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg).
d	Although this site is located in an industrial area, NOAA is using the residential cleanup level for lead (400 mg/kg).

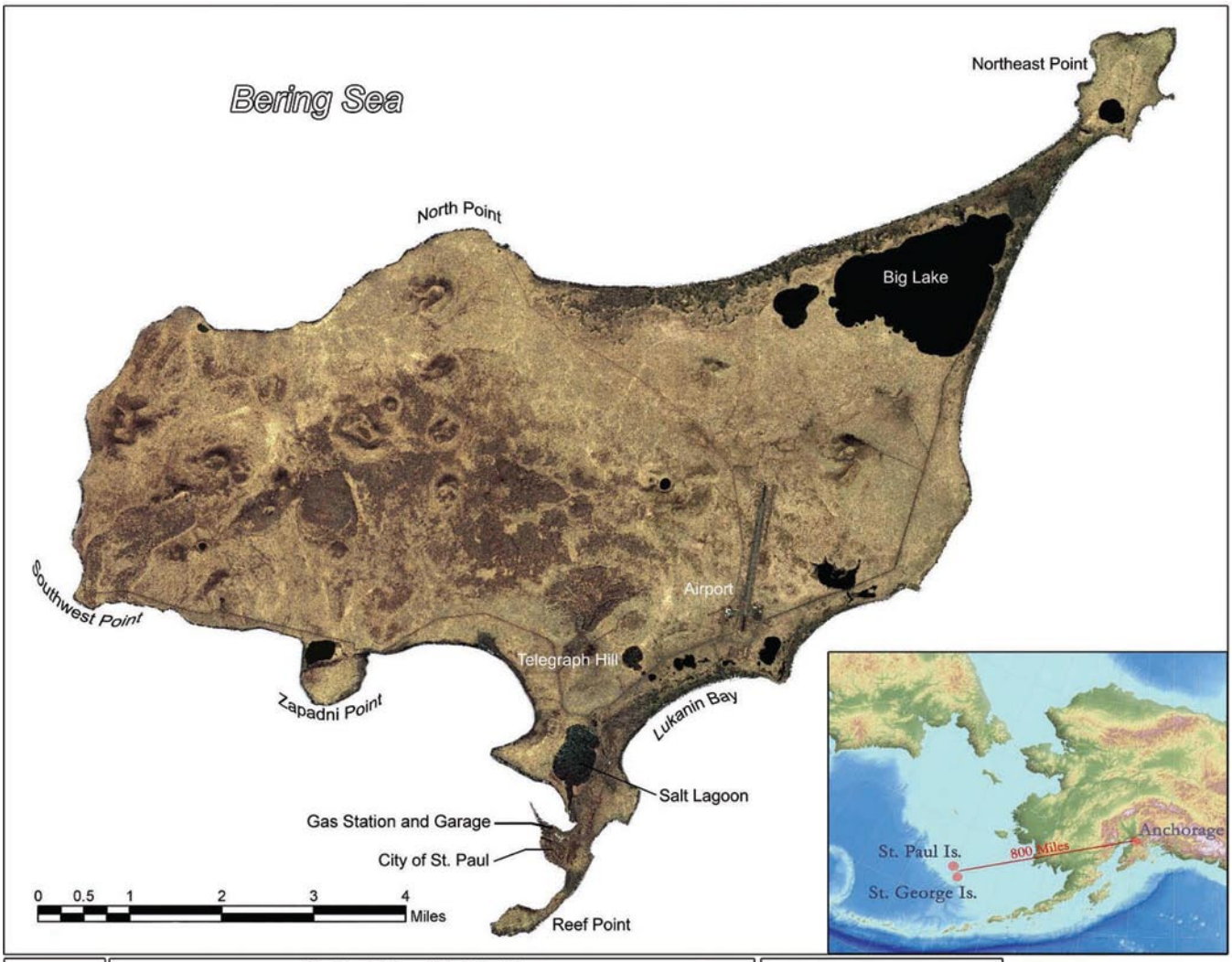


Figure 1	St. Paul Island Vicinity Map Gas Station and Garage NOAA Site 49/TPA Site 9n St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001	Pribilof Islands Restoration Project

Figure 2	Legal Property Description Map Gas Station and Garage NOAA Site 49/TPA Site 9n St. Paul Island, Alaska	Sources: BLM Tracts (BLM MTPs 1983), TPA 9n Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

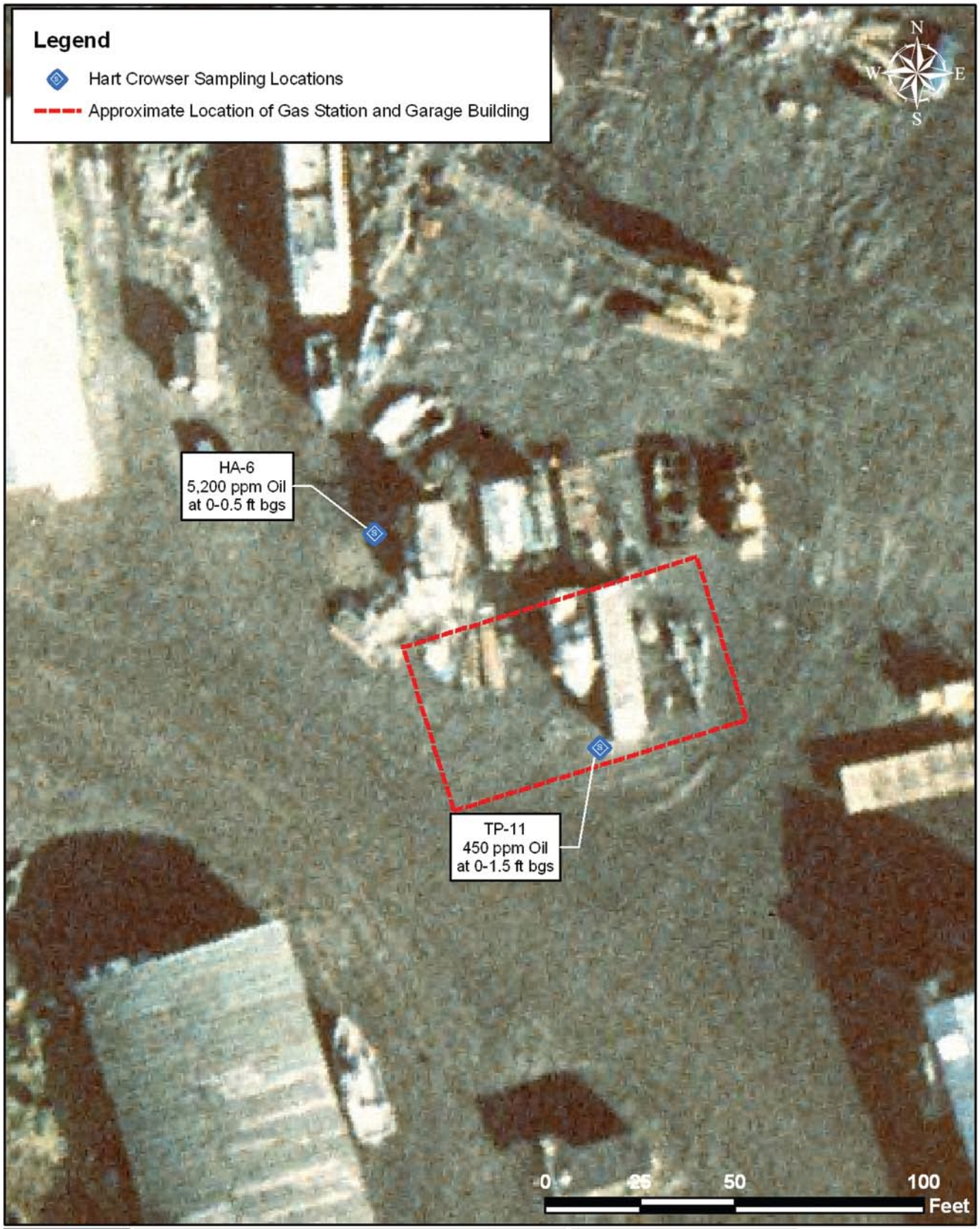


Figure 3	Historical Sampling Locations Gas Station and Garage NOAA Site 49/TPA Site 9n St. Paul Island, Alaska	Sources: Building and Sample Locations (Hart Crowser 1997), Aerial Photo (Aeromap US 1996).	Pribilof Islands Restoration Project

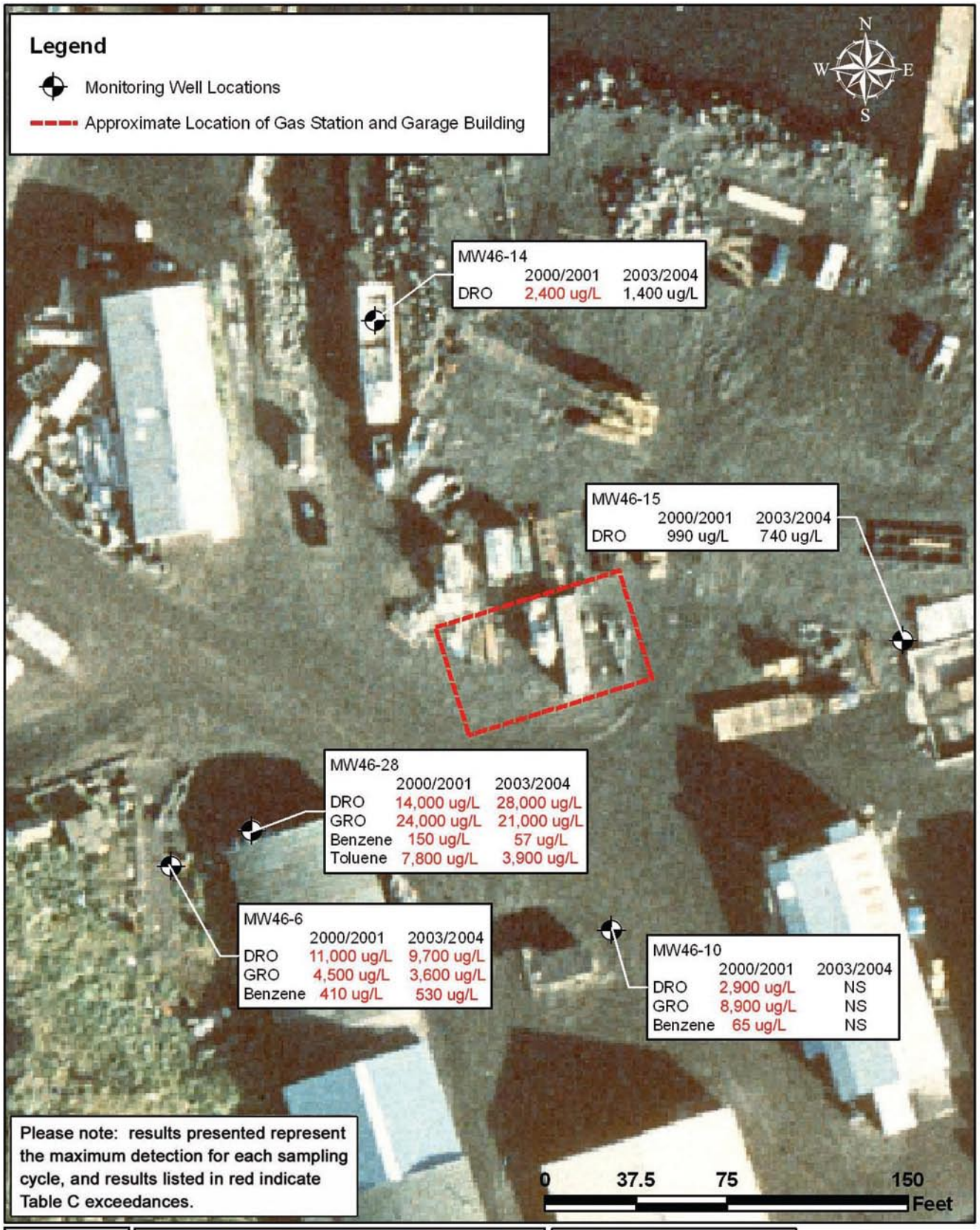
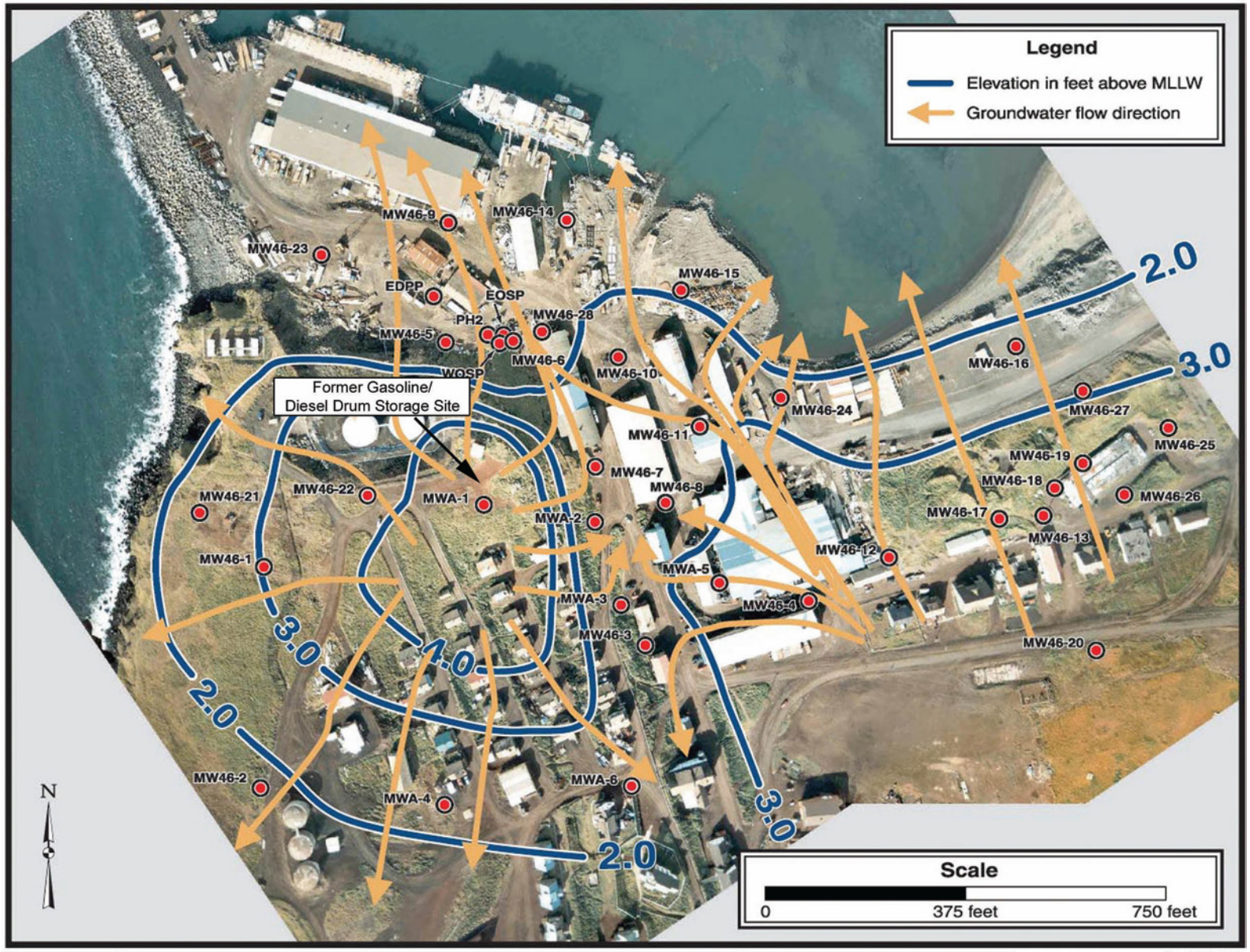


Figure 4	Groundwater Sampling Results Gas Station and Garage NOAA Site 49/TPA Site 9n St. Paul Island, Alaska	Sources: Building Location (Hart Crowser 1997), Well Locations (NOAA GPS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project



From CESI 2001b

Figure 5	Mean Groundwater Level Contours and Flow Direction Gas Station and Garage NOAA Site 49/TPA Site 9n St. Paul Island, Alaska	Source: Mitretek, 2002.	Pribilof Islands Restoration Project

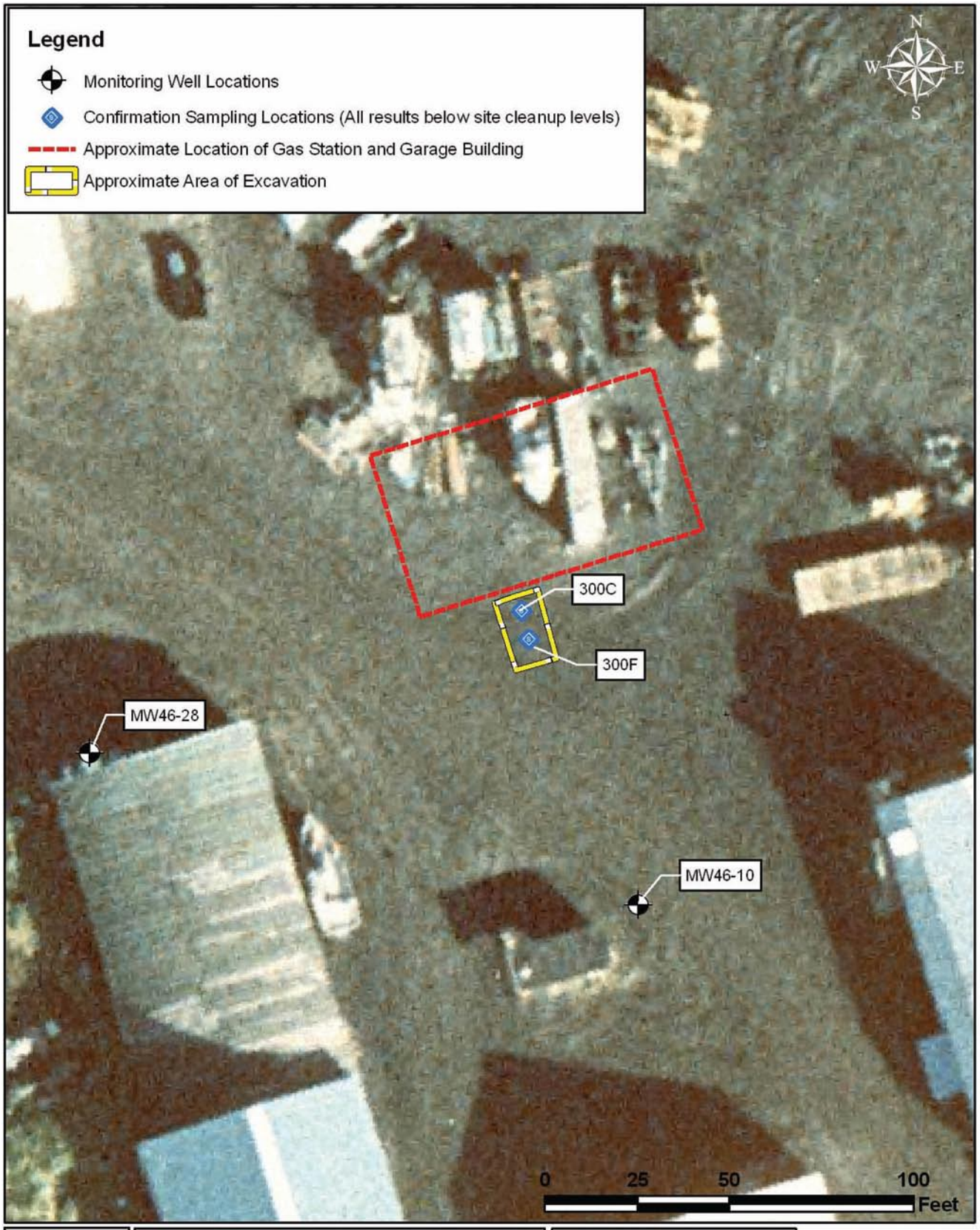


Figure 6	Area of Excavation and Confirmation Sampling Results Gas Station and Garage NOAA Site 49/TPA Site 9n St. Paul Island, Alaska	Sources: Building Location (Hart Crowser 1997), Well Locations (NOAA GPS 2004), Excavation Extent and Sampling Locations (Bristol Environmental 1997), Aerial Photo (Aeromap US 1996).	Pribilof Islands Restoration Project

NOAA Site 50
TPA Site 9o: Former Gasoline/ Diesel Drum Storage

Request for NFRAP Former Gasoline/Diesel Fuel Drum Storage Site, TPA Site 9o/Site 50, St. Paul Island, Alaska 1213

Letter from Louis Howard to John Lindsay RE: Request for No Further Remedial Action Planned Determination Former Gasoline/Diesel Fuel Drum Storage Site, TPA 9o Site 50, St. Paul Island October 2004. Dated October 11, 2004 1227

Notice of Environmental Cleanup and Residual Soil and Groundwater Contamination at TPA09o, Gas/Diesel Drum Storage, St. Paul Island, Alaska.1229

Request for NFRAP
Former Gasoline/Diesel Fuel Drum Storage Site, TPA Site 9o/Site 50
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site: Former Gasoline/Diesel Fuel Drum Storage Site, also known as Two Party Agreement (TPA) Site 9o, National Oceanic and Atmospheric Administration (NOAA) Site 50, the Former Gasoline/Diesel Drum Storage Area, the Former Drum Storage Site (DSS), the Former Drum Storage Area (DSA), and the Barrel Storage Area. The site will be referred to as the Former DSS herein.

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. On the island, the Former DSS is situated in St. Paul Village atop Village Hill (Figures 1 and 2), west of the Machine Shop building (57°07'22.18" North Latitude, 170°16'56.74" West Longitude).

Legal Property Description: The area of excavation is located in Tract 3, Township 35 South, Range 132 West, of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986 (Figure 2). Tanadgusix Corporation (TDX) purportedly owns the property. [Note: TPA site boundaries are not defined in the TPA. At its discretion, NOAA established a boundary for this TPA site based on site characterization data and historic information. The boundary for this site extends beyond the area of excavation but is found wholly within the Tract 3 property described above.]

Type of Release: Potential release mechanisms include: 1) leaks associated with the storage of 55-gallon fuel storage drums; 2) spills associated with the manual fuel transfers from storage drums to above ground fuel transfer pipelines; and 3) leaks associated with fuel transfers in the pipelines.

History and Background:
The Former DSS is located on the northeastern prominence of Village Hill (Figures 3 and 4) about 150 feet (ft) west of the Machine Shop, 150 ft northwest of the AST Saddle Complex (TPA Site 9k/NOAA Site 26), and 900 ft east of the Former Diesel Tank Farm site (TPA 11/NOAA Site 30).

Drums of gasoline and diesel stored on the Former DSS filled the tanks at the AST Saddles Complex using a funnel and pipelines. According to Hart Crowser (1997), 55-gallon drums of gasoline and diesel fuels were reportedly stored at this site prior to the 1960's. Based upon an interview with a former island employee, Hart Crower stated that a funnel fabricated from a 55-gallon drum allowed for the emptying of fuel drums. An archived photo from the 1950's (Figure 5) suggests that a large tank with a ramp leading onto it was used to dump the fuels. Regardless, gravity transported diesel fuel through above ground pipelines running easterly and downslope to a former above ground storage tank (AST) complex currently known as the AST Saddle Complex (Figure 4). Other than a schematic depicting "Existing Barrel Storage Area" prepared in 1959, NOAA has not yet found any historical aerial or ground view photodocumentation demonstrating activities at the Former DSS. The PCS found at the site by Hart Crowser (1997) is thought to result from spillage or leakage during storage and transfer operations.

Once fuel transfer operations at the site ceased, the pipelines served the City as an electrical conduit. The Former DSS is located in a recreational area of St. Paul Village, but in close proximity to residences and the industrial area (Figure 4).

Summary of Site Investigations:
Hart Crower (1997) excavated nine (9) test pits (TP) in the vicinity of the Former DSS (Figure 3) to characterize the extent of soil contamination due to diesel range organics (DRO), gasoline range organics (GRO), residual range organics (RRO), and lead. Basaltic bedrock was encountered throughout the site area at relatively shallow depths (0.0 to 5.5 ft below ground surface (bgs)). DRO, including kerosene, exceeded the Method Two cleanup level of 250 milligrams per kilogram (mg/kg) at five of the test pit sites (Figure 3). Sample concentrations exceeding the Alaska Department of Environmental Conservation (ADEC) Method Two cleanup levels varied from 940 mg/kg to 15,000 mg/kg.

Samples taken at the Former DSS did not reveal any GRO or BTEX (benzene, toluene, ethylbenzene or total xylenes). RRO detected in a single sample was only 66 mg/kg and below the ADEC Method Two 10,000 mg/kg level of concern. Lead was detected in five of five samples analyzed, but the maximum value reached only 11 mg/kg, well below the ADEC level of concern at 400 mg/kg.

Hart Crowser estimated a range of PCS exceeding the ADEC Category C [regulatory level of concern in effect at the time for DRO was 1,000 mg/kg] from 910 to 1,950 cubic yards (yd^3). However, Hart Crowser also estimated a figure of 1,300 yd^3 of PSC exceeding 1,000 mg/kg, including the PCS on the inaccessible eastern slope.

Columbia Environmental Sciences, Inc. (CESI) installed a groundwater monitoring well (MWA-1) near Hart Crowser's TP- 9 (Figures 3 and 4). A thick clay sequence was logged in MWA-1 at the water table similar to one encountered at MW46-22. CESI analyzed drill cuttings and found DRO at concentrations of 2,500 mg/kg at 6-7 ft bgs and 4,800 mg/kg at 38-40 ft bgs (CESI 2000). A single soil boring at the site (ASTSB-2) located near Hart Crower's test pit 16, contained DRO at a concentration of 13,000 mg/kg, similar to Hart Crower's finding of 15,000 mg/kg. Petroleum products were detected in groundwater monitoring wells near the fuel pipeline.

NOAA contractors conducted quarterly groundwater monitoring from September 2000 to September 2001 and from October 2003 to July 2004 in the vicinity of the Former DSS. During the sampling events, DRO were detected above their ADEC Table C cleanup level of 1,500 micrograms per liter (µg/L) in well MWA-1, with a maximum detected concentration of 4,000 µg/L (Figure 4). No other contaminants were encountered in MWA-1 above their ADEC Table C cleanup levels. Groundwater in the vicinity of the site is thought to flow radially away from the site and eventually toward the Bering Sea or St. Paul Harbor (Figure 6), according to Mitretek Systems (Mitretek 2002). The depth to groundwater at MWA-1 is approximately 80 ft bgs.

Monitoring well MWA-2, located downgradient and easterly of MWA-1, as well as downgradient of the AST Saddle Complex Site, did not reveal DRO contamination above Table C levels of concern (Figure 4). However monitoring wells MW46-5, MW46-6 and MW46-7, located downgradient and north or northeasterly of MWA-1, revealed contaminants above ADEC Table C levels of concern. At MW46-5, DRO were found at a maximum concentration of 7,200 µg/L and benzene was found at a maximum concentration of 10 µg/L (Figure 4); no other contaminants were found at MW46-5 above their ADEC Table C cleanup levels. The ADEC Table C cleanup level for benzene is 5 µg/L. At MW46-6, DRO were found at a maximum concentration of 11,000 µg/L, GRO were found at a maximum concentration of 4,500 µg/L, and benzene was found at a maximum concentration of 530 µg/L (Figure 4); no other contaminants were found at MW46-6 above their ADEC Table C cleanup levels. The ADEC Table C cleanup level for GRO is 1,300 µg/L. At MW46-7, DRO were found at a maximum concentration of 5,500 µg/L; no other contaminants were found at MW46-7 above their ADEC Table C cleanup levels (Figure 4). One should note that these three wells, while downgradient of the Former DSS (Figure 6), are also within or potentially downgradient of other potential source areas including the active St. Paul Delta Western above ground fuel storage tank farm, TPA Site 10 (Former Gasoline Tank Farm), TPA Site 9e (Municipal Garage/Machine Shop), TPA Site 9f (Cascade Building), TPA Site 9g (Former Fouke Bunkhouse), and TPA 9b (Former Power Plant).

Mitretek Systems (2002) evaluated the 2000-2001 groundwater data for the St. Paul Village area, which includes the Former DSS. The Mitretek report demonstrated that groundwater in the vicinity of St. Paul Village has high total dissolved solids and can be brackish. Consequently, the groundwater in the area is not suitable for drinking water. The evaluation, in part, provided a rationale for using alternative groundwater cleanup levels that are protective of human health and the environment where the groundwater is not potable. Mitretek concluded in accordance with 18 AAC 75.350 (ADEC 2003) that groundwater in the Village area is not currently used and does not afford any potential future use as a drinking water source.

These findings provided the basis for the application of the Ten Times Rule discussed below.

Summary of Applied Cleanup Levels:

NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2003). Alternative cleanup levels were also applied for some compounds. For benzene, under the TPA, NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). Additionally, NOAA proposed and ADEC approved the use of alternative cleanup levels under 18 AAC 75.345 and 18 AAC 75.350,

commonly referred to as the Ten Times Rule (ADEC 2002, Mitretek Systems 2002). According to these regulations, if groundwater beneath a site contains contaminant concentrations above the cleanup levels provided in ADEC Table C, then the soil may be remediated to levels ten times higher than those provided in Method Two Tables B1 and B2 for the migration to groundwater pathway for those contaminants found in groundwater at concentrations above the cleanup levels provided in ADEC Table C; however, if the inhalation or ingestion pathway values are more stringent than the migration to groundwater pathway, then the more stringent value is to be applied. ADEC uses 15 feet below ground surface (bgs) to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2003; 18 AAC 75.340 (j)(2)). Therefore NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 feet to address the inhalation and ingestion pathways. Cleanup criteria were applied to the maximum extent practicable (18 AAC 75.325 (f), 18 AAC 75.990).

Summary of Cleanup Actions:

Corrective action activities for the Former DSS were initiated on July 7, 2003 and completed on July 18, 2003 (NOAA 2003, Tetra Tech 2004a). The initial area of excavation was selected based on suspected contamination identified during previous investigations, while the extent of excavation was determined based upon thin-layer chromatography (TLC) screening sample analyses, as well as visual and olfactory observations. Excavation of contaminated soil was conducted to the maximum extent practicable. If contaminant concentrations remained above ADEC Method Two cleanup levels based on TLC screening sample analyses, additional excavation was conducted even if the concentrations were below alternative cleanup levels unless further excavation was prevented by the presence of obstructions. The excavated PCS was temporarily stockpiled atop a liner at the Blubber Dump, then was relocated and stockpiled at the ADEC-approved short-term stockpile at NOAA's Tract 42 landfill site in October 2003. The PCS will undergo final disposal at the National Weather Service land spreading site, or other ADEC approved disposal alternative.

Before and during excavation activities, miscellaneous large tires were placed near the top of the slope along the eastern edge of the site to prevent boulders from rolling downhill from the excavation. Excavation activities were initiated at the Former DSS in the area south of monitoring well MWA-1, and progressed to the north, east, and west based on TLC screening sample analyses, as well as, visual and olfactory observations (Figure 7). Signs of contamination, including petroleum staining and odors, were noted throughout the excavation including beneath the suspected location of the former transfer tank and pipelines. Depth of excavation ranged from approximately 2 feet bgs along the east side to approximately 6 feet bgs on the west side and was limited because of refusal caused by the presence of large boulders; when necessary, personnel used hand tools to shovel heavily contaminated material into the excavator bucket. The excavation was expanded laterally in all directions until TLC screening sample analyses indicated that concentrations of contaminants were below ADEC Method Two cleanup levels. The excavation could not be expanded further to the east due to safety concerns regarding the steep slopes of Village Hill (Figure 7). Excavation in the north portion of the site was limited by the presence of large boulders as well as the need to maintain a safe distance from the gazebo atop Village Hill (Figures 7 and 8). In addition, the former fuel transfer pipeline, once used as a conduit to supply electricity to the gazebo atop Village Hill, was removed and contaminated soil beneath it was excavated in areas accessible to the excavator. A small lava tube was also identified during excavation activities. Twelve confirmation samples and 2 field duplicate samples were collected from the bottom of the excavation for laboratory analyses including BTEX, GRO, DRO, RRO, select polynuclear aromatic hydrocarbons (PAHs), and lead (Figure 8). Table 1 provides a summary of the non-PAHs confirmation sample data. PAHs are not presented in Table 1 as no samples contained PAHs above their ADEC Method Two cleanup levels. Numeric PAHs results can be found in the corrective action report for this site (Tetra Tech 2004a). Stockpile samples were not collected during the corrective action. The lack of stockpile samples for this site does not impact data usability (Tetra Tech 2004b).

The excavation was backfilled after TLC screening sample analyses indicated contaminant concentrations were below Method Two cleanup levels, and the collection of fixed laboratory confirmation samples. Backfill operations involved transporting clean fill material from portions of the Telegraph Hill quarry owned by NOAA to the site (Tetra Tech 2004c), dumping the material into the excavation, and compacting the fill material with the exca-

vator bucket or by track-walking the excavator over the area. The area of excavation was restored to its original grade. Backfilling and site restoration activities were completed on July 18, 2003.

During this corrective action, a total of approximately 1,160 yd^3 of PCS were removed from the excavation at the Former DSS.

Confirmation samples collected from the bottom of the excavation at the Former DSS indicated DRO concentrations varying from 200 mg/kg to 19,000 mg/kg. Ten of the twelve samples collected from this area contained concentrations of DRO above the ADEC Method Two cleanup level of 250 mg/kg, and seven of the twelve samples were above the alternative cleanup level of 2,500 mg/kg for DRO (Figure 8). The samples exceeding the alternative cleanup level for DRO were collected at refusal (*i.e.*, excavation equipment could not remove additional contaminated material). Although no further excavation could be conducted in this area because of equipment limitations (*i.e.*, excavator reach from accessible areas), as discussed above, the excavation depth of 2 to 6 ft bgs is sufficient to mitigate inhalation and ingestion pathways given the site land use as recreational and the use of 2 to 6 ft of clean backfill material over the contamination.

Concentrations of all other contaminants were below the ADEC Method Two cleanup levels.

Laboratory reporting limits were below ADEC Method Two cleanup levels for all contaminants except benzene. For benzene, reporting limits of 0.1 mg/kg or lower were achieved, which is above the ADEC Method Two cleanup level of 0.02 mg/kg, but below the alternative cleanup level of 0.5 mg/kg. Concentrations of all other contaminants in confirmation samples collected were below the ADEC Method Two cleanup levels.

Recommended Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action at the Former Gasoline/Diesel Fuel Drum Storage Site, TPA Site 9o/NOAA Site 50 in accordance with the Agreement and that ADEC requires no further remedial action plan from NOAA.

References:
Alaska Department of Environmental Conservation (ADEC). 1991. Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Contaminated Sites Program. July 17, 1991.

ADEC. 2002. Letter from Louis Howard, Project Manager, Alaska Department of Environmental Conservation, to John Lindsay, Project Manager, NOAA Pribilof Project Office regarding ADEC conditional approval for applying the Ten Times Rule. May 30.

ADEC. 2003. Title 18 of the Alaska Administrative Code 75, Articles 3 and 9. Oil and Hazardous Substances Pollution Control Regulations. State of Alaska. January 30.

Columbia Environmental Sciences, Inc. 2001. *Draft Site Characterization Report, Tract 46 and Vicinity (TPA Site 9), St. Paul Island, Alaska*. Version 2.1. CESI. Kennewick, WA. December 16.

Hart Crowser, Inc. 1997. *Expanded Site Inspection of St. Paul Island, Pribilof Islands, Alaska*. January.

IT Alaska Corporation. 2002. *Draft Annual Groundwater Monitoring Report 2001, St. Paul Island, Alaska*. March.

Mitretek. 2002. *Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska*. Prepared by Mitretek Systems, for the National Oceanic and Atmospheric Administration. June 5.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*. Attorney General's Office File No. 66 1-95-0126, National Oceanic and Atmospheric Administration. January 26.

NOAA. 2003. Draft Corrective Action Plan for Petroleum Contaminated Soil Removal at the Former Gasoline/Diesel Drum Storage Site (Site 9o), St. Paul Island, Alaska. June 3.

Tetra Tech EM Inc. (Tetra Tech). 2004a. *Final Corrective Action Report, Site 50/TPA Site 9o-Former Gasoline/Diesel Drum Storage Area, St. Paul Island, Alaska*. August 27.

Tetra Tech. 2004b. *Letter Report, Summary of 2003 Field Season Stockpile Activities, St. Paul Island, Alaska*. July 23.

Tetra Tech. 2004c. *Letter Report, Summary of 2003 Field Season Backfill Activities, St. Paul Island, Alaska*. July 23.

U.S. Department of the Interior. 1959. *Plan, St. Paul Island, Diesel Fuel and Gasoline Storage and Distribution System*. Sheet 10 of 15, signed by D.D. Powell (1959), approved by C.R. Lucas (1961).

Woodward-Clyde Consultants, Inc. 1994. *Site Inspection Report, St. Paul Island, Alaska. Contract No. DACA67-92-D-1017. Delivery Order No. 36*. November.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

9/30/04
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at the Former Gasoline/Diesel Drum Storage Site, TPA Site 9o/NOAA Site 50, in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

10/1/04
Date

Tables and Figures

Table 1. Analytical Data Summary for Confirmation Samples from the Former Gasoline/Diesel Drum Storage Site, TPA Site 9o/Site 50, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
Site 50/TPA Site 9o Confirmation Samples									
SP50-CS-919-050	5	0.05 U	0.05 U	0.05 U	0.05 U	3 U	**13,000**	990	2.80
SP50-CS-920-030	3	0.06 U	0.06 U	0.06 U	0.06 U	4 U	**11,000**	860	7.22
SP50-CS-921-020	2	0.06 U	0.06 U	0.06 U	0.06 U	4 U	**10,000**	710	8.69
SP50-CS-922-020	2	0.03 U	0.03 U	0.03 U	0.03 U	2 U	**1,800**	470	17.50
SP50-CS-923-040	4	0.03 U	0.03 U	0.03 U	0.03 U	2 U	**710**	94	1.63
SP50-CS-924-030	3	0.02 U	0.02 U	0.02 U	0.03	3	**3,700**	270 J	7.97
SP50-CS-925-030[a]	3	0.02 U	0.02 U	0.02 U	0.03	2	**2,100**	140	3.22
SP50-CS-926-050	5	0.03 U	0.03 U	0.03 U	0.03 U	2 U	**1,900**	320	2.27
SP50-CS-927-040	4	0.03 U	0.03 U	0.03 U	0.03 U	2 U	200	50 U	3.37
SP50-CS-928-050	5	0.03 U	0.03 U	0.03 U	0.03 U	2 U	**310**	50 U	2.48
SP50-CS-929-040	4	0.03 U	0.03 U	0.03 U	0.03 U	2 U	**3,400**	230	3.35
SP50-CS-930-040	4	0.07 U	0.07 U	0.07 U	0.07 U	4 U	**19,000**	1,100	3.10
SP50-CS-931-060	6	0.10 U	0.10 U	0.10 U	0.10 U	5 U	**13,000**	500 U	3.74
SP50-CS-932-060[b]	6	0.09 U	0.09 U	0.09 U	0.09 U	5 U	**14,000**	500 U	4.77
Trip Blank Sample									
Trip blank	--	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
ADEC Method Two Cleanup Level[c]		0.02	5.4	5.5	78	300	250	10,000	400[g]
Alternative Cleanup Level[d]		*0.5*[e]	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*

Notes:

bold Indicates concentration above cleanup levels. Although reporting limits for benzene sometimes exceeded the ADEC Method Two cleanup level of 0.02 mg/kg, reporting limits did not exceed the alternative cleanup level of 0.5 mg/kg.

ADEC Alaska Department of Environmental Conservation

bgs Below ground surface

BTEX Benzene, toluene, ethylbenzene, and total xylenes

DRO Diesel-range organic compounds

GRO Gasoline-range organic compounds

J Analyte was positively identified, but concentration is estimated; result is considered qualitatively acceptble, but quantitatively unreliable.

mg/kg Milligram per kilogram

-- Not analyzed

NA Not available

PAH Polynuclear aromatic hydrocarbon

RRO Residual-range organic compounds

TPA Two-Party Agreement

U The analyte was analyzed for, but was not detected above the sample reporting limit.

a Duplicate of Sample No. SP50-CS-924-030

b Duplicate of Sample No. SP50-CS-931-060

c Cleanup level is from Title 18 of the *Alaska Administrative Code* 75 "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000. Contaminants of concern for this site are limited to

d Cleanup level obtained from ADEC Method Two based on the 1991 cleanup level, as referenced in Section 5.0 of the corrective action plan (National Oceanic and Atmospheric Administration [NOAA] 2003a).

e Under the TPA, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg).

f Cleanup level selected is based on more stringent value associated with ingestion and inhalation pathways.

g Although this site is located in an industrial area, NOAA is using the residential cleanup level for lead (400 mg/kg).

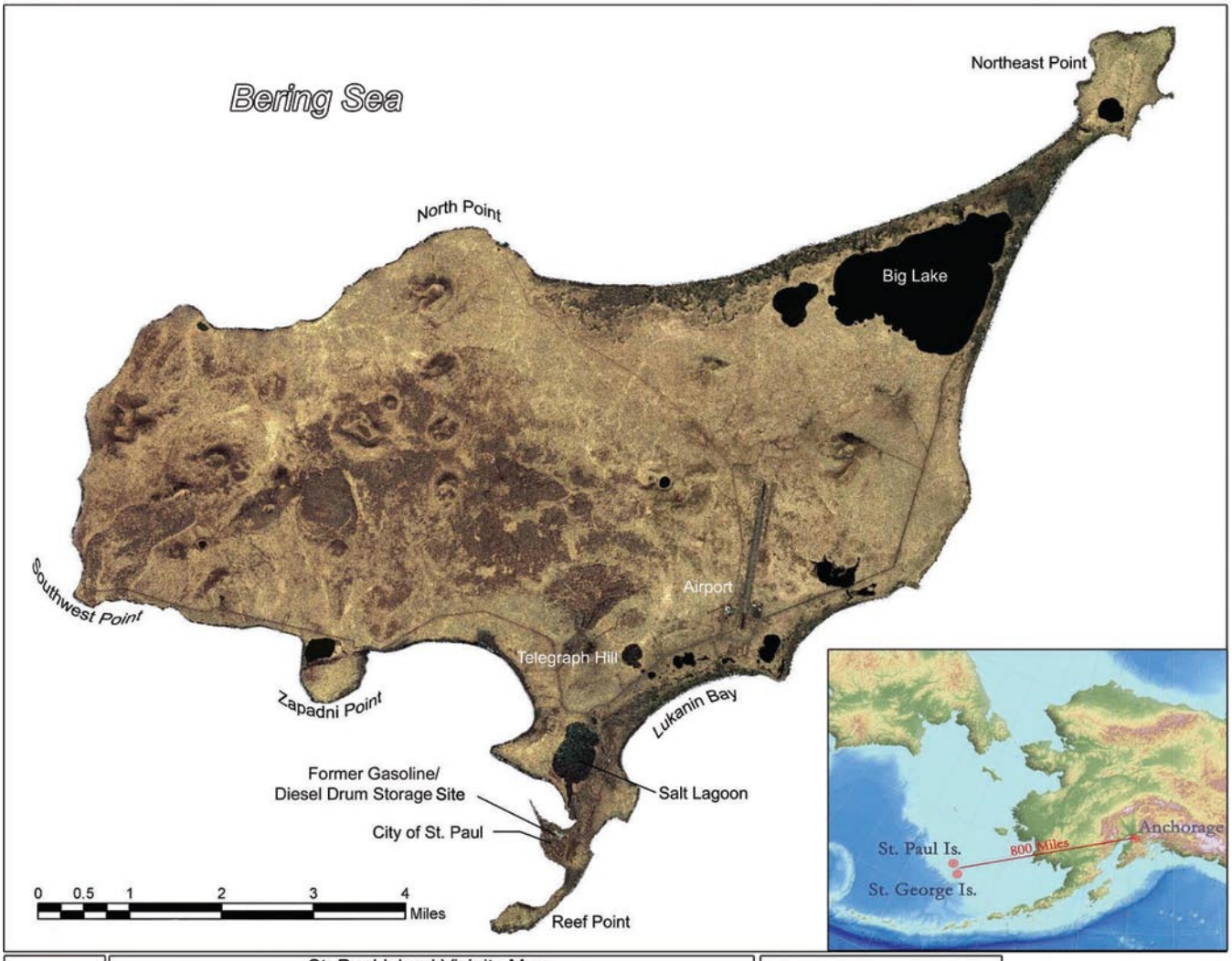


Figure 1	St. Paul Island Vicinity Map Former Gasoline/Diesel Drum Storage Site NOAA Site 50/TPA Site 9o St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001	Pribilof Islands Restoration Project

Figure 2	Legal Property Description Map Former Fuel Drum Storage Site NOAA Site 50/TPA Site 9o St. Paul Island, Alaska	Sources: BLM Tracts (BLM MTPs 1983), TPA 9o Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

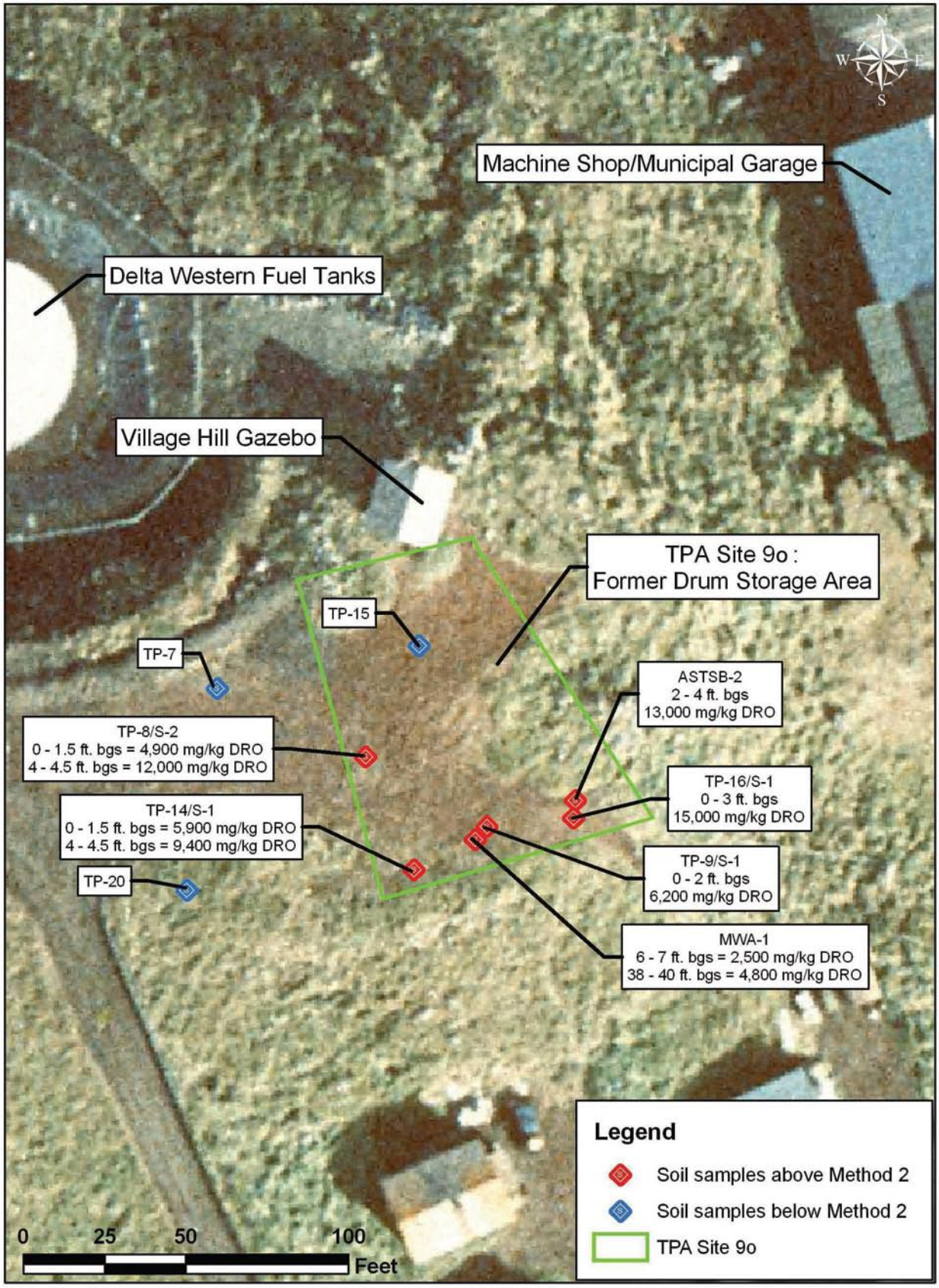


Figure 3	Historical Sampling Locations Former Fuel Drum Storage Site NOAA Site 50/TPA Site 9o St. Paul Island, Alaska	Sources: Aerial Photo (Aeromap, 1996), Sample Locations (Pribilof Project Sample Database), Building and TPA Locations (Pribilof Project GIS Database).

Pribilof Islands Restoration Project

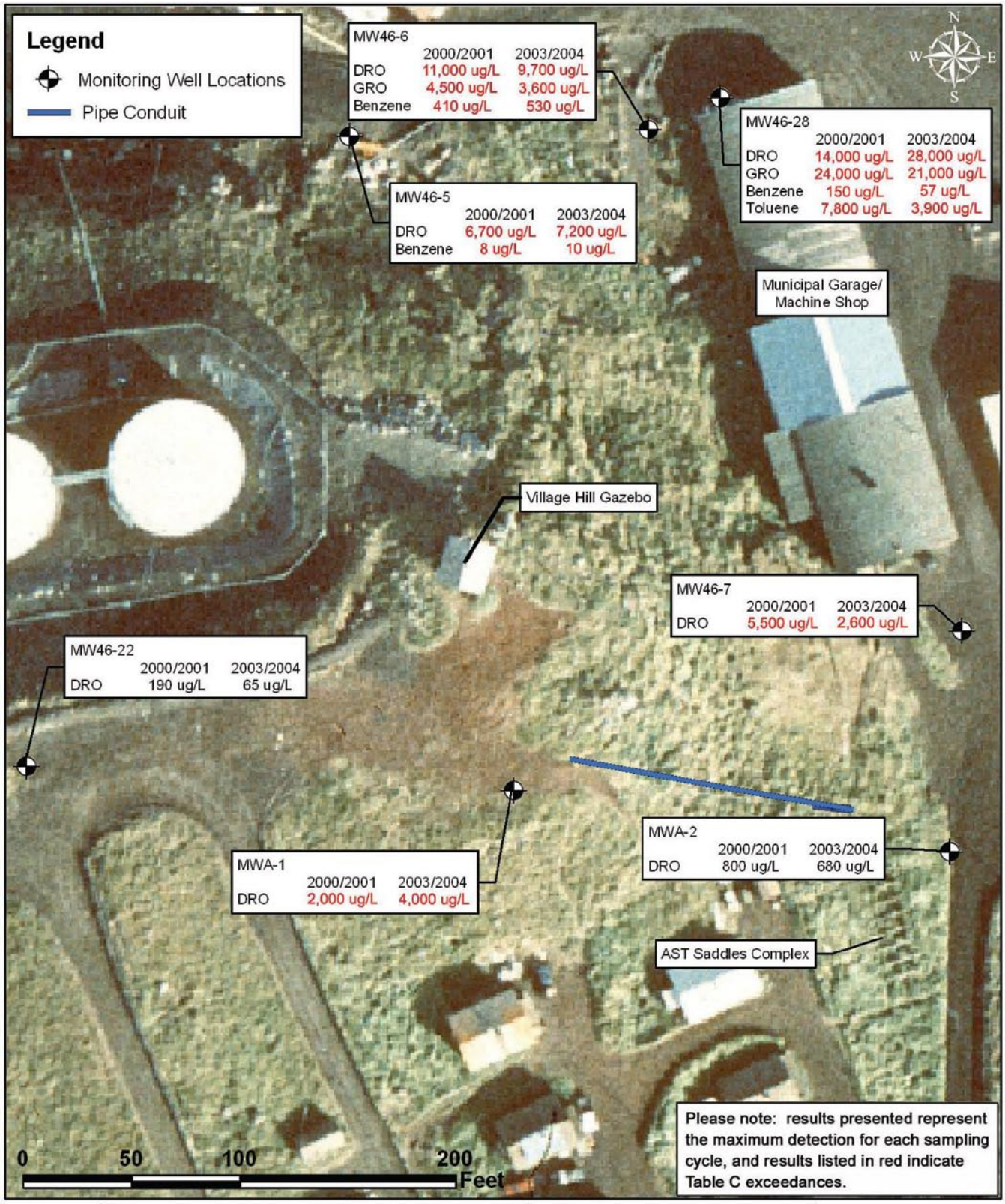
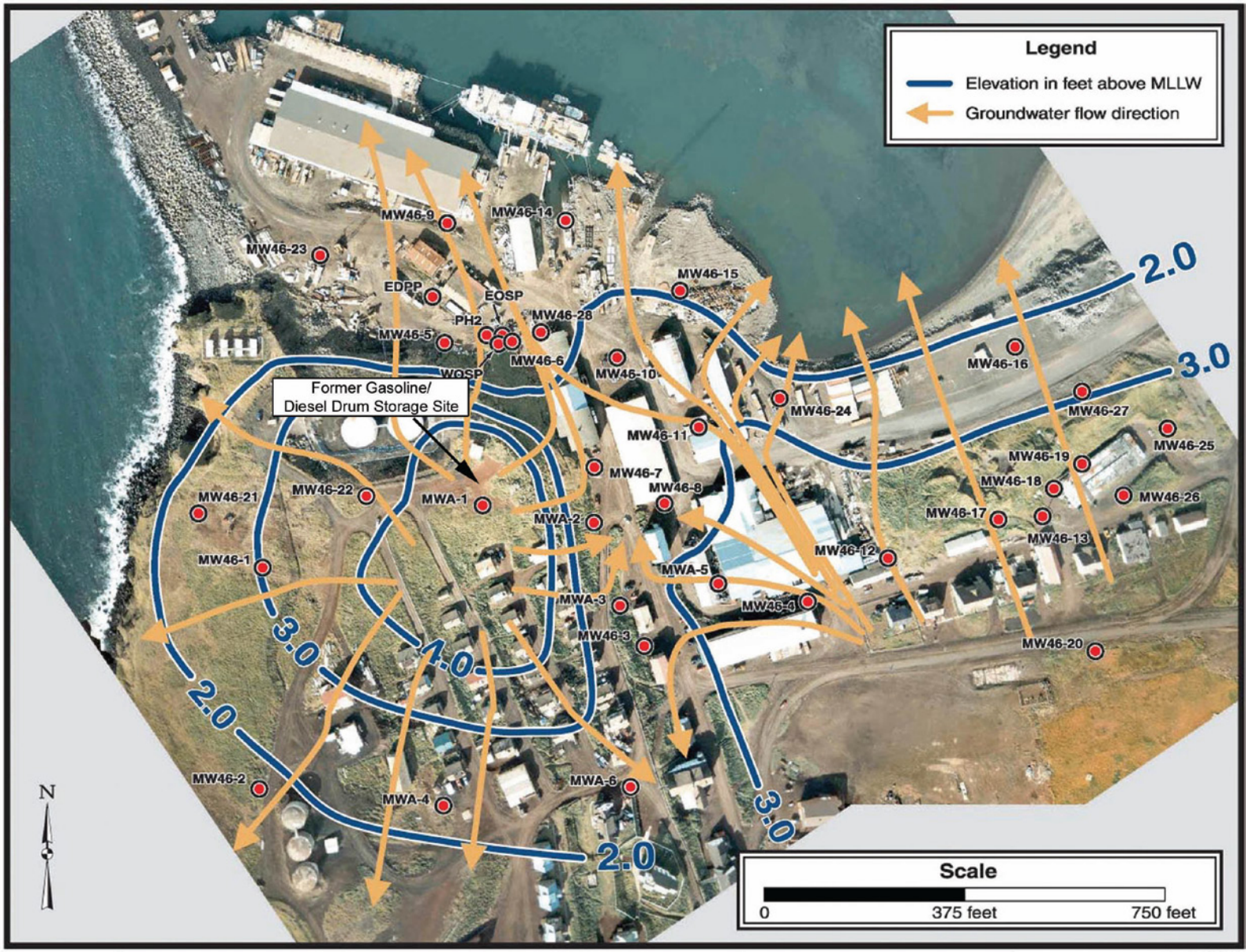


Figure 4	Groundwater Sampling Results Former Gasoline/Diesel Drum Storage Site NOAA Site 50/TPA Site 9o St. Paul Island, Alaska	Sources: Excavation Extent (NOAA GPS 2003), Monitoring Wells (Pribilof Project GIS Database), Aerial Photo (Aeromap US 1996).	Pribilof Islands Restoration Project

Figure 5	View of AST Saddles Complex Site and Former Gasoline/Diesel Drum Storage Site from the north side of the Fur Seal Plant, circa 1950s. NOAA Site 50/TPA Site 9o St. Paul Island, Alaska	Source: Historical Photo (NOAA).

Pribilof Islands Restoration Project



From CESI 2001b

Figure 6	Mean Groundwater Level Contours and Flow Direction Former Gasoline/Diesel Drum Storage Site NOAA Site 50/TPA Site 9o St. Paul Island, Alaska	Source: Mitretek, 2002.	Pribilof Islands Restoration Project

Figure 7	Area of Excavation Former Gasoline/Diesel Drum Storage Site NOAA Site 50/TPA Site 9o St. Paul Island, Alaska	Sources: Excavation Extent (NOAA GPS 2003), Monitoring Wells (Pribilof Project GIS Database), 1-Meter Contour Intervals (USGS DEM 2001) Aerial Photo (Aeromap US 1996).	Pribilof Islands Restoration Project

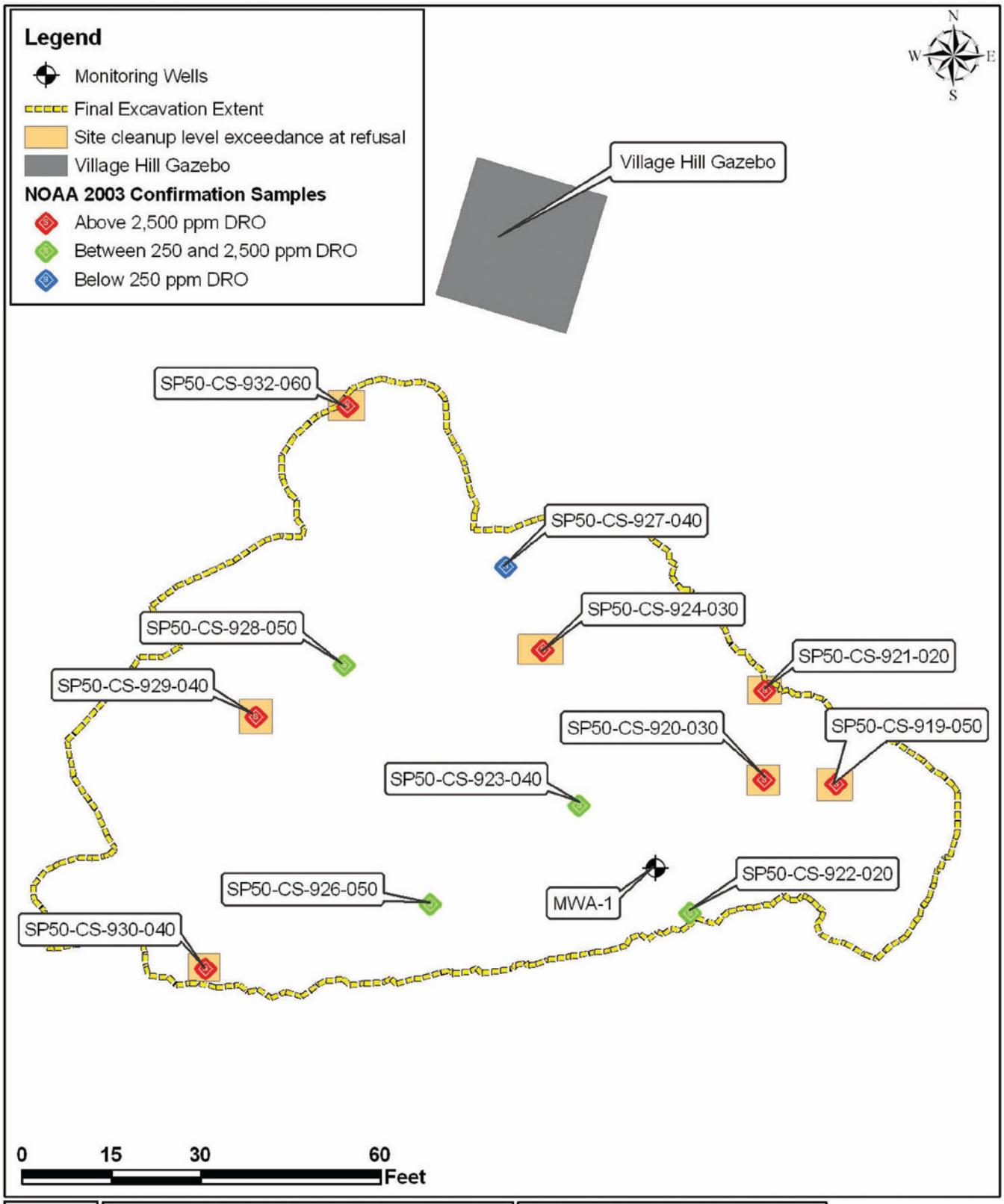


Figure 8	Sampling Location Map Former Gasoline/Diesel Drum Storage Area Site 50/TPA Site 9o St. Paul Island, Alaska	Sources: Excavation Extent and Confirmation Sample Locations (NOAA GPS 2003), Monitoring Wells and Building Footprint (Pribilof Project GIS Database).	Pribilof Islands Restoration Project

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

FRANK H. MURKOWSKI, GOVERNOR
555 Cordova Street
Anchorage, AK 99501
PHONE: (907) 269-7552
FAX: (907) 269-7649
http://www.state.ak.us/dec/home.htm

File No.: 2644.38.023.15

October 11, 2004

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-0070

RE: Request for No Further Remedial Action Planned Determination Former Gasoline/Diesel Fuel Drum Storage Site, TPA 9o Site 50, St. Paul Island October 2004

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (the Department) received the above document on October 8, 2004, for review and comment. Based on our review of the document and the data provided, the Department finds the petroleum contaminated soil has been removed to the maximum extent practicable by NOAA. One-thousand and one-hundred sixty (1,160) cubic yards of soil has already been excavated by NOAA. The Department has determined that a no further remedial action planned (NFRAP) determination is appropriate for TPA 9o.

The site is located in Tract 3, Township 35 South, Range 132 West of the Seward Meridian, Alaska, as shown on the plat of rectangular survey officially filed May 14, 1986 (57° 07' 22.18" North latitude, 170° 16' 56.4" West longitude). The Department's NFRAP determination is equivalent to certification by the Department that corrective action is complete under TPA section 59. Closure of Sites of Operable Units which states: "... NOAA may request from ADEC written confirmation that all corrective action has been completed at a site(s) or operable unit(s) in accordance with this Agreement. Within thirty (30) Days of its receipt of such request. ADEC shall: (1) provide written confirmation that no further corrective action is required at the subject site(s) or operable unit(s)."

In the event that the remaining contaminated soil becomes accessible by the removal of the soil located in the vicinity of the Former Gasoline/Diesel Fuel Drum Storage Site TPA 9o Site 50, the land owner and/or operator will be required under 18 AAC 75.300 to notify the Department. Also, any transport or disposal of contaminated soil excavated from the site outside of the "Village Area" requires approval from the Department in accordance with 18 AAC 75.325(i).

The Department reserves all of its rights, under A.S. 46.03, 18 AAC 75, and 18 AAC 78 to require NOAA to conduct additional site assessment, remediation, and/or other necessary actions deemed appropriate by the Department at TPA 9o if information becomes available that contamination is present which poses an unacceptable risk to human health or safety, welfare, or the environment.

Please contact me with any questions or concerns directly at (907) 269-7552.

Sincerely,

Louis Howard
Project Manager
Federal Facilities Section

G:\SPAR\SPAR-CS\38 Case Files (Contaminated Sites)\2644 St. Paul Island\2644.38.023.15 TPA 09O Former Gasoline_Diesel Drum Storage\11-Oct-2004 St Paul Former Gasoline_Diesel Fuel Drum Storage Site TPA 9o Site 50 NFRAP Approval.doc

A L A S K A

2008-000214-0

Recording Dist: 305 - Aleutian Islands
5/1/2008 2:26 PM Pages: 1 of 7

NOTICE OF ENVIRONMENTAL CLEANUP AND RESIDUAL SOIL AND GROUNDWATER CONTAMINATION AT TPA09o, GAS/DIESEL DRUM STORAGE, ST. PAUL ISLAND, ALASKA

Pursuant to 18 AAC 75.375, Tanadgusix Corporation, The Aleut Corporation, and the City of St. Paul as the owners, and the U.S. Department of Commerce/National Oceanic and Atmospheric Administration (NOAA), as the operator of the subject property hereby provides public notice that the property located on Village Hill, St. Paul, St. Paul Island, Alaska 99660 is contaminated with petroleum products. More specifically, the site described as follows, Township 35 South, Range 132 West, Tract A, Lot 3, Section 25 and 35 South, Range 132 West, Tract A, undeveloped intersection of Village Street and Church Street, of the Seward Meridian, Alaska (U.S. Survey 4943, Alaska Tract A, St. Paul Townsite accepted August 2, 1968, and located at 57° 7' 21.93" North Latitude; 170°16' 57.02" West Longitude, (Figures 1 and 2) has been subjected to petroleum contaminated soil and groundwater contamination, as a result of a discharge, or release and subsequent cleanup of oil or other hazardous substances, regulated under 18 AAC 75, Article 3 as amended October 2005. If contaminated soil or solid wastes are exposed in the future they must be managed in accordance with laws applicable at that time. These releases and cleanup are documented in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database under site number *CS Reckey* # 1994250135424; 2644.38.023.15.

The Gasoline/Diesel Drum Storage Site was not identified as a site of concern pursuant to the *Pribilof Islands Environmental Restoration Two Party Agreement* (TPA) between the State of Alaska and NOAA (NOAA 1996). Following a site investigation, NOAA subsequently addressed the Gasoline/Diesel Drum Storage Site as TPA Site 9o and NOAA Site 50. Following corrective action, NOAA submitted a request for conditional closure to the ADEC Division of Spill Prevention and Response, Contaminated Sites Program. Following corrective action, NOAA's request stated further cleanup was impracticable because contaminated soils remained buried at the soil horizon where consolidated material (rock) impeded excavation (NOAA 2004). ADEC determined, in accordance with 18 AAC 75.325(f)(1) that site cleanup has been performed to the maximum extent practicable even though residual petroleum contaminated soils, primarily diesel range organics exist on the site property (Tetra Tech 2004). ADEC granted the conditional closure, in part subject to this institutional control (deed notice), and confirmed that no further remedial action was required at the site unless new information becomes available that indicates to ADEC that the site may pose an unacceptable risk to human health, safety, welfare to the environment (NOAA 2004).

Grantor, the US Bureau of Land Management.

Grantees:

- the Tanadgusix Corporation (grantee of the surface estate),
  4300 B Street, Suite 402
  Anchorage, AK 99503-5946

- The Aleut Corporation (grantee of the subsurface estate)
  4000 Old Seward Highway, Suite 300
  Anchorage, AK 99503

Recording District: Aleutian Islands

Remedial Actions and Residual Contamination

The Gasoline/Diesel Drum Storage Site was used by the federal government to store fuel drums from the 1940s to the early 1960s. The drum contents were poured into a gravity feed pipeline leading to an above ground storage tank farm near the base of Village Hill, currently known as the former AST Saddles Site (Township 35 South, Range 132 West, Section 25 Tract A Block 1A of the Seward Meridian, Alaska and is located at 57°21'22" N. Lat.; 170°16'53.09" W. Long.). The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), removed approximately 1,370 cubic yards of petroleum contaminated soils from the site during 2003 (Tetra Tech, 2004). The soil horizon at which consolidated material was found varied from approximately two to six feet below ground surface (Figure 3), Tetra Tech 2004.The site covered a surface area of approximately one acre.

NOAA has several groundwater monitoring wells in the vicinity of the site (Figure 4), which are maintained under its long-term groundwater monitoring plan (NOAA 2005). Groundwater (GW) beneath the site is contaminated with diesel range organic compounds (Tutka 2007). Figure 4 depicts the location of GW wells, groundwater flow direction (Mitretek 2002 and Mitretek 2005), and wells with contamination detected during the most recent sampling in the vicinity of the site (Tutka 2007). The Gasoline/Diesel Drum Storage Site lies within a Critical Water Management Area (CWMA) determined by the Alaska Department of Natural Resources in accordance with 11 Alaska Administrative Code [AAC] 93.500-11 AAC 93.530 (ADNR 2006). The CWMA acts as a management or institutional control necessary before a party can apply alternative cleanup levels to a site (18 AAC 75.345). ADEC acceptance of the CWMA determination by ADNR allowed groundwater cleanup criteria and soil cleanup criteria to increase to ten times the Table C and Method Two (18 AAC 75.341) cleanup levels, respectively, for those compounds listed above (ADEC 2002).

Site Use

In the event that information becomes available which indicates that the site may pose an unacceptable risk to human health, safety, welfare or the environment, the land owner and/or operator is required under 18 AAC 75.300 to notify ADEC and evaluate the environmental status of the contamination in accordance with applicable laws and regulations. Further site characterization and cleanup may be necessary under 18 AAC 75.325-.390 and 18 AAC 78.600. Also, any transport, treatment, or disposal of any potentially contaminated soil or water from the site or use of the groundwater at or near the contaminated area requires notification to and approval from the Department in accordance with 18 AAC 75.370(b) and 18 AAC 78.600(h).

In the future, if contaminated soil or wastes are removed from the site it must be characterized and managed following regulations applicable at that time. Pursuant to 18 AAC 75.325(i)(1) and (2) 18 AAC 75.370, ADEC approval is required prior to moving soil or groundwater that is, or has been, subject to the cleanup rules found at 18 AAC 75.325-.390.

This notice remains in effect until a written determination from ADEC is recorded that states that soil and/or groundwater at the site has been shown to meet the most stringent soil cleanup levels in Method Two of 18 AAC 75.341(c) and/or groundwater meets the cleanup levels in Table C in 18 AAC 75.345, and that off-site transportation of soil and/or groundwater is not a concern.

References:

Alaska Department of Environmental Conservation (ADEC). 2002. Letter from Jennifer Roberts to John Lindsay NOAA. Re: *Draft Final Groundwater Use and Classification in the Vicinity of Tract 46 TPA 9, April 30, 2002*. May 30.

Alaska Department of Natural Resources (ADNR). 2006. *CWMA Commissioner's Order and Record of Decision, St. Paul Island, Alaska: Title Townsite of the City of St. Paul: Critical Water Management Area Department Order 148.* Includes cover memorandum by Commissioner Michael L. Mange. April 10.

Mitretek Systems. 2002. *Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska*. May.

Mitretek Systems. 2005. *Tidal Corrections for Groundwater Flow in the Critical Water Management Area and the Diesel Seep, St. Paul Island, Pribilof Islands, Alaska*. August 10..

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26.

NOAA. 2004. *Request for No Further Remedial Action Planned for* NOAA Site 50/TPA Site 9o, St. Paul Island, Alaska. Signed and submitted by John Lindsay (NOAA) October 6, 2004. Signed by Louis Howard of ADEC, October 11, 2004. ADEC File No. 2644.38.023.15.

NOAA. 2005. *Final Long Term Groundwater Monitoring Plan, St. Paul Island, Alaska.* Prepared by National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115. August 29.

Tetra Tech. (Tetra Tech EM Inc). 2004. *Final Corrective Action Report Site 50/TPA Site 9o, St. Paul Island, Alaska*. Prepared for National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115. September 8.

Tutka. 2007. *Annual Groundwater Monitoring Report 2007, St. Paul Island, Alaska.* December 21. Prepared for NOAA, Office of Response and Restoration, Seattle, WA. 98115.

Please return original copy of this notice to the (operator) address below:

Signature: _____

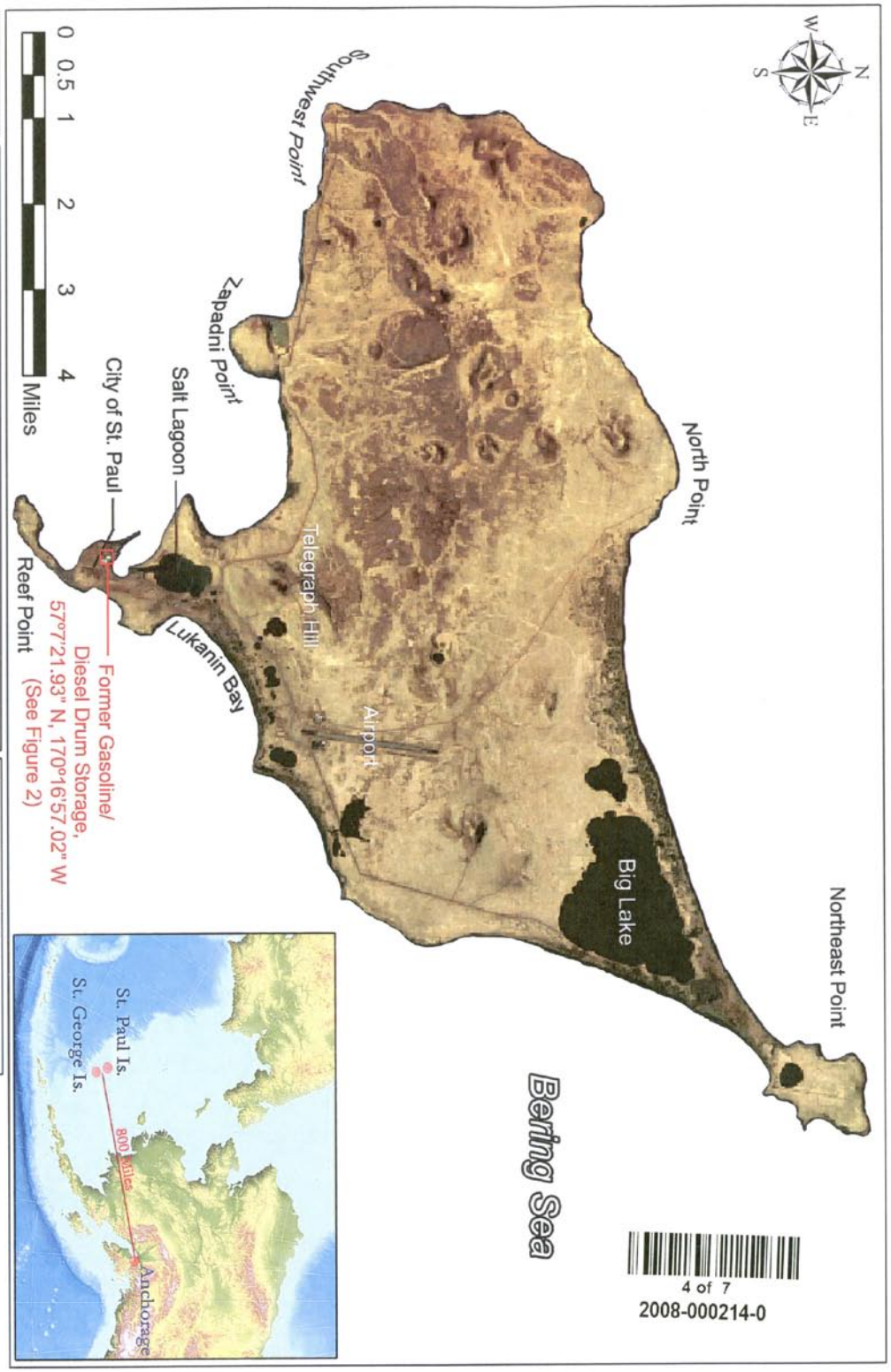
Printed Name: JOHN A LINDSAY

Mailing Address:
Attn: John Lindsay

US DOC, NOAA, NOS, OR&R, PPO
7600 Sand Point Way NE
Bldg 3, RM 1301
Seattle, WA 98115

(seal) Subscribed and sworn to before me this ___ day of _____, 19___.
Notary Public in and for the State of _____
My commission expires:_____

3 of 7
2008-000214-0



4 of 7

2008-000214-0

Figure 1

St. Paul Island Vicinity Map
Former Gasoline/Diesel Drum Storage
NOAA Site 50/TPA Site 9o
St. Paul Island, Alaska

Source: Ikonos Satellite Imagery (Space Imaging 2001)
Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 50, TPA 9o\SNP Standard Fig 1 - Former Gas-Diesel Drum Storage.psd
Date: 4/14/2008

Pribilof Islands Restoration Project

Figure 2	Legal Property Description Map Tract 41, Lot 3, Gov't Lot 3 Former Gasoline/Diesel Drum Storage NOAA Site 50/TPA Site 9o St. Paul Island, Alaska	Source: TPA09o Layers (NOAA Pribilof Project GIS, 2002), Aero-Metric 2006 1 ft Aerial Photo, 1983 Bureau of Land Management Land Survey Plat Officially filed February 15, 1985. Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 50, TPA 9o\GasDrumStrg_PropDescription_Fig2.mxd Date: 4/17/2008 @ 11:50:44 AM

Pribilof Islands Restoration Project

5 of 7
2008-000214-0

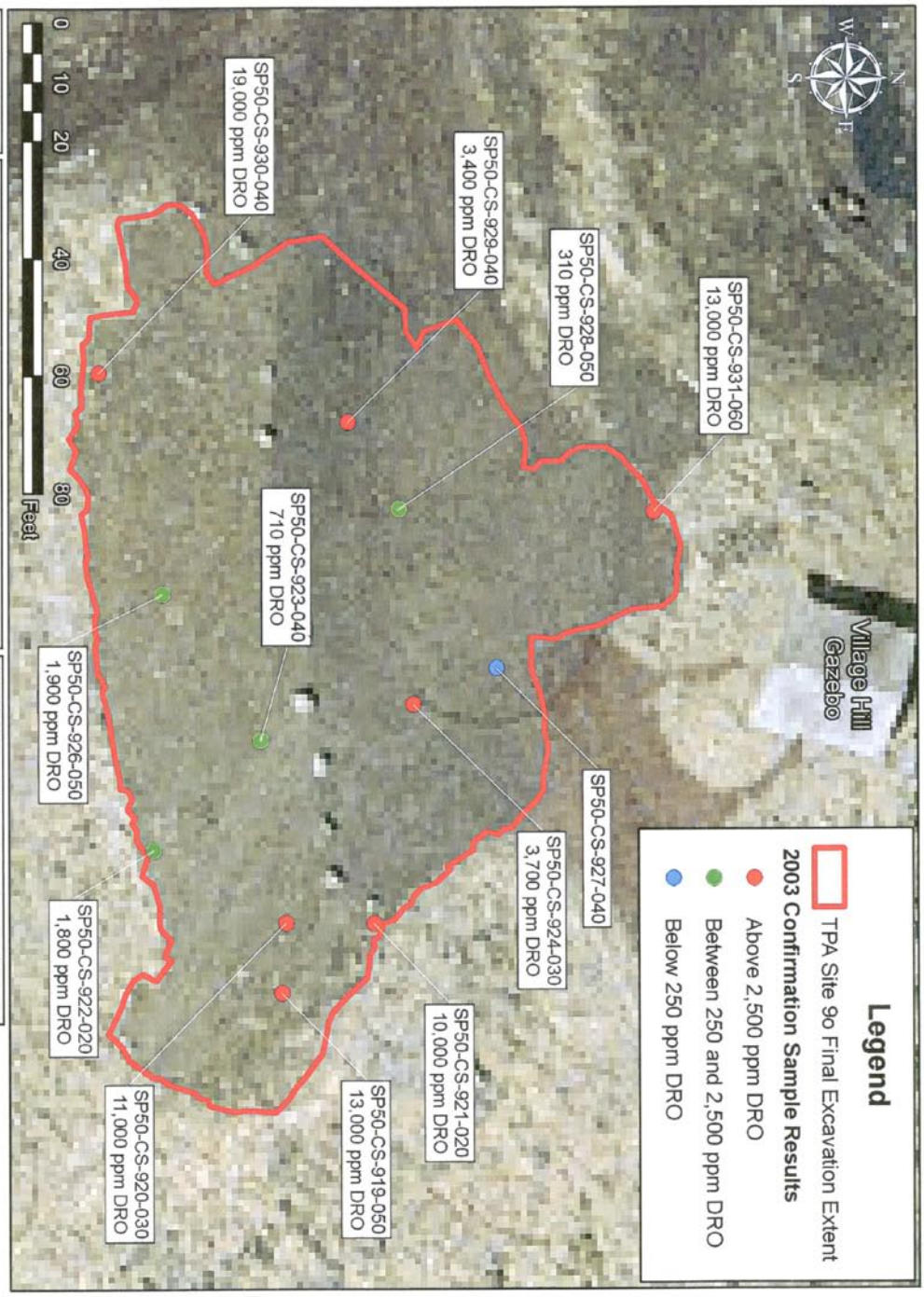


Figure
3

Final Excavation Extent & Confirmation Sampling Results
Former Gasoline/Diesel Drum Storage
NOAA Site 50/TPA Site 9o
St. Paul Island, Alaska

Source: Excavation Extent & Confirmation Samples (NOAA Pribilof Project GIS, 2003) & (2003 Chemical Database),
Aero-Metric 2006 1 ft Aerial Photo
Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 50, TPA 9o\DieselDrum_Sample&Excavation_Fig3.mxd
Date: 4/17/2008 @ 12:07:41 PM

Pribilof Islands Restoration Project

6 of 7
2008-000214-0

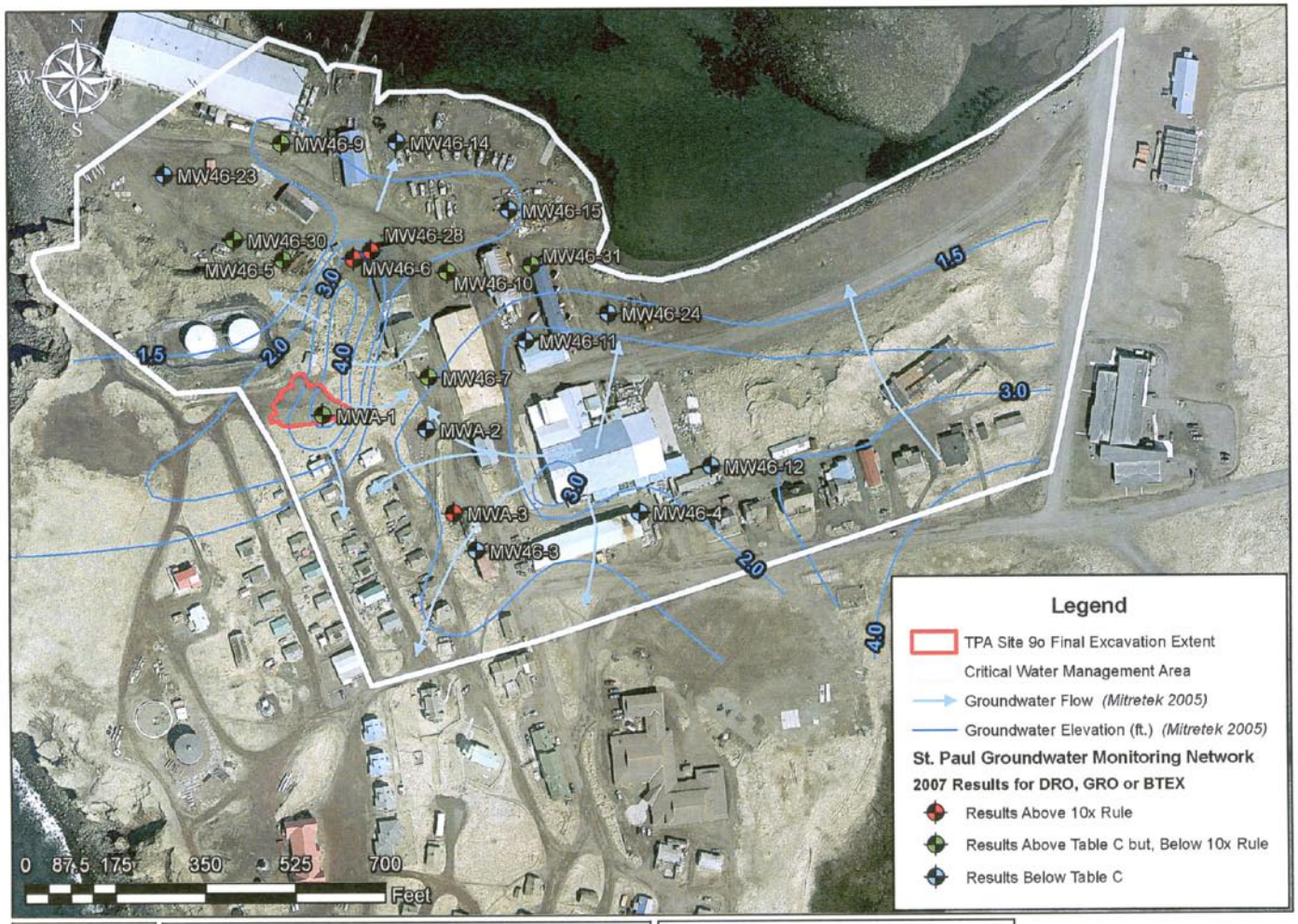


Figure 4	Location of Groundwater Wells & Gradient Former Gasoline/Diesel Drum Storage NOAA Site 50/TPA Site 9o St. Paul Island, Alaska	Source: All Layers (NOAA Pribilof Project GIS 2003-2007), Aero-Metric 2006 1ft Aerial Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 50, TPA 9o\DieselDrum_GW_Wells&Gradient_Fig4.mxd Date: 4/17/2008 @ 11:57:22 AM

Pribilof Islands Restoration Project

7 of 7
2008-000214-0

NOAA Site 51
TPA Site 9p: Fuel Transfer Station and Pipeline (Receiving Warehouse)

Request for NFRAP, West Dock Fuel Transfer Facility,
TPA Site 9p/Site 51, St. Paul Island, Alaska 1239

Request for NFRAP
West Dock Fuel Transfer Facility, TPA Site 9p/Site 51
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site: West Dock Fuel Transfer Facility, also known as Two Party Agreement (TPA) Site 9p and National Oceanic and Atmospheric Administration (NOAA) Site 51

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. On the island, the West Dock Fuel Transfer Facility is situated northeast of the Decommissioned Power Plant Annex and adjacent to the southern edge of the West Dock landing on Village Cove (57°07'27" N latitude, 170°16'56" W longitude; Figure 1).

Legal Property Description: The structures and area of excavation are located in the northern portion of Tract 46, Township 35 South, Range 132 West, of the Seward Meridian, Alaska, as shown on the dependent resurvey of a portion of U.S. Survey No. 4943, Alaska, Tract "A", St. Paul Townsite, officially filed June 3, 1997 (Figure 2).

Type of Release: Potential release mechanisms include: 1) leaks associated with the fuel transfer pipelines; and 2) spills associated with fuel transfer operations.

History and Background:
The West Dock Fuel Transfer Facility consists of a small concrete pump house and associated fuel transfer lines. Based on historical aerial photographs, the concrete pump house was constructed sometime between 1951 and 1959 (U.S. Department of Interior 1951, 1959). During operation, floating fuel transfer lines were reportedly connected from fuel barges in Village Cove to the pump house through West Dock landing. Gasoline and diesel fuel pipelines generally ran south-southwest from the West Dock Fuel Transfer Facility to a valve box near the base of Village Hill. The valve box was used to distribute fuel to other parts of the island. A former fuel tank farm was located on the north side of Village Hill, approximately 200 feet south of the Decommissioned Power Plant Annex; however, it has not been determined whether the West Dock Fuel Transfer Facility was connected to this tank farm.

Summary of Site Investigations:
An expanded site investigation conducted by Hart Crowser, Inc. (Hart Crowser) in 1996 identified the presence of total petroleum hydrocarbons in soil at the West Dock Fuel Transfer Facility (Hart Crowser 1997); however, no contaminants were detected above Alaska Department of Environmental Conservation (ADEC) cleanup levels.

In 1999, Columbia Environmental Services, Inc. (CESI) collected a soil sample at 2 feet below ground surface (bgs) from the north side of the West Dock Fuel Transfer Facility (CESI 2001). Analytical data for this sample revealed the presence of diesel-range organic compounds (DRO) at 1,100 milligrams per kilogram (mg/kg), exceeding the ADEC Method Two cleanup level. Residual-range organic compounds (RRO) were also identified at a concentration of 8,600 mg/kg, below the Method Two cleanup level, at this location.

NOAA contractors conducted quarterly groundwater monitoring from September 2000 to September 2001 and from October 2003 to July 2004 in the vicinity of the West Dock Fuel Transfer Facility. During 2000-2001 sampling events, DRO were detected above their Alaska Department of Environmental Conservation (ADEC) Table C cleanup level of 1,500 µg/l in wells MW46-9 and MW46-14, with maximum detected concentrations of 1,600 µg/l and 2,900 µg/l, respectively (IT Alaska Inc. 2002; Figure 3). During the first three quarters of 2003-2004 sampling, no Table C cleanup level exceedances were detected in wells MW46-9 or MW46-14. High concentrations of DRO and gasoline-range organic compounds (GRO), as well as benzene and toluene, have been detected in wells located up gradient (Mitretek Systems 2002) from the West Dock Fuel Transfer Facility (*e.g.*, 28,000 µg/l DRO and 21,000 µg/l GRO in MW46-28; Figure 3). [Note that NOAA's contractor for the 2001 sampling analyzed for residual-range organic compounds (RRO) by adapting soil analytical method AK103. The adapted method was never approved by ADEC, and no ADEC approved method exists. Thus, although the contractor

reported detecting RRO above its ADEC Table C cleanup level in MW46-14, ADEC has indicated it does not consider this data to be valid, and the results are not included herein.]

Mitretek Systems (2002) evaluated the 2000-2001 groundwater data for the St. Paul Village area, which includes the West Dock Fuel Transfer Facility. The Mitretek report demonstrated that groundwater in the vicinity of St. Paul Village has high total dissolved solids and can be brackish. Consequently, the groundwater in the area is not suitable for drinking water. The evaluation, in part, provided a rationale for using alternative groundwater cleanup levels that are protective of human health and the environment where the groundwater is not potable. Mitretek concluded in accordance with 18 AAC 75.350 (ADEC 2000) that groundwater in the Village area is not currently used and does not afford any potential future use as a drinking water source. These findings provided the basis for the application of the Ten Times Rule discussed below.

Summary of Applied Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2000). Alternative cleanup levels were also applied for some compounds. For benzene, under the TPA, NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). Additionally, NOAA proposed and ADEC approved the use of alternative cleanup levels under 18 AAC 75.345 and 18 AAC 75.350, commonly referred to as the Ten Times Rule (ADEC 2002, Mitretek Systems 2002). According to these regulations, if groundwater beneath a site contains contaminant concentrations above the cleanup levels provided in ADEC Table C, then the soil may be remediated to levels ten times higher than those provided in Method Two Tables B1 and B2 for the migration to groundwater pathway for those contaminants found in groundwater at concentrations above the cleanup levels provided in ADEC Table C; however, if the inhalation or ingestion pathway values are more stringent than the migration to groundwater pathway, then the more stringent value is to be applied. ADEC uses 15 feet below ground surface (bgs) to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2000; 18 Alaska Administrative Code 75.340 (j)(2)). Therefore NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 feet to address the inhalation and ingestion pathways.

Summary of Cleanup Actions:
Corrective action activities for the West Dock Fuel Transfer Facility were initiated in conjunction with corrective action activities at the Decommissioned Power Plant Annex (TPA Site 9d/Site 19) on June 24, 2003 and were largely completed on July 7, 2003 (NOAA 2003, Tetra Tech 2004a). Final completion of the corrective action occurred on October 9, 2003, with the disposal of contaminated soil that had originally been placed into drums during excavation activities due to concerns regarding the potential presence of polychlorinated biphenyls (PCB). Analytical data subsequently documented that PCBs were not present. Initial areas of excavation were selected based on suspected contamination identified during previous investigations, while the extent of excavation was determined based upon thin-layer chromatography (TLC) screening sample analyses or visual and olfactory observations. Excavation of contaminated soil was conducted to the maximum extent practicable. If contaminant concentrations remained above ADEC Method Two cleanup levels based on TLC screening sample analyses, additional excavation was conducted even if the concentrations were below alternative cleanup levels unless further excavation was prevented by the presence of obstructions. The excavated PCS was stockpiled at the Tract 42 landfill site, pending final disposal at the National Weather Service land spreading site, or other ADEC approved disposal alternative.

On June 27, 2003, personnel initiated excavation activities at the West Dock Fuel Transfer Facility. Two areas of contamination were excavated during the corrective action (Figure 4): Area 1 (approximately 17 feet long and 15 feet wide) is located north of the pump house; and Area 2 (approximately 35 feet long and 10 feet wide) is located south of the pump house and generally trends from north to south.

Area 1 was selected to investigate a hot spot identified during a sampling event conducted by CESI in 1999 (CESI 2001). The excavation was advanced vertically to a maximum depth of 4 feet bgs, where refusal was encountered, and laterally until no signs of contamination were identified based on TLC screening sample analyses or visual and olfactory observations.

Area 2 was selected to allow removal of the former diesel fuel and gasoline pipelines from this area. As personnel uncovered the former pipelines, the lines were cut, drained, and staged for disposal. The excavation was not advanced beyond a maximum depth of 4 feet bgs because of refusal and the presence of a live electric line crossing the area diagonally beneath the pipelines. The excavation could not be expanded laterally in any direction as a result of the presence of the pump house to the north, a live electrical line to the east and south, and the access road to the west (Figure 4).

Two confirmation samples were collected from Area 1 and six from Area 2 for laboratory analyses including benzene, toluene, ethylbenzene, and total xylenes (BTEX), DRO, GRO, RRO, select polynuclear aromatic hydrocarbons (PAHs), and lead (Table 1, Figure 5). Confirmation samples collected from the bottom of Area 1 indicated all contaminant concentrations were below their ADEC Method Two cleanup levels. In Area 2, confirmation samples collected from the bottom indicated DRO concentrations that varied from 38 mg/kg to 2,600 mg/kg; three of the six samples collected from this area exceeded the ADEC Method Two cleanup level of 250 mg/kg, and one of the six samples exceeded the alternative cleanup level of 2,500 mg/kg. The sample exceeding the alternative cleanup level for DRO (SP51-CS-002-040) was collected from the bottom of the excavation, which could not be further excavated due to the reasons discussed above. Benzene concentrations in confirmation samples collected from the bottom of Area 2 varied from not detected to 0.15 mg/kg; five of the eight samples collected from this area exceeded the ADEC Method Two cleanup level of 0.02 mg/kg, but none of the samples exceeded the alternative cleanup level of 0.5 mg/kg. Concentrations of all other contaminants in confirmation samples collected from Area 2 were below the ADEC Method Two cleanup levels.

Laboratory reporting limits were below ADEC Method Two cleanup levels for all analyses except benzene. For benzene, reporting limits varied from 0.02 mg/kg to 0.04 mg/kg, which is above the ADEC Method Two cleanup level of 0.02 mg/kg, but below the alternative cleanup level of 0.5 mg/kg.

Each excavation was backfilled after TLC screening sample analyses indicated contaminant concentrations below ADEC Method Two cleanup levels and fixed laboratory confirmation samples had been collected. If remaining contamination was suspected but further excavation was prevented by the presence of obstructions such as structures, rock, boulders, and utility lines, backfill was also placed after fixed laboratory confirmation samples had been collected. Backfill operations involved transporting clean fill material from the portion of the Telegraph Hill quarry owned by Tanadgusix Corporation (TDX) to the site (Tetra Tech 2004b), dumping the material into the excavation, and compacting the fill material with the excavator bucket or by track-walking the excavator over the area. Each area of excavation was restored to its original grade. Backfilling and site restoration activities were completed on July 7, 2003.

During the corrective action, a total of approximately 250 cubic yards of soil were removed from the excavations at the West Dock Fuel Transfer Facility. Stockpile samples collected from the removed PCS contained concentrations of DRO that varied from 7,000 mg/kg to 26,000 mg/kg and RRO that varied from 2,100 mg/kg to 6,700 mg/kg (Tetra Tech 2004c). Pipelines removed from the excavations were cut into manageable sections and staged for future off-island disposal. In addition, the pump house building was cleaned, and all trash and debris were removed from the interior. Pipes and bolts within the building were cut flush with the surface of the concrete, and access ways were sealed with plywood.

Recommended Action:

In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action at the West Dock Fuel Transfer Facility, TPA Site 9p/ Site 51 in accordance with the Agreement and that ADEC requires no further remedial action plan from NOAA.

References:

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Contaminated Sites Program*. July 17, 1991.

ADEC. 2000. Title 18 of the Alaska Administrative Code 75, Articles 3 and 9. *Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. Amended through October 28, 2000.

ADEC. 2002. Letter from Louis Howard, Project Manager, Alaska Department of Environmental Conservation, to John Lindsay, Project Manager, NOAA Pribilof Project Office regarding ADEC conditional approval for applying the Ten Times Rule. May 30.

Columbia Environmental Sciences, Inc. 2001. Draft Site Characterization Report, Tract 46 and Vicinity (TPA Site 9), St. Paul Island, Alaska. Version 2.1. CESI. Kennewick, WA. December 16.

Hart Crowser, Inc. 1997. Expanded Site Inspection of St. Paul Island, Pribilof Islands, Alaska. January.

IT Alaska Corporation. 2002. Draft Annual Groundwater Monitoring Report 2001, St. Paul Island, Alaska. March.

Mitretek Systems. 2002. Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska. Prepared by Mitretek Systems, for the National Oceanic and Atmospheric Administration. June 5.

National Oceanic and Atmospheric Administration (NOAA). 1996. Pribilof Islands Environmental Restoration Two Party Agreement. Attorney General's Office File No. 66 1-95-0126, National Oceanic and Atmospheric Administration. January 26.

NOAA. 2003. Final Draft Corrective Action Plan for the Removal of the West Dock Fuel Transfer Facility (Site 9P) and the Decommissioned Power Plant Annex (Site 9D), St. Paul Island, Alaska. May 21.

Tetra Tech EM Inc. (Tetra Tech). 2004a. Final Corrective Action Report, Site 19/TPA Site 9d-Decommissioned Power Plant Annex, Site 51/TPA Site 9p-West Dock Fuel Transfer Facility, St. Paul Island, Alaska.

Tetra Tech. 2004b. Letter Report, Summary of 2003 Field Season Backfill Activities, St. Paul Island, Alaska. July 23.

Tetra Tech. 2004c. Letter Report, Summary of 2003 Field Season Stockpile Activities, St. Paul Island, Alaska. July 23.

U.S. Department of the Interior. 1951. Map of St. Paul Village, New Water Distribution System, New Sewage Disposal System. April.

U.S. Department of the Interior. 1959. Plan, St. Paul Island, Diesel Fuel and Gasoline Storage and Distribution System. Sheet 10 of 15, signed by D.D. Powell (1959), approved by C.R. Lucas (1961).

Woodward-Clyde Consultants, Inc. 1994. Site Inspection Report, St. Paul Island, Alaska. Contract No. DA-CA67-92-D-1017. Delivery Order No. 36. November.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

9/10/04
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at the West Dock Fuel Transfer Facility, TPA Site 9p/Site 51, in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

9/14/04
Date

Tables and Figures

Table 1. Analytical Data Summary for Confirmation Samples from the West Dock Fuel Transfer Facility, TPA Site 9p/Site 51, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
Site 51/TPA Site 9p Confirmation Samples									
SP51-CS-001-040	4	0.02 U	0.02 U	0.02 U	0.02 U	1 U	38	50 U	6.88
SP51-CS-002-040	4	**0.04**	0.17	0.06	0.43	4	**2,600**	340	46.90
SP51-CS-003-040	4	**0.06**	0.18	0.06	0.40	3	**700**	220	15.50
SP51-CS-004-020	2	**0.03**	0.15	0.08	0.38	2	130	220	36.30
SP51-CS-005-020	2	**0.15**	0.54	0.14	0.95	9	**330**	720	24.60
SP51-CS-006-020	2	**0.06**	0.23	0.05	0.39	4	110	280	22.80
SP51-CS-907-040	4	0.02 UJ	0.03 UJ	0.02 UJ	0.19 UJ	3 UJ	130 J	200 J	23.60
SP51-CS-908-040	4	0.04 UJ	0.13 UJ	0.04 UJ	0.32 UJ	2 UJ	110 J	110 J	40.30
Trip Blank Samples									
Trip blank	- -	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	1 UJ	--	--	--
Trip Blank	- -	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
Trip blank	- -	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
Trip blank	- -	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
Method Two Cleanup Level[a]		*0.02*	*5.4*	*5.5*	*78*	*300*	*250*	*10,000*	*400*[e]
Alternative Cleanup Level[b]		*0.5*[c]	*54*	*NA*	*NA*	*1,400*[d]	*2,500*	*NA*	*NA*

Notes:

bold Indicates concentration above one or both cleanup levels. Although reporting limits for benzene sometimes exceeded the ADEC Method Two cleanup level of 0.02 mg/kg, all reporting limits were below the alternative cleanup level of 0.5 mg/kg.

ADEC Alaska Department of Environmental Conservation
bgs Below ground surface
BTEX Benzene, toluene, ethylbenzene, and total xylenes
DPPA Decommissioned Power Plant Annex
DRO Diesel-range organic compounds
GRO Gasoline-range organic compounds
mg/kg Milligrams per kilogram
-- Not analyzed
NA Not available
PAH Polynuclear aromatic hydrocarbon
RRO Residual-range organic compounds
TPA Two-Party Agreement
U The analyte was analyzed for, but not detected above the sample reporting limit
UJ The analyte was analyzed for, but not detected. The associated numerical value is the estimated sample reporting limit
a Cleanup level is from Title 18 of the *Alaska Administrative Code* 75, "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000. Contaminants of concern for this site are limited to BTEX, GRO, DRO, RRO, select PAHs, and lead.
b Cleanup level obtained from ADEC Method Two based on the "Ten Times Rule" applied to the migration to groundwater pathway, as discussed in Section 5.0 of the corrective action plan (National Oceanic and Atmospheric Administration [NOAA] 2003).
c Under the TPA, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg).
d Cleanup level selected is based on more stringent value associated with ingestion and inhalation pathways.
e Although these sites are in an industrial area, NOAA is using the residential cleanup level for lead (400/mg/kg).

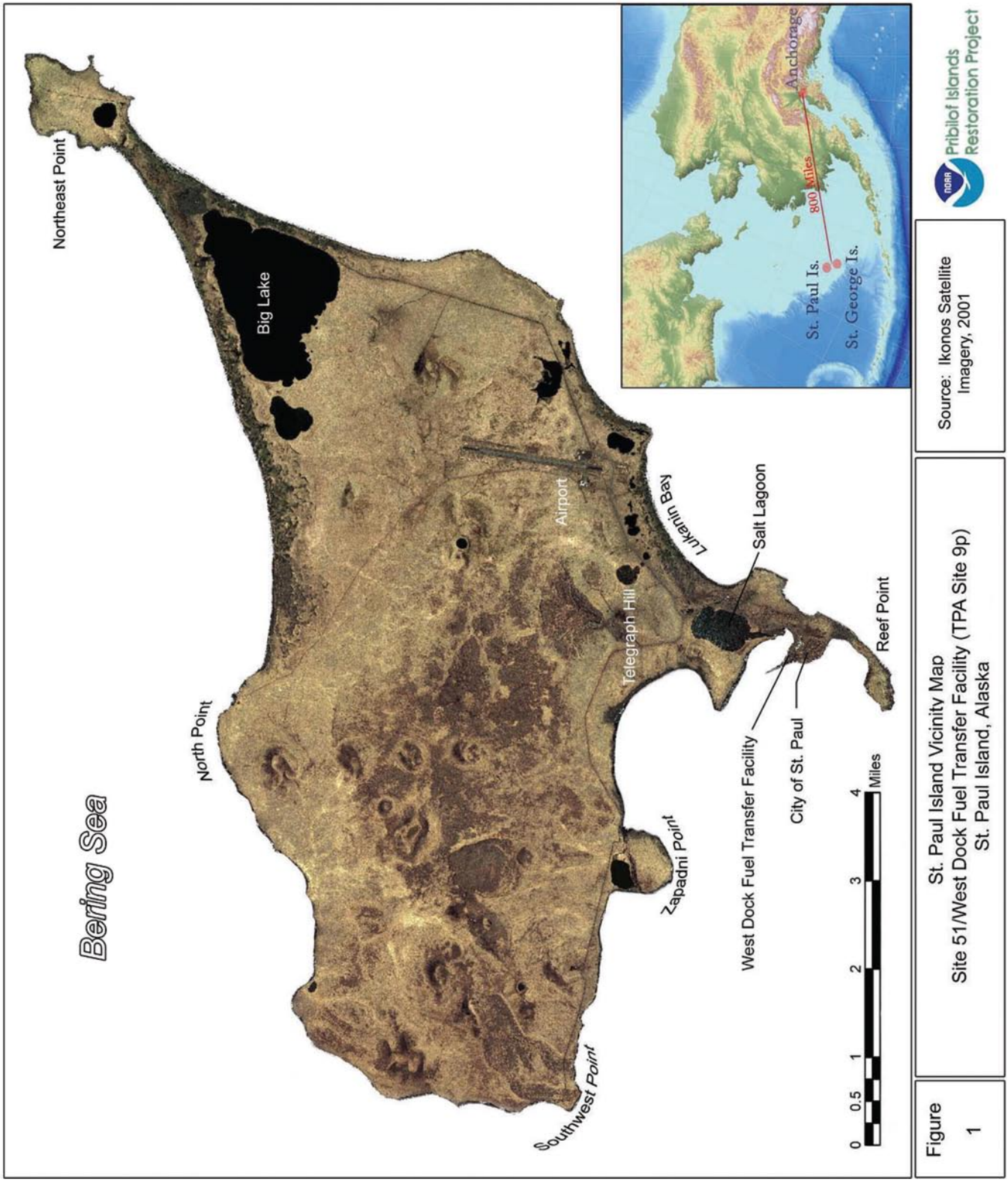


Figure 1

St. Paul Island Vicinity Map
Site 51/West Dock Fuel Transfer Facility (TPA Site 9p)
St. Paul Island, Alaska

Figure 2	Legal Property Description Map West Dock Fuel Transfer Facility Site 51/TPA Site 9p St. Paul Island, Alaska	Sources: BLM Tract (BLM MTPs 1983), TPA 9p Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

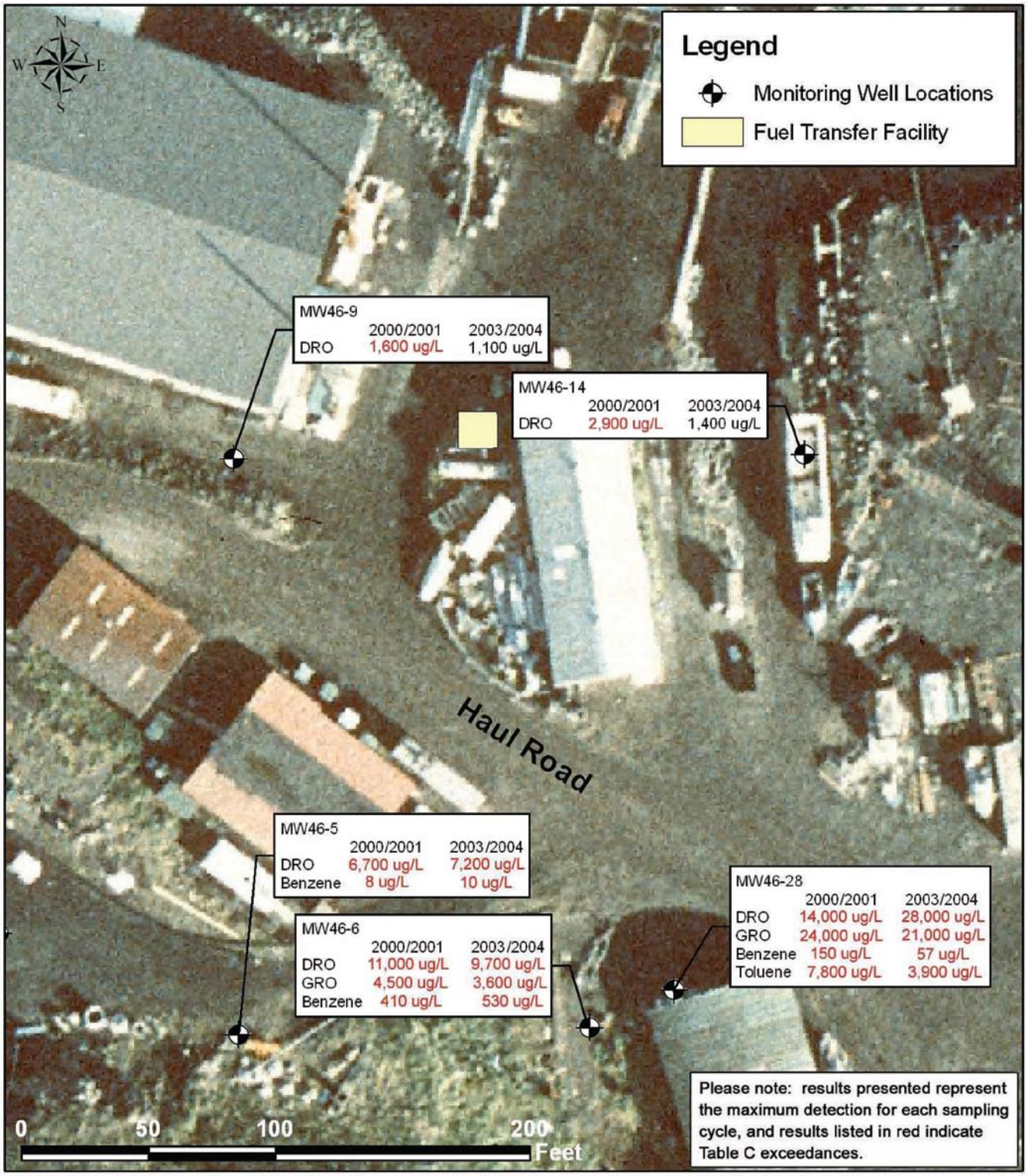


Figure 3	Groundwater Sampling Results West Dock Fuel Transfer Facility Site 51/TPA Site 9p St. Paul Island, Alaska	Sources: Monitoring Well Locations (NOAA GPS 2004), Aerial Photography (Aeromap US 1996).

Pribilof Islands Restoration Project

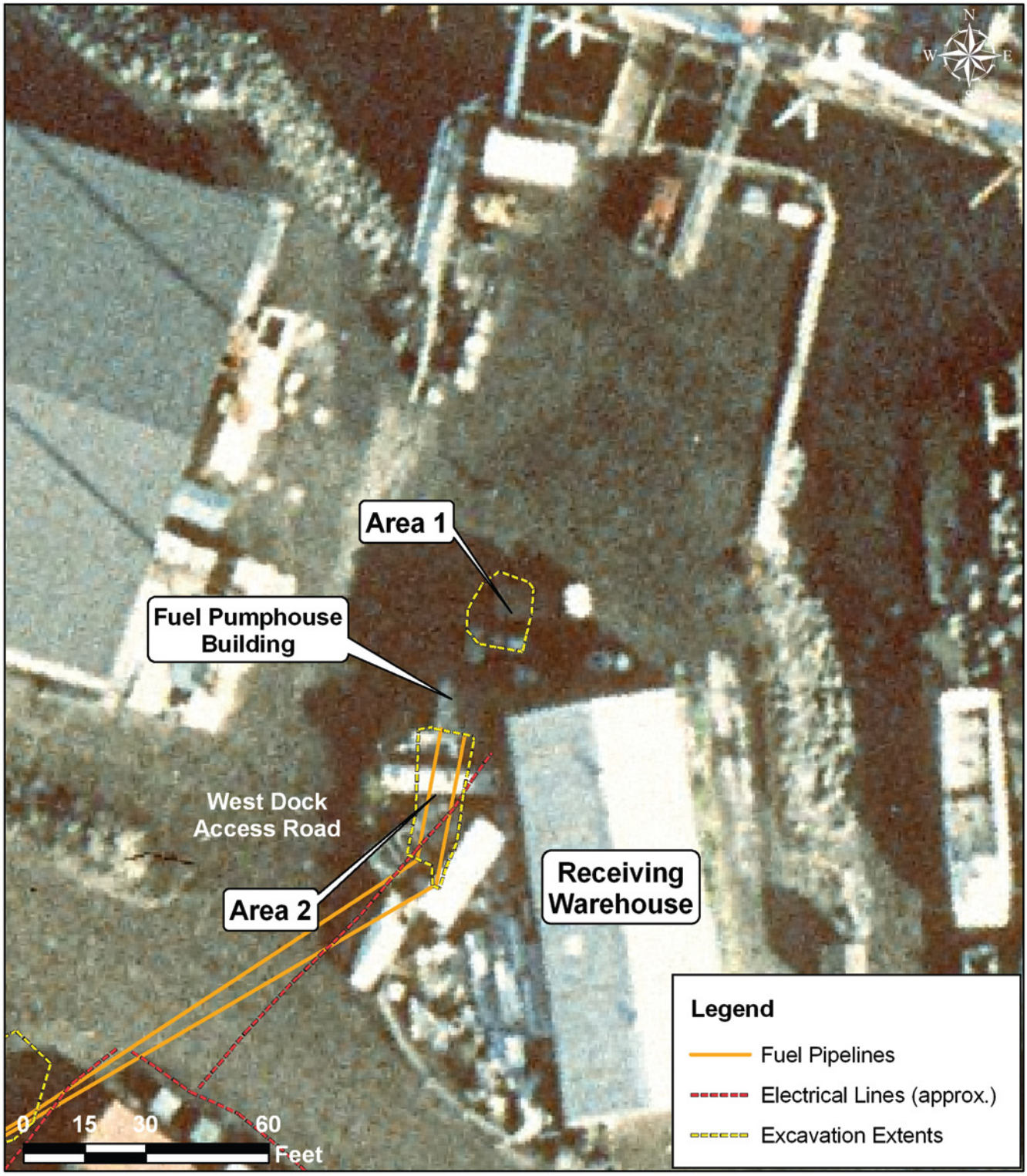


Figure 4	Areas of Excavation West Dock Fuel Transfer Facility Site 51/TPA Site 9p St. Paul Island, Alaska	Sources: Excavation Extents and utility locations (NOAA GPS 2003), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

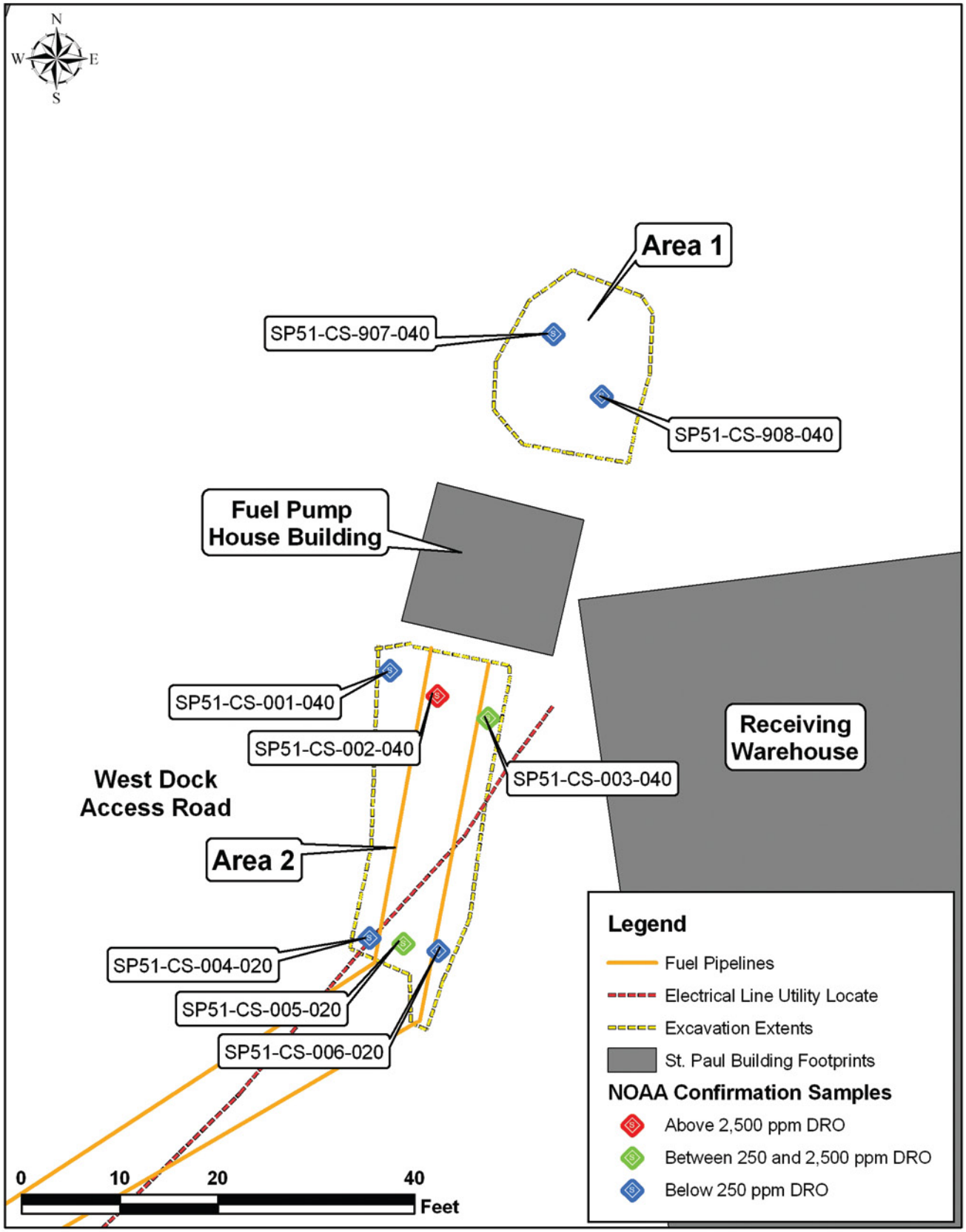


Figure 5	Sampling Location Map West Dock Fuel Transfer Facility Site 51/TPA Site 9p St. Paul Island, Alaska	Sources: Confirmation Samples, Excavation Extents, and Utility Locations (NOAA GPS 2003), Building Footprints (NOAA GIS 2004).

Pribilof Islands Restoration Project

NOAA Site 52
NTPA: Tract 50 Asbestos in Soil

Request for NFRAP, Asbestos Removal, Tract 50,
St. Paul Island, Alaska 1251

Request for NFRAP
Asbestos Removal, Tract 50
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site
NOAA Site 52, Tract 50, Non-Two Party Agreement transite fragments site

Location
St. Paul Island, Alaska. Tract 50 Section 25 Township 35S Range 132W of the Seward Meridian. Tract 50 is located north of the City of St. Paul along the east side of the Salt Lagoon Channel (Figure 1).

Type of contamination
Transite tile fragments containing 25% asbestos.

History
Transite tiles were reportedly removed from one or more U.S. government-owned buildings on Tract 50. These tiles were removed as whole tiles and stacked on Tract 50. Purportedly, vandals broke the tiles into pieces, most no larger than 2”x2”, scattering them about the soil on Tract 50.

Public Law 104-91 requires that all lands transferred or intended for transfer by the National Oceanic and Atmospheric Administration (NOAA) to private parties be cleaned up of contamination, debris and other hazards left by NOAA or its predecessor agencies. In anticipation of the transfer of the real property to Aleut Native American entities, NOAA prepared a Corrective Action Plan (CAP; NOAA 2003) for Transite fragments removal from Tract 50, and implemented the CAP in June and July 2003.

Summary of Site Investigations
NOAA Pribilof Project Office (PPO) personnel inspected and photographed the site on August 2, 2002, and collected a representative broken tile sample. Lab analysis indicated that the tile was composed of sand, paint, mineral filler and binder, and 25% asbestos, identified as chrysotile (Prezant 2002). This level of asbestos content places the Transite fragments under the definition of asbestos containing material (ACM). ACM with an asbestos content above 1% requires removal in accordance with 18 ACC. On September 27, 2002, NOAA surveyed the site using a survey grade global positioning system (GPS) to delineate and map the exact location and total area of ACM contamination (Figure 2).

Summary of Cleanup Actions
In preparation for asbestos removal, NOAA PPO personnel completed the necessary asbestos removal training and certification, and were equipped with protective safety gear. Removal and sampling gear was shipped to the island and staged near the site.

ACM removal commenced on June 28, 2003. First, the contamination zones were marked with pin flags, staked, taped-off, and posted with warning signs. Then trained NOAA personnel, wearing protective gear, manually removed the Transite tile fragments, piece-by-piece, moving in an orderly manner, clearing one section at a time (Figure 3). After the surface fragments were removed, the areas were tilled using a rake to uncover below-surface fragments and remove them. When a section was cleared of Transite tile fragments, it was inspected by an ACM certified observer to verify the removal of all observable fragments. Rain falling throughout the day provided ample wetting of the fragments. At the end of the day the cleanup crew completed cleanup of all visible Transite fragment-contaminated areas and inspected them. Additional removal of fragments took place intermittently until July 12, 2003. The area cleaned up and inspected increased from the intended 9,000 square feet to over 30,000 square feet (Figure 5).

The Transite tile fragments collected were placed in 6-mil asbestos bags, wetted, sealed, and stored in a 55-gallon steel drum.

Air sampling was conducted to comply with EPA and OSHA regulations (US EPA 1996, US EPA 2002, OSHA 1995) and to verify that friable asbestos fibers in the air were below the level of concern for cleanup personnel. Subsequent lab analysis of the samples indicated that exposure to asbestos fibers was much below the level of concern [Prezant 2003].

On July 12, 2003, a third party team consisting of three Tanadgusix Corporation (TDX) management personnel, representing the future landowner, inspected Tract 50. They walked throughout the area looking for remaining Transite tile fragments (Figure 4). After completing the inspection the TDX team concluded that the area was satisfactorily clean. Immediately thereupon, both TDX and NOAA signed a Removal Verification Inspection Form (Attachment 2).

The Transite tile fragments collected at Tract 50 weighed approximately 80 lbs, with an estimated volume of 20 gallons. Additional ACM previously stored on Tract 50 were also wetted, placed in steel drums, marked, labeled, weighed, and prepared for shipment. The total volume of all ACM removed from Tract 50 approximated 300 gallons.

Proper disposal of the Transite tile fragments was coordinated by the NOAA Regional Environmental Compliance Officer, and executed by a hazardous waste shipment and disposal contractor, Onyx Environmental Services (Onyx). A waste shipment record (*i.e.*, manifest) was signed by the shipper and the contractor receiving the waste in Seattle. Onyx sent the drums for final disposal to Waste Management in Arlington, Oregon, a non-hazardous landfill facility. The manifest, properly signed, testifies that the asbestos was received by the landfill facility (Attachment 3).

Recommended Action

All ACM and known sources of ACM have been removed from Tract 50, and hence, NOAA requests a No Further Remediation Action Planned determination from the Alaska Department of Environmental Conservation for NOAA Site 52, Tract 50, Non-Two Party Agreement transite fragments site.

References

NOAA. 2003. *Corrective Action Plan, Removal of Transite Fragments at Tract 50, St. Paul Island, Alaska*. June 2003.

Prezant Associates. 2002. *Laboratory Analysis of Transite Tile Fragment from Track 50, St. Paul Island, Alaska*. August 2002.

Prezant Associates. 2003. *Airborne Asbestos Dust Analysis; Batch # 31818*. July 2003.

US EPA. 1996. *Demolition Practices Under the Asbestos NESHAP*. EPA Web Page http://www.epa.gov/region4/air/asbestos/demolish.htm, April 2003.

US EPA. 2002. *Standard for Waste Disposal for Manufacturing, Fabricating, Demolition, Renovation, and Spraying Operation*. 40 CFR 61.150. July 2002.

US OSHA. 1995. *Asbestos Standard*. 29 CFR 1910.1001

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

4-15-04
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at NOAA Site 52, Tract 50, Non-Two Party Agreement transite fragments site, in accordance with the Agreement and that no further action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

May 3, 2004
Date

Attachment 1

Figures

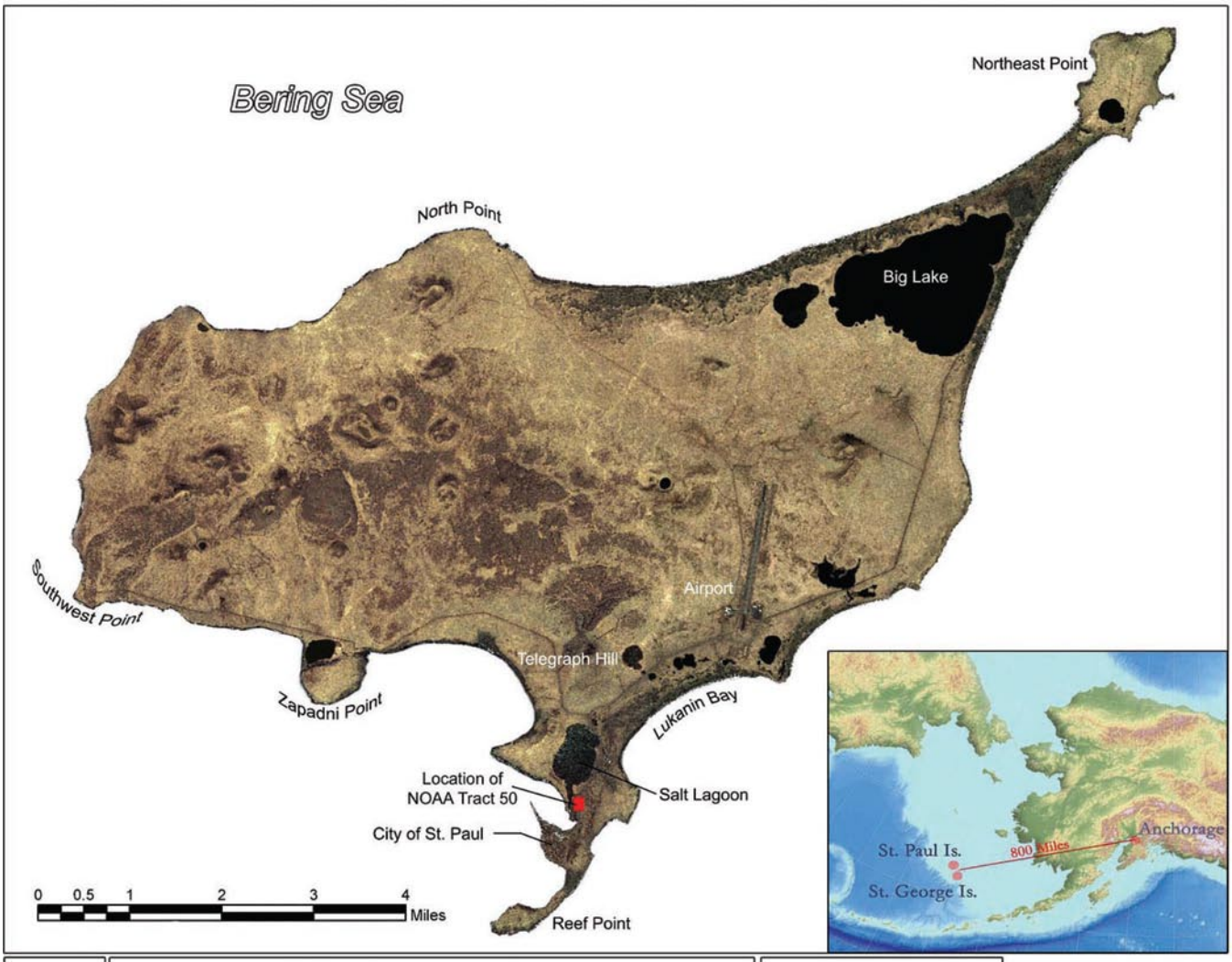


Figure 1	St. Paul Island Vicinity Map Location of NOAA Tract 50 St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001	Pribilof Islands Restoration Project

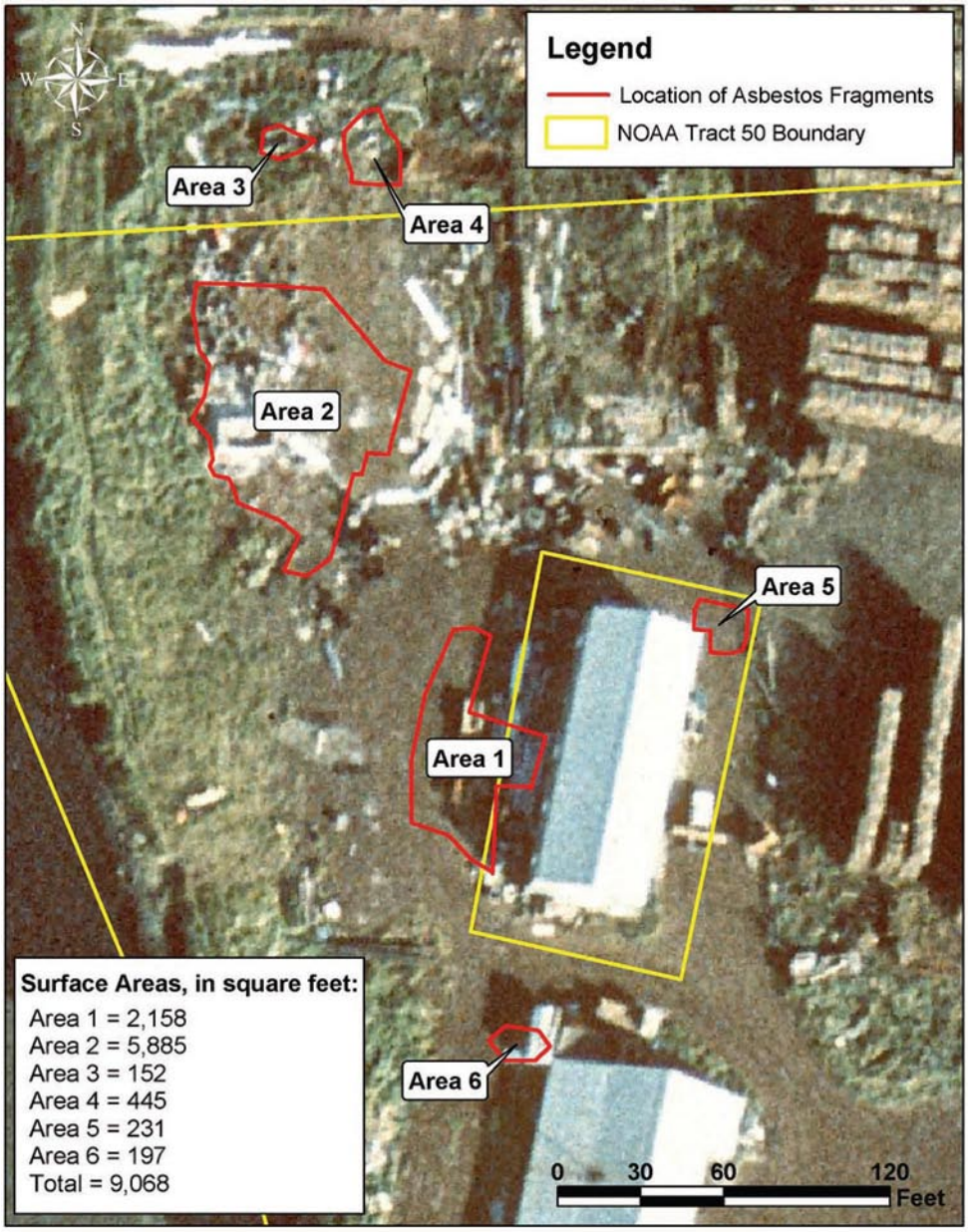


Figure 2	Location of Asbestos Fragment NOAA Tract 50 St. Paul Island, Alaska 9/27/02	Sources: Asbestos Area (NOAA GPS 2002), Aerial Imagery (Aeromap US 1996).	Pribilof Islands Restoration Project

Figure 3. Removal of Transite Fragments

Figure 4. Site Inspection

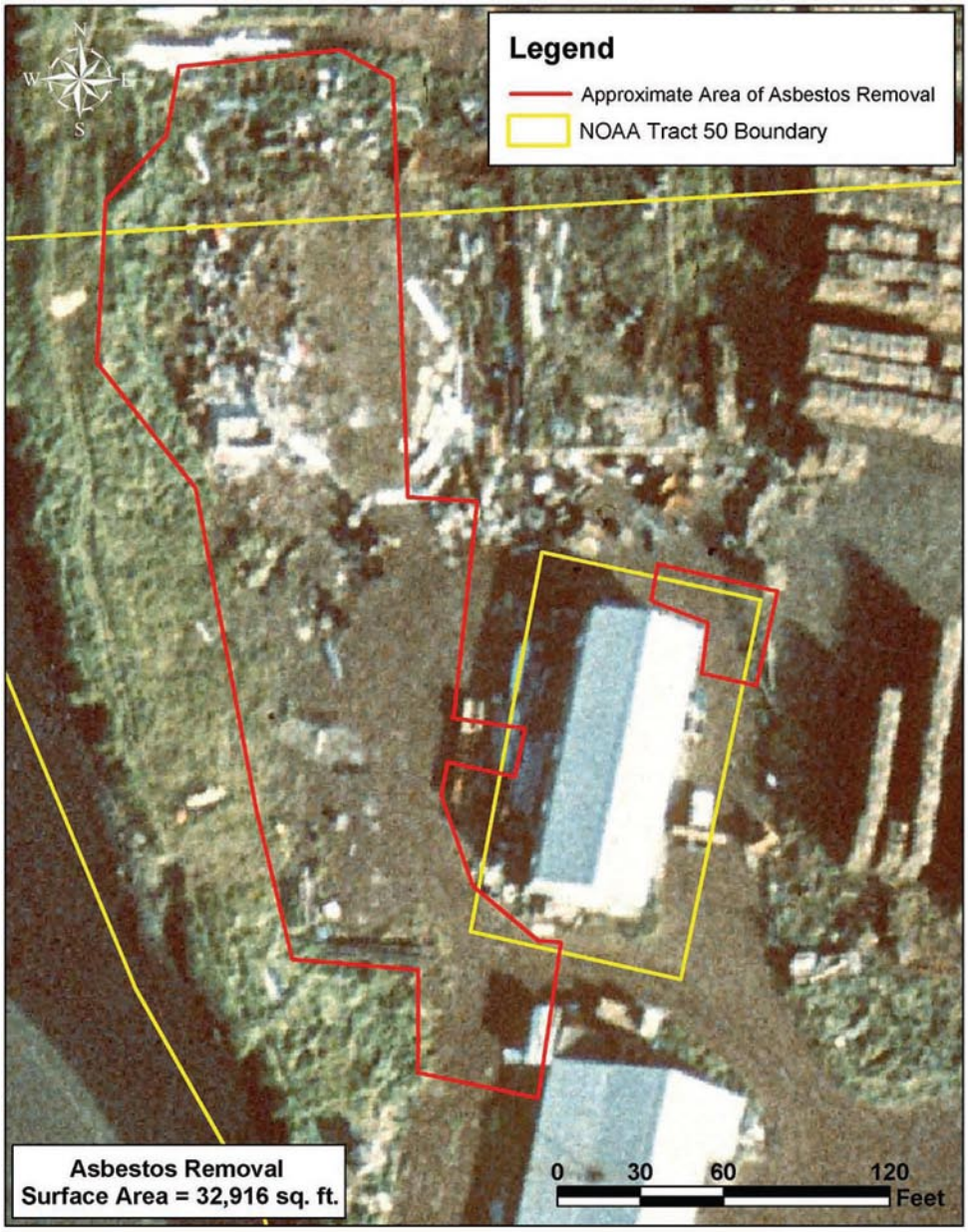


Figure 5	Approximate Area of Asbestos Removal NOAA Tract 50 St. Paul Island, Alaska	Sources: Approximate Area of Asbestos Removal (NOAA GIS 2003), Tract 50 Boundary (BLM 1983), Aerial Imagery (Aeromap US 1996).

Pribilof Islands Restoration Project

Attachment 2
Signed Removal Verification Inspection Form

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office
7600 Sand Point Way N.E
Seattle, Washington 98115
Ph 206-526-6965, fax 206-526-4819

Removal Verification Inspection Form

Site 52/Non Two-Party Agreement - Tract 50 Asbestos in Soil

St. Paul Island, Alaska

Background Information

Surface soil was contaminated with fragments of Transite tiles at a site within Tract 50 and adjacent to the Salt Lagoon channel, near the village of St. Paul Island, Alaska. The fragments contain approximately 25% asbestos. The site is not part of the National Oceanic and Atmospheric Administration (NOAA) Two-Party Agreement (TPA). NOAA is authorized to perform cleanup of the fragments under Public Law No. 104-91 of 1995 and Public Law 106-562 of 2000. Successful removal of the fragments will assist NOAA in obtaining a "No Further Remedial Action Planned" (NFRAP) determination from the Alaska Department of Environmental Conservation (ADEC).

NOAA prepared a Corrective Action Plan (CAP) that outlines the approach for executing the cleanup and disposal of the fragments. ADEC approved the CAP.

NOAA executed cleanup activities under the CAP on June 28, 2003. NOAA staff members involved with the cleanup were:

- Nir Barnea, CIH – Asbestos Supervisor
- Greg Gervais, P.E. – Asbestos Worker II
- Laura Murray – Asbestos Worker II
- Alicia Lomas – Photographer and Videographer

Mr. Barnea, Mr. Gervais, and Ms. Murray performed the fragment cleanup work within the exclusion zone while Ms. Lomas documented the activities with a digital still camera and a digital video camera.

The corrective action included the following:

- staking out the affected area by using Survey Grade Real Time Kinematic GPS;
- taping off the area, and placing caution signs;
- tilling the area with rakes to uncover and remove Transite fragments embedded in the surface soil;
- collecting tile fragments, and storing them in one heavy duty plastic bag inside a 95 gallon plastic overpack drum;

- collecting used personal protective equipment and storing it in one heavy duty plastic bag inside the same drum as the tile fragments; and
- inspecting the area to verify that all tile fragments have been removed.

NOAA will report the results of these activities to the ADEC for acknowledgment of clean closure and to request concurrence for NFRAP designation for the site.

Tract 50 is designated for property transfer from the U.S. Government to Tanadgusix Corporation (TDX) under the Transfer of Property Agreement (TOPA). NOAA requested that TDX assign a representative to participate in the inspection component of the corrective action.

Removal Verification Inspection

I have performed a visual inspection of the Tract 50 Transite fragment site. To the best of my knowledge, the site appears to be free of surface fragments of asbestos-containing Transite.

NIR BARNEA	Ron Philemonoff
Name of NOAA Representative/Inspector (Please Print)	Name of TDX Representative/Inspector (Please Print)
Signature of NOAA Representative Inspector	Signature of TDX Representative/Inspector
12 JUL/03	7-12-2003
Date	Date

Attachment 3
Signed Asbestos Shipment and Disposal Manifest

3602609018 ONYX ENVIRONMENTAL 059 P01 MAR 10 '04 10:14

ONYX
ENVIRONMENTAL SERVICES

14240 Interurban Avenue South * Suite 244 * Tukwila * Washington * 98168
Phone: (877) 652-6292 * Fax: (360) 260-9018

Date: 3/10/04 **# of Pages (including cover sheet):** 2

To: Chris Donohue **Of:** NOAA

Fax #: 206 527-7506

From: Chris Brown

Re:

Chris Brown
Customer Service Representative
Onyx Environmental Services LLC
Tukwila, Washington Branch Office

03/10/2004 10:19AM

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. AK01314900021
Manifest Document No. 23027
2. Page 1 of 1
TUK 23027

3. Generator's Name and Mailing Address
NOAA/NOS/ORR
7600 SAND POINT WAY NE
SEATTLE, WA 98115
SITE ADDRESS: NOAA/NOS/ORR
1 POLOVINA WAY
ST. PAUL ISLAND, AK 99660
ATTN: MINH TRINH

4. Generator's Phone (907) -546-5019

5. Transporter 1 Company Name
~~WESTERN PIONEER~~ Northland
6. US EPA ID Number
WAD988175005
~~WAD089556801~~
A. Transporter's Phone 206-789-1830

7. Transporter 2 Company Name
ONYX E.S.
8. US EPA ID Number
KS0008336005
~~WAS993733205~~
B. Transporter's Phone 973-347-7111

9. Designated Facility Name and Site Address
COLUMBIA RIDGE LANDFILL
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812
10. US EPA ID Number
ORD987173457
C. Facility's Phone 5414543282

11. Waste Shipping Name and Description

	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. RQ ASBESTOS 9 NA2212 PG III RQ (ASBESTOS)	3	Steel drum	255 gal, 2449 lbs	85 gal
b. RQ Asbestos 9 NA 2212 PG III RQ (asbest.)	~~2~~ 8	Steel drum	~~44~~ gal 2204 lbs	55 gal
c.				
d.				

D. Additional Descriptions for Materials Listed Above
A. CRL#, ESI# 03-257-20, ERG# 171
522479/23729CV

E. Handling Codes for Wastes Listed Above
CERTIFICATE OF DISPOSAL REQUIRED

15. Special Handling Instructions and Additional Information
EMERGENCY INFORMATION CONTACT (208) 363-9000 OR (425) 771-0452.
"Shippers Certification per 49CFR 172.204 - This is to certify that the above-named materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. Signature in box 16 of this manifest constitutes certification of this statement by the shipper."

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.
Printed/Typed Name: Nir Barnea
Signature: Nir Barnea
Month Day Year: 11 10 03

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Luke Donkersloot
Signature:
Month Day Year: 11 11 03

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: JASON SIMPSON
Signature: Jason Simpson
Month Day Year: 02 10 04

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19
Printed/Typed Name: Carrie Burrell
Signature: Carrie Burrell
Month Day Year: 02 10 04

GENERATOR
TRANSPORTER
FACILITY

ORIGINAL - RETURN TO GENERATOR

03/10/2004 10:19AM

NOAA Site 53
TPA Site 9q: Tract A Lot 101

Request for NFRAP, House 101, TPA Site 9q/Site 53,
St. Paul Island, Alaska 1265

Letter from Louis Howard to John Lindsay RE: Request for No Further Remedial Action Planned Determination Rescinded House 101 TPA Site No. 9q, St. Paul Island. Dated December 2, 2005 1275

Letter from John Lindsay to Louis Howard RE: Review and Approval of Corrective Action Plan for the Removal of Lead Contaminated Soil at Teacher Houses 101 and 103, and the Duplex, Lead Contaminated Soils Site (NOAA Site 60, Non-TPA), St. Paul Island, Alaska, dated May 15, 2006.....1277

Request for NFRAP
House 101, TPA Site 9q/Site 53
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site: House 101, also know as Two Party Agreement (TPA) Site 9q and National Oceanic and Atmospheric Administration (NOAA) Site 53

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. On the island, House 101 is located on the southeast portion of Village Hill along Gorbatch Street in the City of St. Paul, near City Hall (170° 16' 54.84" W longitude, 57° 7' 15.38" N latitude; Figure 1).

Legal Property Description: The location of House 101 and the previously associated underground storage tank (UST) is Lot 1, Block 9, U.S. Survey No. 4943, Alaska, Tract "A", St. Paul Townsite, accepted by the Bureau of Land Management August 2, 1968 (Figure 2). The federal government currently owns the associated surface and subsurface property.

Type of Release: Potential sources and release mechanisms include: 1) diesel fuel spills occurring during UST fueling; and 2) diesel fuel leaks occurring from the UST or its associated piping.

History and Background:
The 1940s era house served as quarters for government employees, although in subsequent years it was occupied by island school teachers. Sometime after 1987, private parties assumed beneficial rights to the house and leased it to the Federal Aviation Administration. The building is currently unoccupied. An UST was installed on House 101 property to store heating oil for the home. NOAA proposed to remove the UST in anticipation of the transfer of the real property under the Transfer of Property Agreement (TOPA; NOAA 1984) to Aleut Native American entities. NOAA prepared a corrective action plan (CAP; NOAA 2002) for the removal of the UST at House 101, implemented the CAP in October 2002, and provided a corrective action report (CAR; NOAA 2003). In 2004, the National Park Service's Historic American Building Survey team measured, sketched, and photographed this building.

Summary of Site Investigations:
House 101 was only recently identified as a site of concern under Public Law 104-91. Therefore, no previous soil samples were collected at the House 101 property.

Groundwater flow has not been well described for this site. Several groundwater monitoring wells are in the general vicinity of House 101. NOAA contractors conducted quarterly groundwater monitoring from September 2000 to September 2001 at wells MWA-4 and MWA-6 (Figure 3). Low levels of diesel-range organic compounds (DRO) well below the Table C cleanup level of 1500 µg/L were detected in both wells (IT Alaska Inc. 2002). Contractors also conducted quarterly groundwater monitoring from October 2003 to July 2004, sampling wells MWA-4, MWA-6, MWA-7, and MWA-8 (Figure 3). Data is currently available from the first three quarters. Petroleum constituents were not detected in MWA-4 or MWA-6. Low levels of DRO were detected in MWA-7 and MWA-8. A full report on 2003-2004 sampling events will be available late in 2004.

Summary of Applied Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2000). Under the TPA, for benzene NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). ADEC uses 15 feet below ground surface (bgs) to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2000; 18 AAC 75.340 (j)(2)). Therefore NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 feet to address the inhalation and ingestion pathways. Cleanup criteria were applied to the maximum extent practicable (18 AAC 75.325 (f), 18 AAC 75.990).

Summary of Cleanup Actions:
Excavation activities began at House 101 (Figure 4) on October 23, 2002 by NOAA contractor, Bering Sea Eccotech, Inc. (BSE). Contaminated soils were removed by an excavator, loaded on dump trucks, and hauled to the petroleum-contaminated soil (PCS) stockpile at the Blubber Dump (Figures 5 and 6). The contaminated soils were eventually treated in an enhanced thermal conduction system and disposed of at the local landfill (BSE 2003). After the UST was exposed, approximately 800 gallons of diesel fuel were pumped out of it prior to its removal. The fuel was given to community members of the City of St. Paul. On October 24, 2002, the UST was removed from the ground (Figure 7), placed directly on a flat bed truck, and transported to BSE's garage facility at the St. Paul airport.

Following tank removal, the excavation was increased to a depth of 16 feet bgs. Excavation to greater depths was not feasible with available on-site equipment. Additional soils could not be removed from the north excavation sidewall without jeopardizing the integrity of an adjacent concrete walkway and the foundation of House 101. A total of 65 cubic yards (yd^3) of soil was removed from the UST excavation.

Following the removal of all accessible contaminated soils, six confirmation samples were collected to confirm the condition of remaining in-place soils (Figure 8, Tables 1 and 2). Gasoline-range organics (GRO), benzene, toluene, etheylbenze, and xylenes (BTEX), and polynuclear aromatic hydrocarbons (PAHs) were not detected in any of the six samples collected from the excavation.

DRO was detected above the ADEC Method Two cleanup level of 250 mg/kg in sample SNPTA101SS05, with a concentration of 5,040 mg/kg. This sample was collected 8 feet bgs from the north wall of the excavation, adjacent to the House 101 foundation. Further excavation in the area of this sample was not practicable.

Confirmation sample SNPTA101SS01 and duplicate sample SNPTA101SS02 revealed that DRO levels at 16 feet bgs (excavation limit) were below cleanup levels, 236 mg/kg and 241 mg/kg, respectively. DRO was not detected in samples SNPTA101SS03, SNPTA101SS04, and SNPTA101SS06, collected from the west excavation wall (14 feet bgs), the south excavation wall (10 feet bgs), and the east end of the excavation bottom (5.5 feet bgs), respectively.

RRO was detected in one sample (SNPTA101SS02) at 31.3 mg/kg, well below the Method Two cleanup level of 10,000 mg/kg RRO. This was the only sample containing RRO above laboratory detection level.

The removed UST was cleaned with soap and water and cut into manageable pieces for recycling off-island. In accordance with Section 6.2.6 in the corrective action plan (NOAA 2002), the rinsate generated during UST cleaning was transported to the Blubber Dump PCS stockpile and discharged onto the stockpile and ultimately treated.

The UST excavation was backfilled with clean fill material obtained from the scoria quarry at Telegraph Hill on St. Paul Island. The fill was placed in the excavation in 6- to 8-inch lifts and compacted with the excavator bucket. The site was restored to grade.

The source of the contamination (*i.e.*, a 1000-gallon UST) has been successfully removed from the House 101 site. All contaminated soils associated with the UST have been removed from the site to the extent practicable, successfully treated, and ultimately disposed of at the Tract 42 landfill. Soils containing DRO concentrations exceeding the site cleanup level at the northwest excavation sidewall indicate the potential for contamination to extend below the existing structure; however, this area is inaccessible without compromising the integrity of House 101.

Recommend Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action at House 101, TPA Site 9q/Site 53 in accordance with the Agreement and that Alaska Department of Environmental Conservation (ADEC) requires no further remedial action plan from NOAA.

References:

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Contaminated Sites Program*. July 17, 1991.

ADEC. 2000. Title 18 of the *Alaska Administrative Code* 75, Articles 3 and 9. *Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. Amended through October 28, 2000.

Bering Sea Eccotech, Inc. 2003. *Enhanced Thermal Conduction Yearly Report, St. Paul Island, Initial Draft*. February.

IT Alaska Corporation. 2002. Draft Annual Groundwater Monitoring Report 2001, St. Paul Island, Alaska. March.

National Oceanic and Atmospheric Administration (NOAA). 1984. Transfer of Property Agreement.

NOAA. 1996. *Pribilof Islands Environmental Restoration Two-Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26.

NOAA. 2002. *Corrective Action Plan, UST Removals, Selected U.S. Government Sites*, St Paul Island, Alaska. August 13.

NOAA. 2004. *UST Removal and Corrective Action Report TPA Site 9-Q – House 101 St. Paul Island, Alaska*. February 9.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

9/30/04
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at House 101, TPA Site Number 9q/Site 53 in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

10/11/04
Date

Tables and Figures

Table 1: Petroleum Hydrocarbon Analytical Data Summary for Confirmation Samples, House 101, TPA Site 9q/ Site 53, St. Paul Island, Alaska

Sample#	Sample Depth (feet)	GRO (AK101) (mg/kg)	Benzene (EPA 8021B) (mg/kg)	Toluene (EPA 8021B) (mg/kg)	Ethylbenzene (EPA 8021B) (mg/kg)	Total Xylene (EPA 8021B) (mg/kg)	DRO (AK102) (mg/kg)	RRO (AK103) (mg/kg)
SNPTA101SS01	16	ND(5.07)	ND(0.0253)	ND(0.101)	ND(0.101)	ND(0.101)	236	ND(26.0)
SNPTA101SS02	16	ND(5.53)	ND(0.0277)	ND(0.111)	ND(0.111)	ND(0.111)	241	31.3
SNPTA101SS03	14	ND(4.91)	ND(0.0246)	ND(0.0982)	ND(0.0982)	ND(0.0982)	ND(26.5)	ND(26.5)
SNPTA101SS04	10	ND(5.64)	ND(0.0282)	ND(0.113)	ND(0.113)	ND(0.113)	ND(25.4)	ND(25.4)
SNPTA101SS05	8	ND(6.81)	ND(0.0340)	ND(0.136)	ND(0.136)	ND(0.136)	*5,040*	ND(249)
SNPTA101SS06	3.5	ND(12.4)	ND(0.0618)	ND(0.247)	ND(0.247)	ND(0.247)	ND(26.3)	ND(26.3)
SNPTATB01 (trip blank)	-	ND(2.55)	ND(0.0127)	ND(0.0509)	ND(0.0509)	ND(0.0509)	NA	NA

Notes:
1. ND=non-detect. The number provided in parentheses is the practical quantitation limit (PQL).
2. mg/kg = milligrams per kilogram.
3. *Indicates result above regulatory criteria*
4. NA=Not Applicable

Table 2. Polynuclear Aromatic Hydrocarbon Analytical Data Summary for Confirmation Samples, House 101, TPA Site 9q/Site 53, St. Paul Island, Alaska

Sample#	Sample Depth (feet)	Benzo(a) Anthra-cene	Benzo[a] pyrene	Benzo[b] Fluoran-thene	Benzo[k] fluoran-thene	Chrysene	Dibenzo [a,h] anthra-cene	Fluorene	Indeno [1,2,3-c,d] pyrene	Naph-thalene
SNPTA101SS01	16	ND (0.648)	ND (0.648)	ND (0.648)	ND (1.30)	ND (0.648)	ND (0.907)	ND (0.648)	ND (0.648)	ND (0.907)
SNPTA101SS02	16	ND (0.645)	ND (0.645)	ND (0.645)	ND (1.29)	ND (0.645)	ND (0.902)	ND (0.645)	ND (0.645)	ND (0.902)
SNPTA101SS03	14	ND (0.663)	ND (0.663)	ND (0.663)	ND (1.33)	ND (0.663)	ND (0.928)	ND (0.663)	ND (0.663)	ND (0.928)
SNPTA101SS04	10	ND (0.635)	ND (0.635)	ND (0.635)	ND (0.635)	ND (0.635)	ND (0.890)	ND (0.635)	ND (0.635)	ND (0.890)
SNPTA101SS05	8	ND (0.622)	ND (0.622)	ND (0.622)	ND (1.24)	ND (0.622)	ND (0.870)	ND (0.622)	ND (0.622)	ND (0.870)
SNPTA101SS06	3.5	ND (0.657)	ND (0.657)	ND (0.657)	ND (1.31)	ND (0.657)	ND (0.902)	ND (0.657)	ND (0.657)	ND (0.920)
SNPTATB01 (trip blank)	-	NA	NA	NA	NA	NA	NA	NA	NA	NA

1. ND=non-detect. The number provided in parentheses is the practical quantitation limit (PQL).
2. mg/kg = milligrams per kilogram.
3. *Indicates result above regulatory criteria*
4. Shading indicates instances where the PQL is higher than the applicable cleanup level.
5. NA=Not Applicable

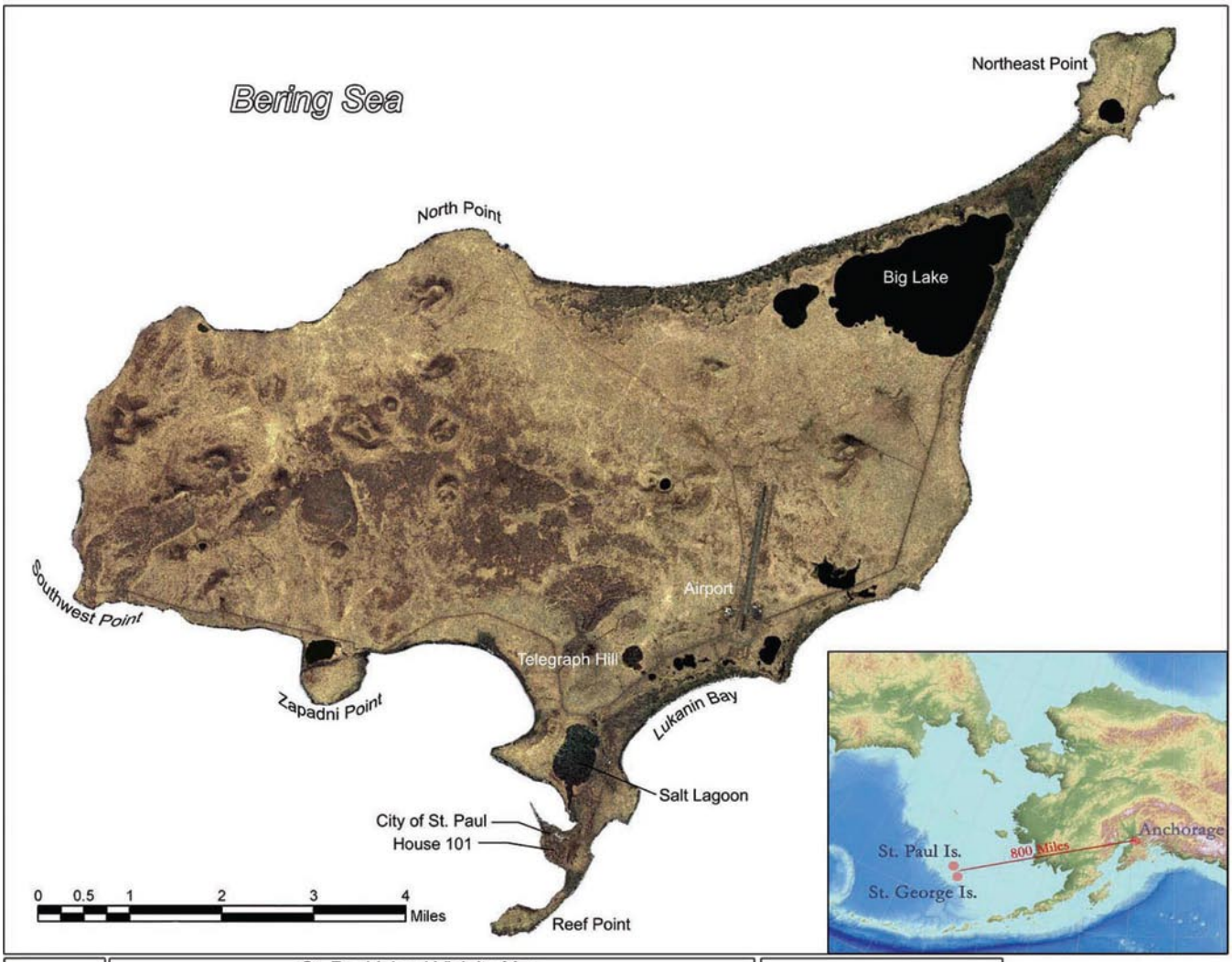


Figure 1	St. Paul Island Vicinity Map Location of House 101 NOAA Site 53/TPA Site 9q St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001	Pribilof Islands Restoration Project

Figure 2	Legal Property Description Map House 101 UST NOAA Site 53/TPA Site 9q St. Paul Island, Alaska	Sources: BLM Tracts (BLM MTPs 1983), TPA 9q Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

Figure 3	Groundwater Sampling Results House 101 UST NOAA Site 53/TPA Site 9q St. Paul Island, Alaska	Sources: Well locations and Excavation Extent (NOAA GPS 2002/2004), Aerial photo (Aeromap US 1996).

Pribilof Islands Restoration Project

Figure 4. House 101, general view

Figure 5. Utility lines and petroleum-stained soil in the UST excavation

Figure 6. Excavation of petroleum-contaminated soil with a maximum depth of 16 feet below grade

Figure 7. Removed 1000-gallon UST

FRANK H. MURKOWSKI, GOVERNOR
555 Cordova Street
Anchorage, AK 99501
PHONE: (907) 269-7552
FAX: (907) 269-7649
http://www.dec.state.ak.us/

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

File No.: 2644.38.023.17

December 2, 2005

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-0070

RE: Request for No Further Remedial Action Planned Determination Rescinded House 101 TPA 9q Site 53, St. Paul Island

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (ADEC) received a request for no further action at TPA 9q (Site 53) with documentation on October 8, 2004, for review and comment. ADEC granted a No Further Remedial Action Planned (NFRAP) determination based on its review. Due to The November 15, 2005, LBP – Risk Assessment and Asbestos Air Monitoring Report which identified lead contaminated soil at 3,300 mg/kg (SP-101-S4) and 1,200 mg/kg (SP-101-S2), ADEC is exercising its rights under A.S. 46.03, 18 AAC 75, to require NOAA to conduct additional site assessment, remediation, and/or other necessary actions deemed appropriate by ADEC.

The unrestricted use or residential cleanup level for lead in soil is 400 mg/kg which is being exceeded at the site. The October 2004 TPA 9q (Site 53) NFRAP determination is formally rescinded and ADEC is requiring NOAA to submit a corrective action plan for review and comment.

Please contact me with any questions or concerns directly at (907) 269-7552.

Sincerely,

Louis Howard
Project Manager
Federal Facilities Section

RECEIVED
DEC 0 5 2005

1200-01-C.2.a-0980

G:\SPAR\SPAR-CS\38 Case Files (Contaminated Sites)\2644 St. Paul Island\2644.38.023.17 TPA 09Q Tract A Lot 101\02-DEC-2005 St. Paul House 101 TPA 9q Site 53 NFRAP rescinded.doc

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office
7600 Sand Point Way N.E.
Seattle, Washington 98115
Ph 206-526-6965, fax 206-526-4819

May 15, 2006

Mr. Louis Howard
Project Manager
Alaska Department of Environmental Conservation
Division of Spill Prevention and Response
Contaminated Sites Program
555 Cordova Street
Anchorage, AK 99501-2617

Subject: Review and Approval of *Corrective Action Plan for the Removal of Lead Contaminated Soil at Teacher Houses 101 and 103, and the Duplex, Lead Contaminated Soils Site (NOAA Site 60, Non-TPA)*, St. Paul Island, Alaska, dated May 15, 2006

Dear Mr. Howard:

Attached please find two hard copies and one CD containing a copy of the corrective action plan (CAP). NOAA requests your review at the earliest possible time. NOAA will finalize this CAP when in receipt of your approval.

The site within the scope of this CAP is located at three residential buildings in St. Paul village. Teacher Houses 101 and 103 reside on Village Hill, east of the City of St. Paul administrative building while the Duplex is located east of the Headstart Building. NOAA removed underground storage tanks (USTs) and petroleum contaminated soil (PCS) to the extent practicable from these locations in 2002 and 2003 as the corrective actions for NOAA Sites 24, 53, and 55. NOAA received conditional closure status from ADEC for these three UST/PCS sites in 2004 and 2005.

NOAA identified lead contamination in surface and near-surface soil along the buldings' drip lines during environmental due diligence activities associated with property transfer. NOAA suspects peeling lead-based paint (LBP) from these structures as the lead soil contamination source. Consistent with our recent discussions, NOAA Site 60 includes the lead contaminated soil at these buildings.

NOAA will characterize surface and near-surface soil along the buildings' drip lines for lead. NOAA will remove lead contaminated soil greater than the State of Alaska residential cleanup

level of 400 milligrams per kilogram, to a maximum depth of two feet below ground surface. Lead contamination deeper than two feet will not be removed, but its presence will be delineated using a visible marker such as perforated plastic, prior to backfilling lead soil excavations with clean scoria. The corrective action will involve disposing of lead contaminated soil off-island if designated a characteristic hazardous waste, or on-island by landfilling in NOAA's Tract 42 if not designated a hazardous waste. NOAA anticipates completing the corrective action at this site during the 2006 field season.

If you have any questions, please do not hesitate to contact me either in writing, or at (206) 526-4560.

Sincerely,

John A. Lindsay, Manager
Pribilof Project Office

Enclosures

cc: St. Paul RAB Members (CD only)
Leslie Simmons, ADEC
NOAA Administrative Record

NOAA and ADEC agreed that lead contaminated soil around the building drip line at this location would be addressed by NOAA Site 60 / NTPA: Lead Contaminated Soils. Accordingly, NOAA Site 53 / TPA Site 9q has retained its conditional closure status.

NOAA Site 54
TPA Site 9r: Tract A Lot 102

Request for NFRAP, House 102, TPA Site 9r/Site 54,
St. Paul Island, Alaska 1283

Request for NFRAP
House 102, TPA Site 9r/Site 54
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site: House 102, also known as Two Party Agreement (TPA) site 9r and National Oceanic and Atmospheric Administration (NOAA) Site 54.

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. On the island, House 102 is located on the southeast portion of Village Hill along Gorbatch Street in the City of St. Paul, near City Hall (170° 16' 54.75" W longitude, 57° 7' 14.71" N latitude; Figure 1).

Legal Property Description: The location of House 102 and the previously associated underground storage tank (UST) is Lot 2, Block 9, U.S. Survey No. 4943, Alaska, Tract "A", St. Paul Townsite, accepted by the Bureau of Land Management August 2, 1968 (Figure 2). The federal government currently owns the associated surface and subsurface estate.

Type of Release: Potential sources and release mechanisms include: 1) diesel fuel spills occurring during UST fueling; and 2) diesel fuel leaks occurring from the UST or its associated piping.

History and Background:
The 1940s era house served as quarters for government employees, although in subsequent years it was occupied by island school teachers. Sometime after 1987, island entities assumed beneficial rights to the house and rented it to various individuals. An UST was installed on House 102 property to store heating oil for the home. NOAA proposed to remove the UST in anticipation of the transfer of the real property under the Transfer of Property Agreement (TOPA; NOAA 1984) to Aleut Native American entities. NOAA prepared a corrective action plan (CAP; NOAA 2003) for the removal of the UST at House 102, implemented it in July 2003, and provided a corrective action report (CAR; NOAA 2004).

Summary of Site Investigations:
House 102 was only recently identified as a site of concern under Public Law 104-91. Therefore, no previous soil samples were collected in the vicinity of House 102. Visual observations, however, indicated the presence of contaminated soil near the UST fill pipe.

Groundwater flow has not been well described for this site. Several groundwater monitoring wells are in the general vicinity of House 102. NOAA contractors conducted quarterly groundwater monitoring from September 2000 to September 2001 at wells MWA-4 and MWA-6 (Figure 3). Low levels of diesel-range organic compounds (DRO) well below the Table C cleanup level of 1500 µg/L were detected in both wells (IT Alaska Inc. 2002). Contractors also conducted quarterly groundwater monitoring from October 2003 to July 2004, sampling wells MWA-4, MWA-6, MWA-7, and MWA-8 (Figure 3). Data is currently available from the first three quarters. Petroleum constituents were not detected in MWA-4 or MWA-6. Low levels of DRO were detected in MWA-7 and MWA-8. A full report on 2003-2004 sampling events will be available late in 2004.

Summary of Applied Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2003). Under the TPA, for benzene NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). ADEC uses 15 feet below ground surface (bgs) to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (18 AAC 75.340 (j)(2)). Therefore, NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 feet to address the inhalation and ingestion pathways. Cleanup criteria were applied to the maximum extent practicable (18 AAC 75.325 (f), 18 AAC 75.990).

Summary of Clean up Actions

Excavation activities at House 102 were initiated on July 24, 2003, and completed on July 25, 2003. Excavation was conducted in the area of the former UST located on the south side of the residence (Figures 3). Utilities in the area were identified before excavation began, and at various times throughout the removal action when unknown lines were discovered. Following utility locates, appurtenances associated with the UST were disconnected, and the excavation began (Figure 4).

Excavation was conducted using a track-mounted excavator. Dump trucks carried the excavated petroleum-contaminated soils (PCS) to the NOAA PCS stockpile located near the St. Paul landfill. In the first stage of the excavation, the UST was uncovered and removed (Figure 5). The contents of the UST were identified as fresh diesel fuel, which was reused by the current tenant of the residence in a new aboveground storage tank (AST; Figure 6).

Initial areas of excavation were selected based on the presence of the UST, while the extent of excavation was determined based on thin-layer chromatography (TLC) screening sample analyses (NOAA 2002) as well as visual and olfactory observations, proximity to structures, and excavator access to the area. Upon removal of the UST, the excavation was expanded based on TLC screening sample analyses as well as visual and olfactory observations. If contaminant concentrations remained above ADEC Method Two cleanup levels based on TLC screening sample analyses, additional excavation was conducted unless further excavation was prevented by equipment limitations or the presence of obstructions.

An unidentified cement utility line was discovered at approximately 3 feet bgs along the southern boundary of excavation (Figure 4). Utility locate personnel from the City of St. Paul could not determine whether the line was active. Excavation continued downward to a depth of approximately 18 feet bgs, where the excavator could no longer operate safely. The excavation, although limited by the presence of obstructions including structures (building foundations) and buried utility lines, was expanded laterally until TLC screening sample analyses indicated contaminant concentrations were below ADEC Method Two cleanup levels, at which time confirmation samples were taken.

Eight confirmation samples and three field duplicate samples were collected from the bottom and sidewalls of the excavation (Figure 7) for laboratory analyses including benzene, toluene, ethyl benzene, and xylene (BTEX); DRO; gasoline range organics (GRO); residual range organics (RRO); select polynuclear aromatics hydrocarbons (PAHs); and lead. Confirmation samples indicated DRO concentrations that varied from not detected to 8,300 mg/kg; two of the eight samples collected from this area exceeded the ADEC Method Two cleanup level of 250 mg/kg. The elevated concentrations of DRO were detected in samples SP54-CS-007-180 and SP54-CS-008-180, which were collected from the bottom of the excavation at 18 feet bgs, the limit of the excavator reach. Concentrations for all other contaminants were below the ADEC Method Two cleanup levels. Laboratory reporting limits were below ADEC Method Two cleanup levels for all analyses except benzene. For benzene, a reporting limit of 0.1 mg/kg or lower was achieved, which is above the current ADEC Method Two cleanup level of 0.02 mg/kg, but below the alternative cleanup level (*i.e.*, the State of Alaska cleanup level in effect in 1991) of 0.5 mg/kg. Analytical results are summarized in Tables 1 and 2.

A total of approximately 50 cubic yards (CY) of PCS was removed from the excavation; PCS was removed to the extent practicable given equipment limitations and site conditions. The excavation was backfilled with clean soils from NOAA Telegraph Hill quarry. The material was brought in by trucks, dumped into the excavation, and compacted by the excavator. The area of excavation was restored to its original grade, and a new AST was installed at this location by the house occupant. Backfill and site restoration activities were completed on July 25, 2003.

Recommended Action:

In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action at House 102, TPA 9r/Site 54 in accordance with the Agreement and that ADEC requires no further remedial action plan from NOAA.

References:

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels. Contaminated Sites Program*. July 17.

ADEC. 2003. 18 AAC 75, Articles 3 and 9. *Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. Effective date January 30, 2003.

IT Alaska Inc. 2002. *Draft Annual Groundwater Monitoring Report 2001, St. Paul Island, Alaska*. March.

National Oceanic and Atmospheric Administration (NOAA). 1984. Transfer of Property Agreement.

NOAA. 1996. *Pribilof Islands Environmental Restoration Two-Party Agreement*. Attorney General's Office File No. 66-1-95-0126. January 26.

NOAA. 2002. *Standard Operating Procedure for the Analysis of Soils and Sediments for Diesel-Range Organics by Thin Layer Chromatography*. September 5.

NOAA. 2003. *Corrective Action Plan for Underground Storage Tank Removals at Tract A House 102 (TPA Site 9r) and Duplex Building and Former E-Shop (Parcel 6F) TPA Site 9i, St. Paul Island, Alaska*. April 29.

NOAA. 2004. *Final Corrective Action Report, Site 54/TPA Site 9r—Tract A House 102, St. Paul Island, Alaska*. September 3.

For the National Oceanic and Atmospheric Administration

10/11/04

John Lindsay
NOAA, Pribilof Project Office

Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at House 102, TPA Site 9r/Site 54, St. Paul Island, Alaska, in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

Nov 1, 2004

Date

Tables and Figures

Table 1. Petroleum Hydrocarbon and Lead Analytical Data Summary for Confirmation Samples, House 102, TPA Site 9r/Site 54, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
Site 54/TPA Site 9r Confirmation Samples									
SP54-CS-001-100	10	0.04 U	0.04 U	0.04 U	0.04 U	2 U	10 U	50 U	2.12
SP54-CS-001-250[a]	10	0.02 U	0.02 U	0.02 U	0.02 U	1 U	10 U	50 U	1.55
SP54-CS-002-030	3	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U	ND
SP54-CS-003-030	3	0.03 U	0.05	0.03 U	0.06	2 U	230	50 U	39.8
SP54-CS-004-100	10	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U	0.83 U
SP54-CS-005-100	10	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U	2.34
SP54-CS-006-030	3	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U	6.95
SP54-CS-007-180	18	0.10 U	0.10 U	0.10 U	0.10 U	5 U	**7,300**	430	1.47
SP54-CS-007-250[b]	18	0.10 U	0.10 U	0.10 U	0.10 U	5 U	**8,300**	480	0.79 U
SP54-CS-008-180	18	0.06 U	0.06 U	0.06 U	0.06 U	3 U	**4,900**	260	1.38
SP54-CS-008-250[c]	18	0.07 U	0.07 U	0.07 U	0.07 U	4 U	**5,200**	290	1.39
Site 54/TPA Site 9r Stockpile Samples									
SP22-SS-901	1.5	0.02	0.02	0.02 U	0.03	1 U	80	91	39.3
SP22-SS-902	1.5	0.03 U	0.03 U	0.03 U	0.04	2 U	110	77	46.0
SP22-SS-903	1.5	0.02 U	0.02	0.02 U	0.04	1 U	**350**	75	45.4
SP22-SS-904	1.5	0.02 U	0.04	0.02 U	0.07	1 U	250	69	62.4
SP22-SS-905	1.5	0.02 U	0.02 U	0.02 U	0.03	1	140	79	43.7
SP22-SS-906	1.5	0.02 U	0.02	0.02 U	0.03	1 U	10 U	77	21.7
Trip Blank Sample									
Trip blank	--	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
ADEC Method Two Cleanup Level[d]		*0.02*	*5.4*	*5.5*	*78*	*300*	*250*	*10,000*	*400*
Alternative Cleanup Level[e]		*0.5*[f]	*5.4*	*NA*	*NA*	*1,400*[g]	*2,500*	*NA*	

Notes

bold Indicates concentration above one or both cleanup levels. Although reporting limits for benzene sometimes exceeded the ADEC Method Two cleanup level of 0.02 mg/kg, all reporting limits were below the alternative cleanup level of 0.5 mg/kg.

ADEC Alaska Department of Environmental Conservation
bgs Below ground surface
BTEX Benzene, toluene, ethylbenzene, and total xylenes
DRO Diesel-range organic compounds
GROs Gasoline-range organic compounds
mg/kg Milligram per kilogram
-- Not analyzed
NA Not available
PAH Polynuclear aromatic hydrocarbon
RRO Residual-range organic compounds
TPA Two-Party Agreement
U The analyte was analyzed for, but not detected above the sample reporting limit
a Duplicate of sample number SP54-CS-001-100.

b Duplicate of sample number SP54-CS-007-180.

c Duplicate of sample number SP54-CS-008-180.

d Cleanup level is from Title 18 of the *Alaska Administrative Code* 75, "Oil and Hazardous Substances Pollution Control" regulations, published by the State of Alaska and amended through October 28, 2000. Contaminants of concern for this site are limited to BTEX, GRO, DRO, RRO, and select PAHs; although not identified as a contaminant of concern in the corrective action plan, lead is included because lead analyses were conducted on some samples.

e Cleanup level obtained from ADEC Method Two based on the "Ten Times Rule" applied to the migration to groundwater pathway, as discussed in Section 5.0 of the corrective action plan (NOAA 2003a).

f Under the TPA, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg).

g Cleanup level selected is based on more stringent value associated with ingestion and inhalation pathways.

Table 2. Polynuclear Aromatic Hydrocarbon Analytical Data Summary for Confirmation Samples, House 102, TPA Site 9r/Site 54, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Naphtha-lene (mg/kg)	Acenaph-thylene (mg/kg)	Acenaph-thene (mg/kg)	Fluorene (mg/kg)	Phenan-threne (mg/kg)	Anthracene (mg/kg)	Fluoran-thene (mg/kg)	Pyrene (mg/kg)	Benz(a) anthracene (mg/kg)	Chrysene (mg/kg)	Benzo(b) fluoran-thene (mg/kg)	Benzo(k) fluoran-thene (mg/kg)	Benzo(a) pyrene (mg/kg)
Site 54/TPA Site 9r Confirmation Samples														
SP54-CS-001-100	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP54-CS-001-250[a]	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP54-CS-002-030	3	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP54-CS-003-030	3	0.018	0.005 U	0.005 U	0.005 U	0.013	0.005 U	0.011	0.016	0.005 U	0.006	0.008	0.005 U	0.005 U
SP54-CS-004-100	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP54-CS-005-100	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP54-CS-006-030	3	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP54-CS-007-180	18	0.050 U	0.050 U	0.050 U	1.700	2.100	0.050 U	0.050 U	0.160	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP54-CS-007-250[b]	18	0.050 U	0.050 U	0.050 U	1.600	2.400	0.050 U	0.050 U	0.180	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP54-CS-008-180	18	0.050 U	0.050 U	0.050 U	0.270	0.050 U	0.050 U	0.050 U	0.075	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP54-CS-008-250[c]	18	0.050 U	0.050 U	0.050 U	0.280	0.050 U	0.050 U	0.050 U	0.110	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Site 54/TPA Site 9r Stockpil Samples														
SP22-SS-901	1.5	0.02 J	0.01 U	0.01 U	0.01 U	0.04 J	0.01	0.04 J	0.04 J	0.02 J	0.02 J	0.02	0.01	0.02
SP22-SS-902	1.5	0.01	0.01 U	0.01 U	0.01 U	0.02	0.01 U	0.02	0.02	0.01	0.01	0.02	0.01 U	0.02
SP22-SS-903	1.5	0.07	0.01 U	0.01 U	0.01 U	0.02	0.01 U	0.01	0.02	0.01 U	0.01	0.01	0.01 U	0.01
SP22-SS-904	1.5	0.01	0.01 U	0.01 U	0.01 U	0.01	0.01 U	0.01	0.02	0.01	0.01	0.01	0.01 U	0.01
SP22-SS-905	1.5	0.03	0.01 U	0.01 U	0.01 U	0.02	0.01 U	0.01	0.02	0.01 U	0.01	0.01	0.01 U	0.01
SP22-SS-906	1.5	0.01	0.01 U	0.01 U	0.01 U	0.02	0.01 U	0.02	0.02	0.01	0.01	0.01	0.01 U	0.01
ADEC Method Two Cleanup Level[d]		*43*	*NA*	*210*	*270*	*NA*	*4,300*	*NA*	*1,500*	*6*	*620*	*11*	*110*	*1*

Notes

ADEC	Alaska Department of Environmental Conservation
bgs	Below ground surface
mg/kg	Milligram per kilogram
NA	Not available
TPA	Two-Party Agreement
U	The analyte was analyzed for, but not detected above the sample reporting limit
J	Analyte was positively identified, but numerical value is estimated concentration; result is considered qualitively acceptable, but quantitatively unreliable
a	Duplicate of sample number SP54-CS-001-100.
b	Duplicate of sample number SP54-CS-007-180.
c	Duplicate of sample number SP54-CS-008-180.
d	Cleanup level is from Title 18 of the *Alaska Administrative Code* 75, “Oil and Hazardous Substances Pollution Control” regulations, published by the State of Alaska and amended through October 28, 2000.

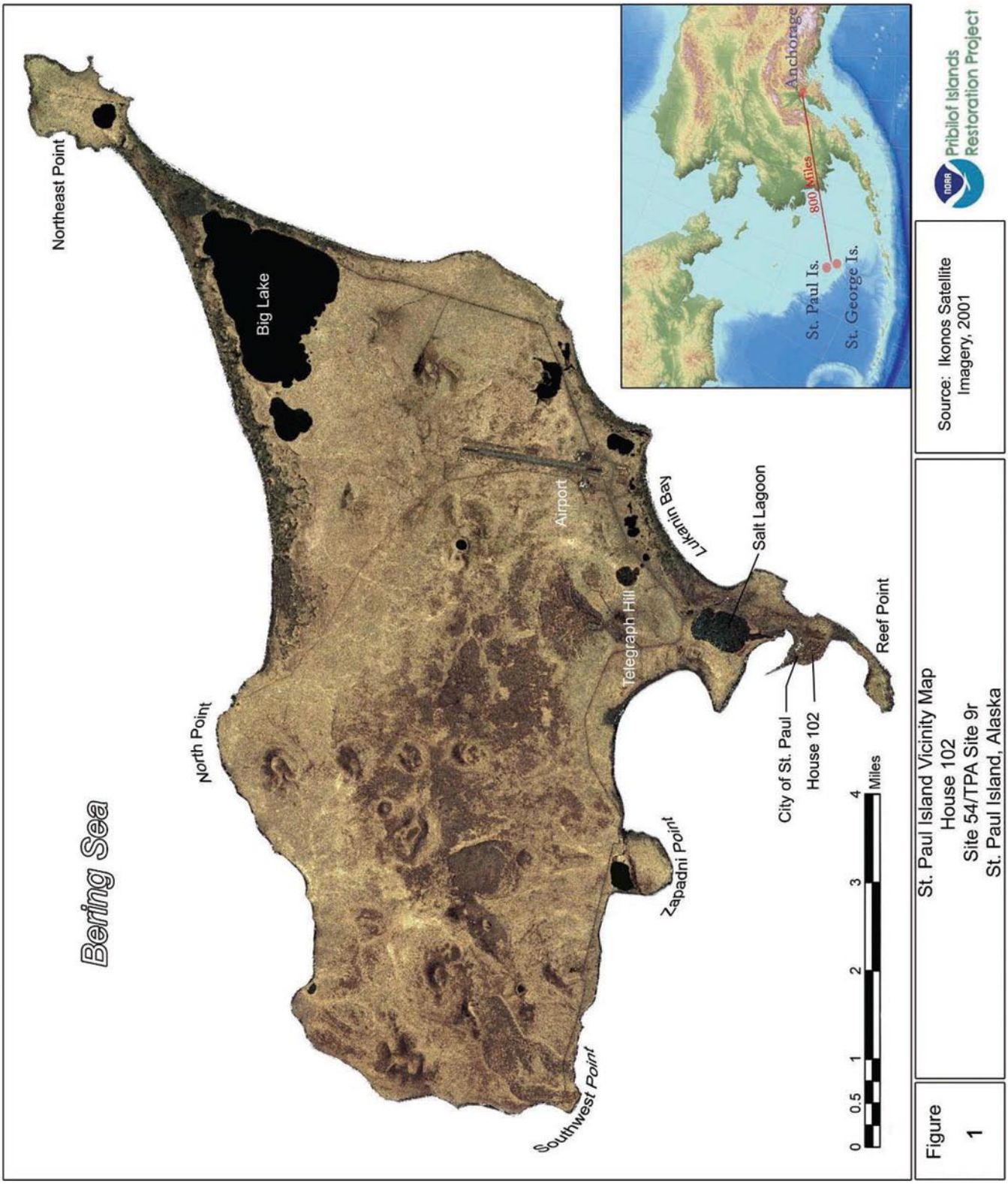

Bering Sea
Northeast Point
Big Lake
North Point
Airport
Telegraph Hill
Lukanin Bay
Salt Lagoon
Reef Point
City of St. Paul
House 102
Zapadni Point
Southwest Point
0 0.5 1 2 3 4 Miles
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Source: Ikonos Satellite Imagery, 2001
Pribilof Islands Restoration Project
Figure 1
St. Paul Island Vicinity Map
House 102
Site 54/TPA Site 9r
St. Paul Island, Alaska

Figure 2	Legal Property Description Map House 102 UST NOAA Site 54/TPA Site 9r St. Paul Island, Alaska	Sources: BLM Tracts (BLM MTPs 1983), TPA 9r Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

Figure 3	Groundwater Sampling Results House 102 NOAA Site 54/TPA Site 94 St. Paul Island, Alaska	Sources: Well locations and Excavation Extent (NOAA GPS 2002/2004), Aerial photo (Aeromap US 1996).

Pribilof Islands Restoration Project

Figure 4. Excavation at the House 102 underground storage tank site. An unidentified cement utility line discovered at approximately 3 feet below ground surface can be seen along the boundary of the excavation.

Figure 5. The underground storage tank removed from House 102.

Figure 6. The new aboveground storage tank installed to replace the removed underground storage tank.

NOAA Site 55
TPA Site 9s: Tract A Lot 103

Request for NFRAP, House 103, TPA Site 9s/Site 55
St. Paul Island, Alaska 1297

Letter from Louis Howard to John Lindsay RE: Request for No Further Remedial Action Planned Determination Rescinded House 103 TPA 9S Site 55, St. Paul Island. Dated December 2, 2005.....1307

Letter from Louis Howard to John Lindsay RE: Review and Approval of *Corrective Action Plan for the Removal of Lead Contaminated Soil at Teacher Houses 101 and 103, and the Duplex, Lead Contaminated Soils Site (NOAA Site 60, Non-TPA)*, St. Paul Island, Alaska, dated May 15, 2006. Dated May 15, 2006.....1309

Request for NFRAP
House 103, TPA Site 9s/Site 55
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site: House 103, also known as Two Party Agreement (TPA) Site 9s and National Oceanic and Atmospheric Administration (NOAA) Site 55, and Tract A Lot 103.

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. On the island, House 103 is located on the southeast portion of Village Hill along Gorbatch Street in the City of St. Paul, near City Hall (170° 16' 54.53" W longitude, 57° 7' 14.17" N latitude; Figure 1).

Legal Property Description: The location of House 103 and the previously associated underground storage tank (UST) is Lot 3, Block 9, U.S. Survey No. 4943, Alaska, Tract "A", St. Paul Townsite, accepted by the Bureau of Land Management August 2, 1968 (Figure 2). The federal government currently owns the associated surface and subsurface estate.

Type of Release: Potential sources and release mechanisms include: 1) diesel fuel spills occurring during UST fueling; and 2) diesel fuel leaks occurring from the UST or its associated piping.

History and Background:
The 1940s era house served as quarters for government employees, although in subsequent years it was occupied by island school teachers. Sometime after 1987, island entities assumed beneficial rights to the house and rented it to various individuals. An UST was installed on House 103 property to store heating oil for the home. NOAA proposed to remove the UST in anticipation of the transfer of the real property under the Transfer of Property Agreement (TOPA; NOAA 1984) to Aleut Native American entities. NOAA prepared a corrective action plan (CAP; NOAA 2002) for the removal of the UST at House 103, implemented it in October 2002, and provided a corrective action report (CAR; NOAA 2004).

Summary of Site Investigations:
House 103 was only recently identified as a site of concern under Public Law 104-91. Therefore, no previous soil samples were collected at the House 103 property.

Groundwater flow has not been well described for this site. Several groundwater monitoring wells are in the general vicinity of House 103. NOAA contractors conducted quarterly groundwater monitoring from September 2000 to September 2001 at wells MWA-4 and MWA-6 (Figure 3). Low levels of diesel-range organic compounds (DRO) well below the Table C cleanup level of 1500 µg/L were detected in both wells (IT Alaska Inc. 2002). Contractors also conducted quarterly groundwater monitoring from October 2003 to July 2004, sampling wells MWA-4, MWA-6, MWA-7, and MWA-8 (Figure 3). Data is currently available from the first three quarters. Petroleum constituents were not detected in MWA-4 or MWA-6. Low levels of DRO were detected in MWA-7 and MWA-8. A full report on 2003-2004 sampling events will be available late in 2004.

Summary of Applicable Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2000). Under the TPA, for benzene NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). ADEC uses 15 feet below ground surface (bgs) to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2000; 18 AAC 75.340 (j)(2)). Therefore, NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 feet to address the inhalation and ingestion pathways. Cleanup criteria were applied to the maximum extent practicable (18 AAC 75.325 (f), 18 AAC 75.990).

Summary of Clean up Actions:
Excavation activities began on October 24, 2002 by NOAA contractor, Bering Sea Eccotech, Inc. (BSE). Contaminated soils were removed by an excavator (Figure 4), loaded on dump trucks, and hauled to the petroleum-contaminated stockpile at the Blubber Dump. The contaminated soils were eventually treated in an enhanced thermal conduction system and disposed of at the local landfill (BSE 2003). After the UST was exposed, approximately 900 gallons of diesel fuel were pumped out from it prior to its removal (Figure 5). The fuel was donated to community members of the City of St. Paul. On October 26, 2002, the UST was removed from the ground, placed directly on a flat bed truck and transported to BSE's garage facility at the St. Paul airport (Figure 6).

Following tank removal, the excavation was increased to a depth of 17 feet bgs. Excavation to greater depths was not feasible with available on-site equipment. A total of 80 cubic yards (yd^3) of soil was removed from the UST excavation. The UST excavation was backfilled with clean fill material obtained from the scoria quarry at Telegraph Hill on St. Paul Island (Figure 7). The fill was placed in the excavation in 6- to 8-inch lifts and compacted with the excavator bucket. The site was restored to grade.

Prior to backfilling the excavation, seven confirmation samples were collected to confirm the condition of remaining in-place soils (Tables 1 and 2, Figure 8). Residual-range organic compounds (RRO) were the only compounds detected (50.1 mg/kg RRO; sample SNPTA103SS05) in the confirmation samples, and the concentration of RRO was well below the Method Two cleanup level. Gasoline range organics (GRO), benzene, toluene, ethylbenzene, and xylene (BTEX), DRO, and polynuclear aromatic hydrocarbons (PAHs) were not detected in any of the samples collected from the excavation.

The removed UST was cleaned with soap and water and cut into manageable pieces for recycling off-island. In accordance with Section 6.2.6 in the CAP (NOAA 2002), the rinsate generated during UST cleaning was transported to the Blubber Dump PCS stockpile and discharged onto the stockpile and ultimately treated.

In summary, the source of the contamination has been successfully removed (*i.e.*, 1,000-gallon UST) from the House 103 site. All accessible contaminated soils associated with the UST have been removed from the site and successfully treated and ultimately disposed of at the Tract 42 landfill.

Recommend Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action at House 103, TPA Site 9s/Site 55 in accordance with the Agreement and that ADEC requires no further remedial action plan from NOAA.

References
Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Contaminated Sites Program*. July 17, 1991.

ADEC. 2000. Title 18 of the Alaska Administrative Code 75, Articles 3 and 9. *Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. Amended through October 28, 2000.

Bering Sea Eccotech, Inc. 2003. *Enhanced Thermal Conduction Yearly Report, St. Paul Island, Initial Draft*. February.

IT Alaska Corporation. 2002. Draft Annual Groundwater Monitoring Report 2001, St. Paul Island, Alaska. March.

National Oceanic and Atmospheric Administration (NOAA). 1984. Transfer of Property Agreement.

NOAA. 1996. *Pribilof Islands Environmental Restoration Two-Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26.

NOAA. 2002. *Corrective Action Plan, UST Removals, Selected U.S. Government Sites*, St Paul Island, Alaska. August 13.

NOAA. 2004. *UST Removal and Corrective Action Report TPA Site 9-S – House 103 St. Paul Island, Alaska*. February 9.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

9/30/04
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at House 103, TPA Site 9s/Site 55 in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

10/11/04
Date

Tables and Figures

Table 1. Petroleum Hydrocarbon Analytical Data (mg/kg) Summary for Confirmation Samples, House 103, TPA Site 9s/Site 55, St. Paul Island, Alaska

Sample#	Sample Depth (feet)	GRO (AK101)	Benzene (EPA 8021B)	Toluene (EPA 8021B)	Ethylbenzene (EPA 8021B)	Total Xylene (EPA 8021B)	DRO (AK102)	RRO (AK103)
SNPTA103SS01	10	ND(8.91)	ND(0.0445)	ND(0.178)	ND(0.178)	ND(0.178)	ND(26.8)	ND(26.8)
SNPTA103SS02	7	ND(10.7)	ND(0.0533)	ND(0.213)	ND(0.213)	ND(0.213)	ND(28.8)	ND(28.8)
SNPTA103SS03	6.5	ND(6.35)	ND(0.0317)	ND(0.127)	ND(0.127)	ND(0.127)	ND(27.7)	ND(27.7)
SNPTA103SS04	6.5	ND(5.89)	ND(0.0295)	ND(0.118)	ND(0.118)	ND(0.118)	ND(27.6)	ND(27.6)
SNPTA103SS05	7	ND(5.39)	ND(0.0269)	ND(0.108)	ND(0.108)	ND(0.108)	ND(25.6)	50.1
SNPTA103SS06	9	ND(7.50)	ND(0.0375)	ND(0.150)	ND(0.150)	ND(0.150)	ND(25.1)	ND(25.1)
SNPTA103SS07	7	ND(7.05)	ND(0.0352)	ND(0.141)	ND(0.141)	ND(0.141)	ND(24.7)	ND(24.7)

NOTES:
1. ND = non-detect. The number provided in parentheses is the practical quantitation limit (PQL).
2. mg/Kg = milligrams per kilogram.

Table 2. Polynuclear Aromatic Hydrocarbon Analytical Data (mg/kg) Summary for Confirmation Samples, House 103, TPA Site 9s/Site 55, St. Paul Island, Alaska

Sample#	Sample Depth (feet)	Benzo(a) Anthracene	Benzo[a] pyrene	Benzo[b] Fluoranthene	Benzo[k] fluoranthene	Chrysene	Dibenzo [a,h] anthracene	Fluorene	Indeno[1,2,3-c,d] pyrene	Naphthalene
SNPTA103SS01	10	ND(0.670)	ND(0.670)	ND(0.670)	ND(1.34)	ND(0.670)	ND(0.938)	ND(0.670)	ND(0.670)	ND(0.938)
SNPTA103SS02	7	ND(0.719)	ND(0.719)	ND(0.719)	ND(1.44)	ND(0.719)	ND(1.01)	ND(0.719)	ND(0.719)	ND(1.01)
SNPTA103SS03	6.5	ND(0.692)	ND(0.692)	ND(0.692)	ND(1.38)	ND(0.692)	ND(0.968)	ND(0.692)	ND(0.692)	ND(0.968)
SNPTA103SS04	6.5	ND(0.689)	ND(0.689)	ND(0.689)	ND(1.38)	ND(0.689)	ND(0.964)	ND(0.689)	ND(0.689)	ND(0.964)
SNPTA103SS05	7	ND(0.638)	ND(0.638)	ND(0.638)	ND(1.28)	ND(0.638)	ND(0.893)	ND(0.638)	ND(0.638)	ND(0.893)
SNPTA103SS06	9	ND(0.629)	ND(0.629)	ND(0.629)	ND(1.26)	ND(0.629)	ND(0.880)	ND(0.629)	ND(0.629)	ND(0.880)
SNPTA103SS07	7	ND(0.617)	ND(0.617)	ND(0.617)	ND(1.23)	ND(0.617)	ND(0.864)	ND(0.617)	ND(0.617)	ND(0.864)

NOTES:

1. ND=non-detect. The number provided in parentheses is the practical quantitation limit (PQL).
2. mg/kg = milligrams per kilogram.
3. Shading indicates instances when PQL is higher than applicable regulatory limits.

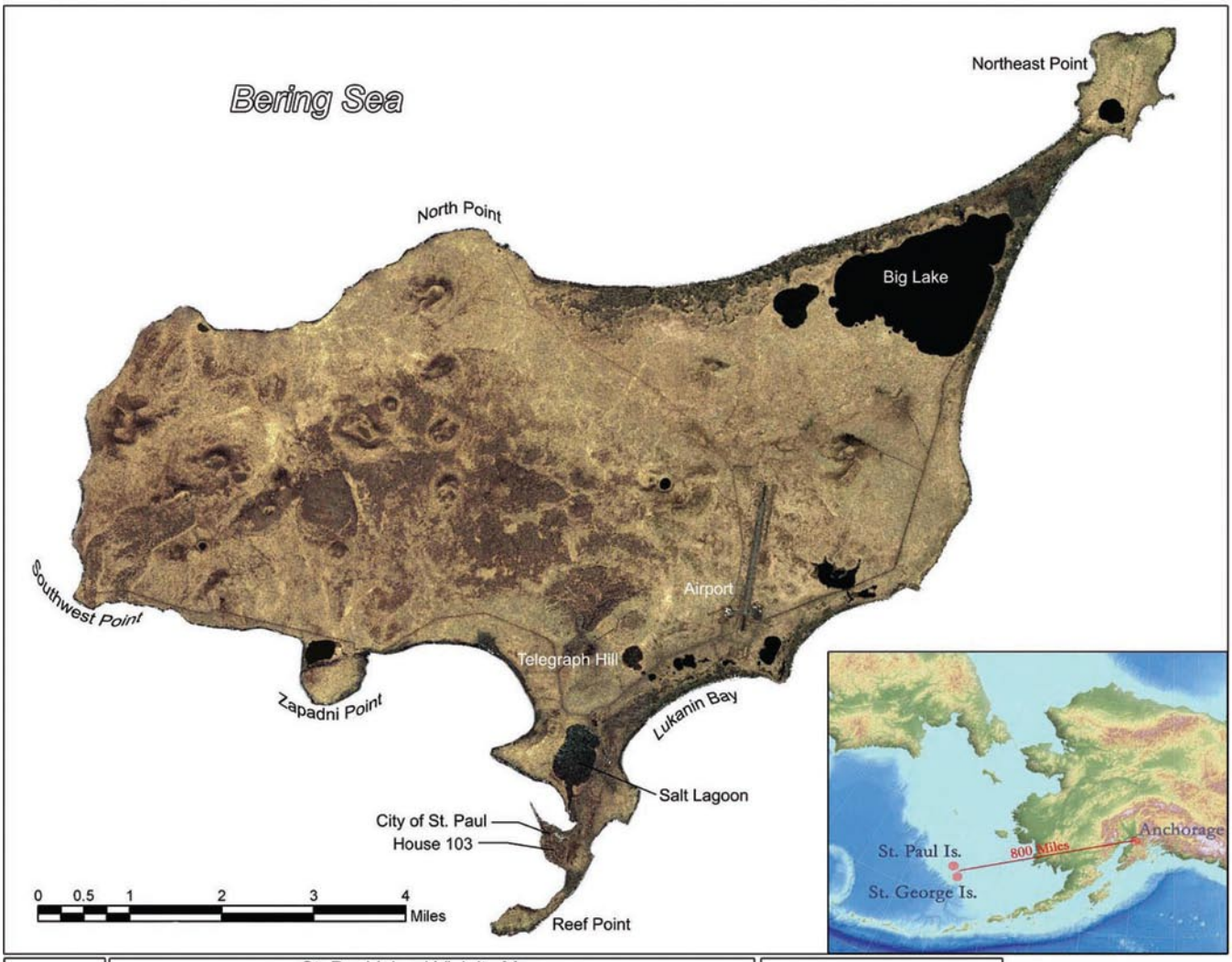


Figure 1	St. Paul Island Vicinity Map Location of House 103 NOAA Site 55/TPA Site 9s St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001	Pribilof Islands Restoration Project

Figure 2	Legal Property Description Map House 103 UST NOAA Site 55/TPA Site 9s St. Paul Island, Alaska	Sources: BLM Tracts (BLM MTPs 1983), TPA 9s Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

Figure 3	Groundwater Sampling Results House 103 UST NOAA Site 55/TPA Site 9s St. Paul Island, Alaska	Sources: Well locations and Excavation Extent (NOAA GPS 2002/2004), Aerial photo (Aeromap US 1996).	Pribilof Islands Restoration Project

Figure 4. Excavation around the UST and utility lines.

Figure 5. Transfer of fuel from the UST to a portable storage tank.

Figure 6. UST on flatbed truck for transport to POSS Camp

Figure 7. Clean fill material placed in excavation

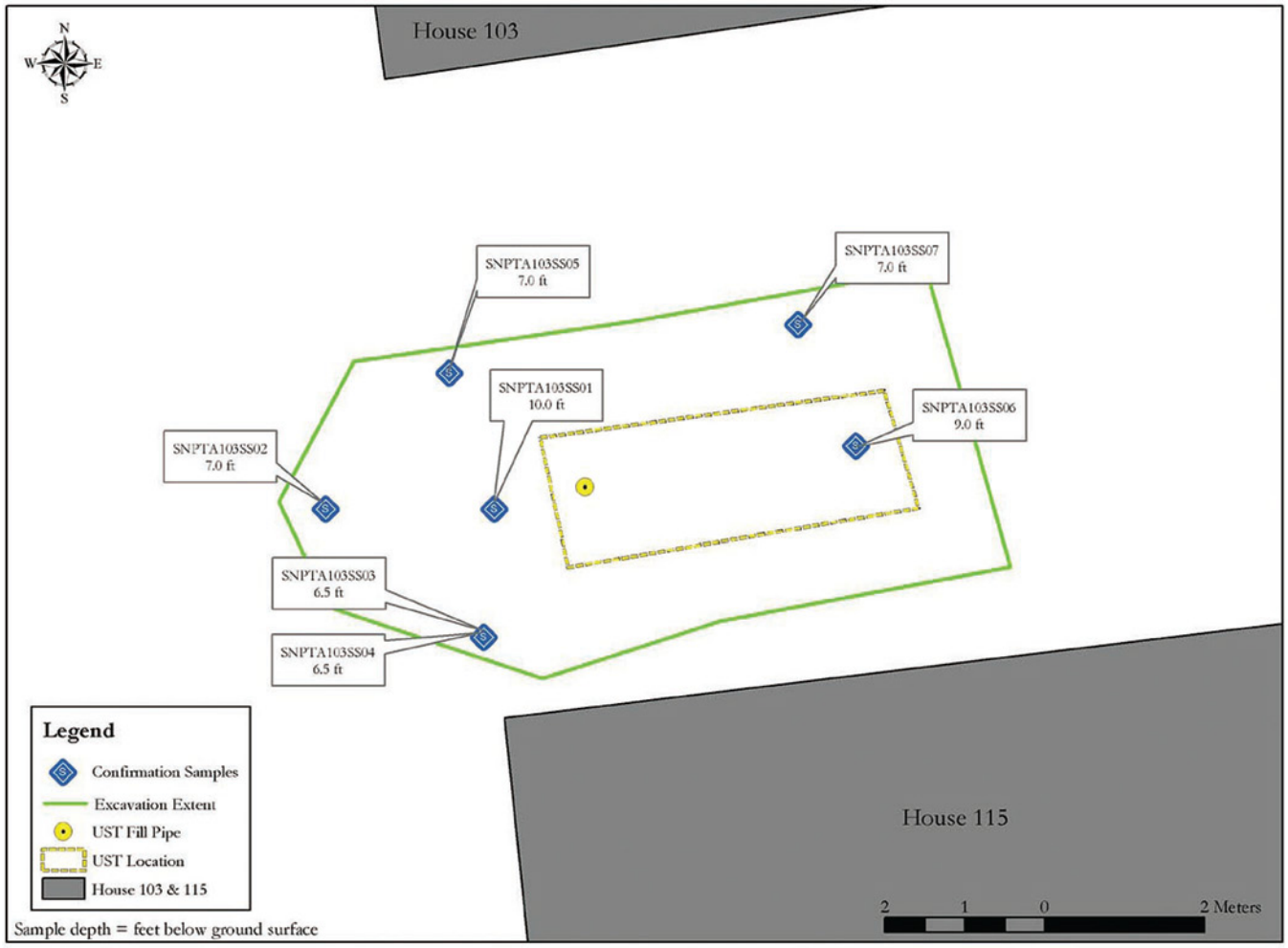


Figure 8	Site Excavation Map House 103 NOAA Site 55/TPA Site 9s St. Paul Island, Alaska	Source: NOAA Pribilof Project GIS, 2002.	Pribilof Islands Restoration Project

FRANK H. MURKOWSKI, GOVERNOR
555 Cordova Street
Anchorage, AK 99501
PHONE: (907) 269-7552
FAX: (907) 269-7649
http://www.dec.state.ak.us

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

File No.: 2644.38.023.19

December 2, 2005

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-0070

RE: Request for No Further Remedial Action Planned Determination Rescinded House 103 TPA 9S Site 55, St. Paul Island

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (ADEC) received a request for no further action at TPA 9S (Site 55) with documentation on October 8, 2004, for review and comment. ADEC granted a No Further Remedial Action Planned (NFRAP) determination based on its review. Due to The November 15, 2005, LBP – Risk Assessment and Asbestos Air Monitoring Report which identified lead contaminated soil from 1,200 mg/kg (SP-103-S4) to 3,800 mg/kg (SP-103-S2), ADEC is exercising its rights under A.S. 46.03, 18 AAC 75, to require NOAA to conduct additional site assessment, remediation, and/or other necessary actions deemed appropriate by ADEC.

The unrestricted use or residential cleanup level for lead in soil is 400 mg/kg which is being exceeded at the site. The October 2004 TPA 9S (Site 55) NFRAP determination is formally rescinded and ADEC is requiring NOAA to submit a corrective action plan for review and comment.

Please contact me with any questions or concerns directly at (907) 269-7552.

Sincerely,

Louis Howard

Louis Howard
Project Manager
Federal Facilities Section

RECEIVED
DEC 0 5 2005

G:\SPAR\SPAR-CS\38 Case Files (Contaminated Sites)\2644 St. Paul Island\2644.38.023.19 TPA 09S Tract A Lot 103\02-DEC-2005 St. Paul House 103 TPA 9S NFRAP rescinded.doc

1200-01-C.2.a-0981

4975

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office
7600 Sand Point Way N.E
Seattle, Washington 98115
Ph 206-526-6965, fax 206-526-4819

May 15, 2006

Mr. Louis Howard
Project Manager
Alaska Department of Environmental Conservation
Division of Spill Prevention and Response
Contaminated Sites Program
555 Cordova Street
Anchorage, AK 99501-2617

Subject: Review and Approval of *Corrective Action Plan for the Removal of Lead Contaminated Soil at Teacher Houses 101 and 103, and the Duplex, Lead Contaminated Soils Site (NOAA Site 60, Non-TPA)*, St. Paul Island, Alaska, dated May 15, 2006

Dear Mr. Howard:

Attached please find two hard copies and one CD containing a copy of the corrective action plan (CAP). NOAA requests your review at the earliest possible time. NOAA will finalize this CAP when in receipt of your approval.

The site within the scope of this CAP is located at three residential buildings in St. Paul village. Teacher Houses 101 and 103 reside on Village Hill, east of the City of St. Paul administrative building while the Duplex is located east of the Headstart Building. NOAA removed underground storage tanks (USTs) and petroleum contaminated soil (PCS) to the extent practicable from these locations in 2002 and 2003 as the corrective actions for NOAA Sites 24, 53, and 55. NOAA received conditional closure status from ADEC for these three UST/PCS sites in 2004 and 2005.

NOAA identified lead contamination in surface and near-surface soil along the buldings' drip lines during environmental due diligence activities associated with property transfer. NOAA suspects peeling lead-based paint (LBP) from these structures as the lead soil contamination source. Consistent with our recent discussions, NOAA Site 60 includes the lead contaminated soil at these buildings.

NOAA will characterize surface and near-surface soil along the buildings' drip lines for lead. NOAA will remove lead contaminated soil greater than the State of Alaska residential cleanup

level of 400 milligrams per kilogram, to a maximum depth of two feet below ground surface. Lead contamination deeper than two feet will not be removed, but its presence will be delineated using a visible marker such as perforated plastic, prior to backfilling lead soil excavations with clean scoria. The corrective action will involve disposing of lead contaminated soil off-island if designated a characteristic hazardous waste, or on-island by landfilling in NOAA's Tract 42 if not designated a hazardous waste. NOAA anticipates completing the corrective action at this site during the 2006 field season.

If you have any questions, please do not hesitate to contact me either in writing, or at (206) 526-4560.

Sincerely,

John A. Lindsay, Manager
Pribilof Project Office

Enclosures

cc: St. Paul RAB Members (CD only)
Leslie Simmons, ADEC
NOAA Administrative Record

NOAA and ADEC agreed that lead contaminated soil around the building drip line at this location would be addressed by NOAA Site 60 / NTPA: Lead Contaminated Soils. Accordingly, NOAA Site 55 / TPA Site 9r has retained its conditional closure status.

NOAA Site 56
TPA Site NTPA: ATCO/Radio Bldg
Barrel Staging Area

See site 48

NOAA Site 57
TPA Site NTPA: Tract 46 Sheet Metal Garage

This site was created as an administrative convenience for NOAA and does not have TPA-related issues, thus closure was not required.

NOAA Site 58
NTPA: Tract 50 Foundation DRO, Combine Shop UST

Request for Conditional Closure Combine Shop, NOAA Tract 50, St. Paul Island, Alaska 1321

Request for Conditional Closure Tract 50 Drum Platform Foundation Site NOAA Site 58, St. Paul Island, Alaska 1335

Request for Conditional Closure
Combine Shop, NOAA Tract 50
St. Paul Island, Alaska

Request for Conditional Closure

Site:
The site is known as the Combine Shop, as well as the National Oceanic and Atmospheric Administration (NOAA) Combine Shop. The site herein will be called "the site." The site is not included on the list commonly referred as Two-Party Agreement (TPA) or non-TPA (NTPA) sites. However, for consistency NOAA is addressing the site in compliance with the TPA.

Location:
St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea (Figure 1). On the island, the site is at NOAA Tract 50, along the Salt Lagoon Channel between NOAA Staff Quarters and the NOAA GARCO storage garage (57°07'41.67" North Latitude, 170°16'32.58" West Longitude; Figure 2).

Legal Property Description:
The site is located within NOAA Tract 50 (Figure 2). The legal description for Tract 50 is: Township 35 South, Range 132 West, Section 25 of the Seward Meridian, Alaska, as shown on the plat of rectangular survey, officially filed April 18, 1997. The U.S. Government owns the surface and subsurface estate of Tract 50. Most of Tract 50, including the site, is scheduled for transfer to Tanadgusix Corporation (TDX) under the Transfer of Property Agreement (TOPA; NOAA 1984).

Type of Release:
The site used an underground storage tank (UST) to store heating oil used to fire a furnace to heat the Combine Shop building. Arctic-grade diesel is the assumed type of heating oil stored in the UST, with specific contaminants of concern limited to gasoline-range organics (GRO); diesel-range organics (DRO); residual-range organics (RRO); benzene, toluene, ethylbenzene, and total xylenes (BTEX); and select polynuclear aromatic hydrocarbons (PAHs). Releases from the UST are presumed limited to overfilling the tank based on observations made during UST removal as well as confirmation sample analyses (see "Summary of Corrective Actions" below). Subsequent to UST removal, an aboveground storage tank (AST) was installed at the site by a third party to supply heating oil to the building's furnace. No other release of contaminants has been documented at the site.

History and Background:
NOAA constructed the Combine Shop building, reportedly in 1974 (CESI 2001). The building is constructed with a steel frame atop a concrete slab, with corrugated steel siding and roof panels on the exterior, and plywood walls and ceilings on the interior. The metal surfaces are reportedly unpainted, with some of the interior plywood walls having a thin coat of beige paint (CESI 2001). The building has been used for several purposes: (1) storage in the main room area; (2) storage on shelving in the loft area; (3) two bathrooms on the ground floor; (4) a boiler room on the ground floor; (5) garage on the south side of the main floor; and (6) a wood shop on the north side of the main floor.

Recent building use included storing the island's volunteer fire department's fire trucks and appurtenances. Current uses include the Tribal Governments cardboard and aluminum can recycling center, and the storing of animal carcasses and skins.

Summary of Site Investigations:
In August 2000, NOAA contractor Columbia Environmental Sciences, Inc. (CESI) identified one UST at the site. CESI also identified a "modern" power transformer with no evidence of dielectric oil releases.

NOAA did not install any groundwater monitoring wells at the site. The site is approximately 400 feet south of the Diesel Seep Site (NOAA Sites 33 and 34/TPA Sites 13a and 13b), where NOAA previously installed monitoring wells at five locations (MWDS-1 through MWDS-5). Since both the Diesel Seep Site and the site are located along the Salt Lagoon Channel, it is assumed their vadose zone and upper saturated zone soil types are similar as their geologic histories are likely to be similar. Well logs for these wells suggest the vadose zone and upper saturated zone soils at and near the site building consist of a thin surface layer of imported scoriaceous rock for a heavy equipment driving surface, followed by coarse-grained sand with fines through the vadose zone and into the upper saturated zone (ADNR 2005).

Summary of Applied Closure Standards:
NOAA employed ADEC Method One cleanup criteria for GRO, DRO, and RRO in soil, as discussed at 18 Alaska Administrative Code (AAC) Chapter 75.341(a), and ADEC Method Two cleanup criteria for BTEX and select PAHs as discussed at 18 AAC 75.341(c) (ADEC 2003a). NOAA calculated a Method One matrix score to determine the site's cleanup levels for GRO, DRO, and RRO (18 AAC 75.341(a)). A copy of the calculation is attached to this conditional closure request. According to 18 AAC 75.340(d), "the soil cleanup levels provided under method one and method two apply at a contaminated site unless the department approves an alternative cleanup level that the responsible person has proposed under method three or method four." When using Method One for GRO, DRO, and RRO soil cleanup levels, 18 AAC 75.341(a)(4) indicates the site must meet the most stringent standards for benzene, toluene, ethylbenzene, and total xylenes for the applicable exposure pathway in ADEC's Method Two cleanup level table. The site-specific cleanup levels are summarized in Table 1 of this conditional closure request.

Summary of Corrective and Closure Actions:
NOAA tasked CESI with removing the UST and its appurtenances from the site, as well as any PCS. CESI removed the UST and appurtenances on August 24, 2000. CESI observed the tank in good condition, with minimal corrosion and no holes. CESI observed visual and olfactory evidence of releases in shallow soils around the fill pipe, but did not observe evidence of releases in the deeper excavation soils (*i.e.*, to 6 ft bgs). Available documentation does not indicate the size of the UST, however, other NOAA sites on St. Paul Island normally used 1,000-gallon capacity USTs for heating oil storage. CESI inerted the UST then hauled it to a nearby metallic debris staging area. Nortech, another NOAA contractor, cut up the UST and appurtenances for scrap and transported the scrap off-island on NOAA's September 2000 debris barge (CESI 2001, Nortech 2001).

CESI removed an unspecified volume of PCS from the area surrounding the UST (Figure 3). The bottom of the excavation extended to the top of the saturated zone, approximately 6 ft bgs. Groundwater observed in the bottom of the excavation did not have a visible petroleum sheen (CESI 2001). CESI indicated the excavation's west sidewall was adjacent to the east wall of the Combine Shop building, and that further excavation to the west was not possible due to the excavation's close proximity to the building wall.

CESI collected five confirmation samples from the excavation: one sample from the bottom of the excavation and one sample from each of the four excavation sidewalls. All five confirmation samples were below their closure standards, as listed in the previous section (Figure 3, Table 1). One should note that CESI did not survey the locations of each confirmation sample location, so their locations as shown on Figure 3 are approximate and are based on CESI's report text (CESI 2001). One should also note the sample from the west sidewall, which is closest to the Combine Shop building, contained DRO at 340 mg/kg. This value is below the site cleanup level of 1,000 mg/kg, though it is above the ADEC Method Two DRO cleanup level of 250 mg/kg.

CESI hauled the removed PCS to NOAA's permitted PCS stockpile at the Blubber Dump, located approximately 1 mile northwest of the site. CESI collected a characterization sample to represent the PCS, with fixed laboratory results indicating the PCS did not exceed the site-specific cleanup levels though site contaminants DRO and RRO were detected in the sample. NOAA subsequently remediated the PCS using its Enhanced Thermal Conduction treatment system, with treated soil hauled to NOAA's Tract 42 for use as landfill day cover (NOAA 2005).

CESI backfilled the excavation and restored the site to the surrounding grade. An AST was installed in September 2000 to replace the removed UST. The AST was purportedly installed by a third party.

CESI advanced one soil boring immediately west of the Combine Shop building in October 2000 (Figure 3) to determine the potential migration of DRO and RRO associated with petroleum-contaminated soil (PCS) identified during removal of UST. CESI collected soil samples from three separate boring depth intervals: 0 to 2 feet (ft) below ground surface (bgs), 2 to 4 ft bgs, and 4 to 6 ft bgs. The 4 to 6 ft bgs sample represented soil at the bottom of the vadose zone and the top of the saturated ("groundwater") zone. CESI indicated the purpose of this boring was to collect soil samples at the water table to determine if the closest, downgradient (relative to assumed groundwater flow direction) soils were contaminated (CESI 2001). All three samples were analyzed on island using a colorimetric field screening technique (Dexil® Petroflag), with screening results indicating no petroleum contamination was present near State of Alaska Department of Environmental Conservation (ADEC) regulatory limits. CESI sent the 0 to 2 ft bgs and 4 to 6 ft bgs soil samples to an off-island laboratory for quantitative analysis using ADEC-approved methods. The laboratory determined these samples did not contain DRO or RRO above their ADEC Method One Category C cleanup levels or Method Two for BTEX and select PAHs.

Recommended Action:

Site confirmation results from the UST excavation indicate no contaminants of concern remain above their site cleanup levels. In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective and closure actions, to the maximum extent practicable, at the Combine Shop site, in accordance with the TPA and that ADEC grant a conditional closure that will not require further remedial action from NOAA. ADEC will/may require additional containment, investigation, or cleanup if subsequent information indicates that the level of contamination that remains does not protect human health, safety, or welfare, or the environment.

References:

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels*. Contaminated Sites Program. July 17.

ADEC. 2003a. Title 18 Alaska Administrative Code (AAC) Chapter 75, Articles 3 and 9. *Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. Amended through January 30.

ADEC. 2003b. 18 AAC 78. *Underground Storage Tanks*. State of Alaska. Amended through January 30.

Alaska Department of Natural Resources (ADNR). 2005. Well Log Tracking System (WELTS). Division of Mining, Land and Water, Alaska Hydrologic Survey. http://info.dec.state.ak.us/welts/default.asp . Database accessed October 31, 2005.

Columbia Environmental Sciences, Inc. (CESI). 2001. *Draft Building Assessment Report, Combine Shop, St. Paul Island, Alaska*. Version 2.0. May 29.

National Oceanic and Atmospheric Administration (NOAA). 1984. *Transfer of Property on the Pribilof Islands ("Transfer of Property Agreement (TOPA)")*. February 10.

NOAA. 1996. *Pribilof Islands Environmental Restoration Two-Party Agreement, Attorney General's Office File No. 66-1-95-0126*. January 26.

NOAA. 2005. *2002 Petroleum Contaminated Soil Remediation*. February.

Nortech. 2001. Scrap Recycle Receipt, Seattle Iron and Metal Corp. Receipt number 014854. November 8.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

16 Nov 2005
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed to the maximum extent practicable at the Combine Shop site at NOAA Tract 50 on St. Paul Island, in accordance with the Agreement and that no further remedial action is required as a part of this conditional closure granted by ADEC.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

Nov 39 2005
Date

TABLES

Table 1 – Summary of Site Soil Cleanup Levels

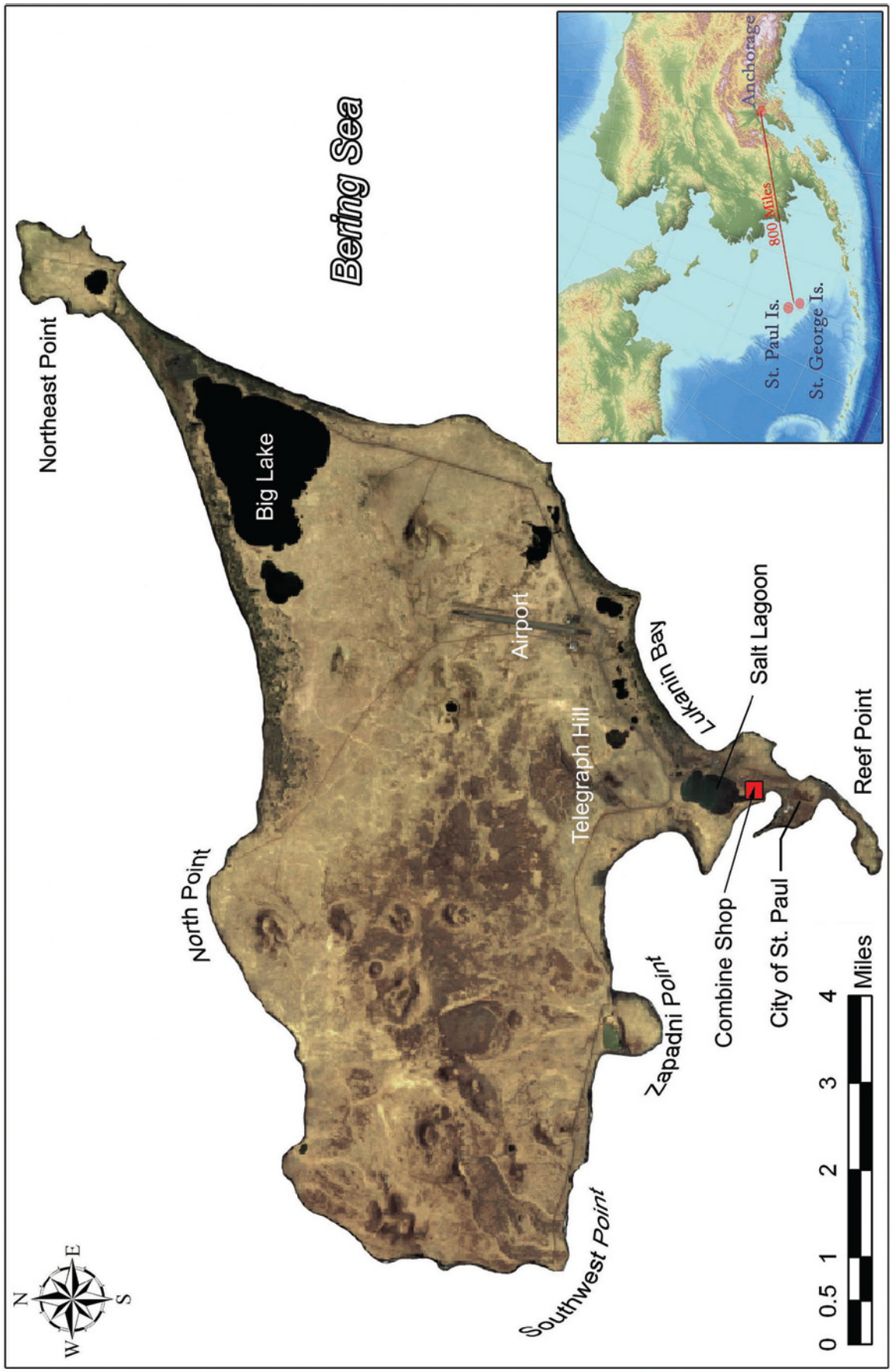
Analytical Parameter	Laboratory Method	Soil Cleanup Objective[a] (mg/kg)
GRO	AK101	500
DRO	AK102	1,000
RRO	AK103	2,000
Benzene	EPA 8021B	0.5 [b]
Ethylbenzene	EPA 8021B	5.5
Toluene	EPA 8021B	5.4
Xylenes, total	EPA 8021B	78
Acenaphthene	EPA 8270C	210
Anthracene	EPA 8270C	4,300
Benzo(a)anthracene	EPA 8270C	6
Benzo(b)fluoranthene	EPA 8270C	11
Benzo(k)fluoranthene	EPA 8270C	110
Benzo(a)pyrene	EPA 8270C	1
Chrysene	EPA 8270C	620
Dibenzo(a,h)anthracene	EPA 8270C	1
Fluorene	EPA 8270C	270
Indeno(1,2,3-c,d)pyrene	EPA 8270C	11
Naphthalene	EPA 8270C	21
Pyrene	EPA 8270C	1,500

Notes:

(a) Unless otherwise noted, the cleanup objective listed is the ADEC Method One cleanup level for GRO, DRO, and RRO, and the ADEC Method Two cleanup level for BTEX and select PAHs obtained from Title 18 of the *Alaska Administrative Code* 75, "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through January 30, 2003. Contaminants of concern for this site are limited to BTEX, GRO, DRO, RRO, and select PAHs; although not identified as a contaminant of concern in the corrective action plan, lead is included because lead analyses were conducted on some samples.

(b) Under the TPA, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg); however, NOAA has attempted to remove benzene to within the current ADEC Method Two cleanup level (0.02 mg/kg) when possible.

FIGURES



Source: Ikonos Satellite Imagery, 2001

Pribilof Islands Restoration Project

St. Paul Island Vicinity Map
Combine Shop Location
St. Paul Island, Alaska

Figure 1

Figure 2	NOAA Tract 50 Combine Shop Location St. Paul Island, Alaska	Sources: Tracts (BLM 1983), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

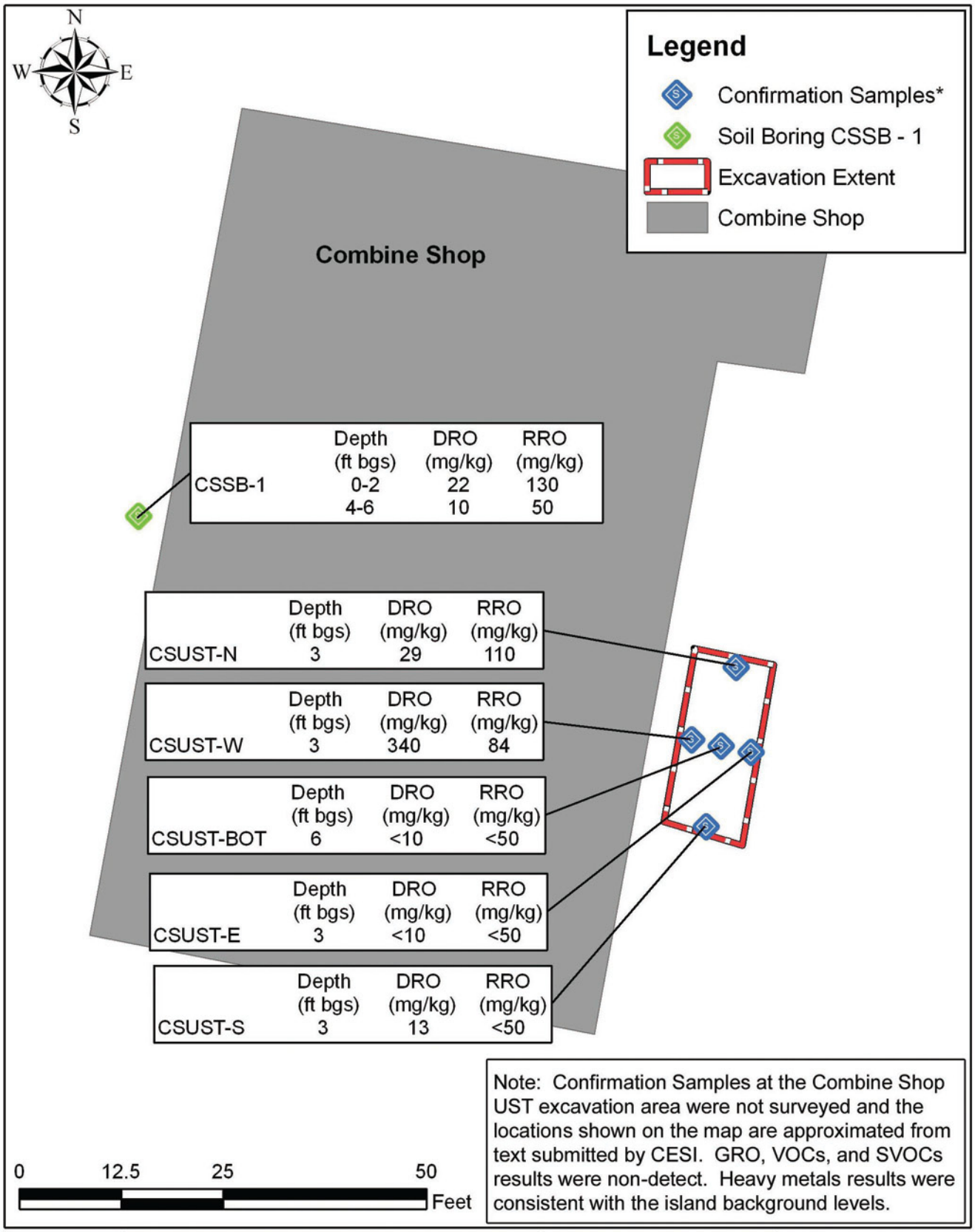


Figure 3	UST Removal, Excavation Extent, and Sampling Results Combine Shop St. Paul Island, Alaska	Sources: Combine Shop (NOAA GIS 2005), Excavation Extent and Sampling Locations (CESI GPS 2000).

Pribilof Islands Restoration Project

ATTACHMENT 1
ADEC METHOD ONE MATRIX CALCULATION

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE CONTAMINATED SITES REMEDIATION PROGRAM

GUIDANCE FOR CLEANUP OF PETROLEUM CONTAMINATED SITES

SOIL STORAGE AND DISPOSAL

Soil storage and disposal requirements are set out at 18 AAC 75.370. The regulations allow soil to be stockpiled on a liner. The contaminated soil must be 200 feet or more from a water source serving a Class A or Class B public water system and at least 100 feet from surface water, a private water system, or a Class C public water system. At all sites, contaminated soil that is temporarily stockpiled should be treated to meet cleanup levels within two years.

Contaminated soil should not be blended with uncontaminated soil (unless approved by DEC). If the site has multiple sources, segregate the soil into different stockpiles based on source types. Segregate soil based on field screening results and knowledge of historical activities, visual observations, and the type of products spilled. For example, segregate gasoline-contaminated soil from diesel or waste oil-contaminated soil.

The regulations set out bottom liner specifications for stockpiles in Table D of 18 AAC 75.370. For petroleum-contaminated soil, a 10-mil thick liner is required for short-term storage (less than 180 days). For long-term storage (more than 180 days), a 20-mil thick bottom liner is required. Contaminated stockpiles must be covered with a 6-mil or greater thickness of reinforced polyethylene liner. The liner should protect the contaminated stockpile from weather. The edges of the cover liner should lap over the bottom liner to prevent water from running through the soil in the stockpile. Use tires, ropes, or other materials to hold the cover in place. Inspect and maintain the stockpile regularly to ensure the cover and bottom liner material remains intact and that any liquid leachate from the soil is contained and does not migrate.

Prior DEC approval is required for offsite storage or disposal of soil or groundwater subject to the site cleanup rules (18 AAC 75.325(i)). If soil is transported offsite for treatment, it should be moved as a covered load in a manner that prevents loss of material during transport. In some cases, the disposal site may require approval of the DEC Solid Waste Program (18 AAC 60.025).

SOIL CLEANUP LEVELS

The regulations provide four different methods to determine soil cleanup levels at petroleum contaminated sites. Method one involves a table to calculate a matrix score and the cleanup level depends on the matrix score. Method two employs two different tables, one for individual contaminants and one for petroleum hydrocarbon ranges. Method three allows substitution of site-specific data parameters used in the method two equations. Method four involves the development and DEC approval of a site-specific risk assessment.

Early in the site cleanup process, the responsible party should carefully consider each of the four methods for determining the cleanup levels. The different methods have different data requirements and various advantages and disadvantages depending on the cleanup objectives and site-specific conditions.

Method one

Method one involves a table to determine the soil cleanup level for three different hydrocarbon ranges: gasoline range organics (GRO), diesel range organics (DRO), and residual range organics (RRO). Two different tables are provided at 18 AAC 75.341. Table A1 applies to non-arctic zones and Table A2 applies to manmade gravel pads in arctic zones. "Arctic zone" is defined at 18 AAC 75.990 and generally means areas north of latitude 68 degrees North. Other areas may be considered "arctic zone" based on a demonstration that the site is underlain by continuous permafrost.

Table A1 – Cleanup Levels in Non-arctic Zones

Table A1 is used to determine soil cleanup levels for GRO, DRO, and RRO. A matrix table is used to tally scores for five parameters: Depth to Groundwater, Mean Annual Precipitation, Soil Type, Potential Receptors, and Volume of Contaminated Soil. Each parameter has four to six possible scores, depending on site conditions. The five individual scores are added together to determine a total matrix score. Table A1 includes several notes to define terms and to assist with determining scores.

The matrix score is used to determine the soil cleanup level for GRO, DRO, and RRO. Based on the total matrix score, the site falls into one of four categories: Category A, Category B, Category C, or Category D. Each category has corresponding cleanup levels for GRO and DRO. The cleanup level for RRO is the same (2,000 mg/kg) for all categories.

For site cleanup under method one, sampling is not required for polynuclear aromatic compounds (PAHs) unless DEC requires a modification or site-specific analysis under 18 AAC 75.340(i). However, in addition to the soil cleanup levels for GRO, DRO, and RRO at Table A1, the site needs to also meet the most stringent levels for benzene, toluene, ethylbenzene, and total xylenes for the applicable exposure pathway as follows:

Table 2: BTEX cleanup levels from Table B1 of 18 AAC 75.341(c)

	Under 40 Inch Zone			**Over 40 Inch Zone**		
CHEMICAL NAME (**Carcinogenics in Bold Type**)	Ingestion	Inhalation	Migration to Groundwater (mg/kg)	Ingestion	Inhalation	Migration to Groundwater (mg/kg)
Benzene	290	9	0.02	230	6.4	0.02
Ethylbenzene	10000	89	5.5	8300	89	5
Toluene	20300	180	5.4	17000	180	4.8
Xylenes (total)	203000	81	78	166000	81	69

TABLE A1. METHOD ONE – PETROLEUM HYDROCARBON SOIL CLEANUP LEVELS IN NONARCTIC ZONES

(See notes to table for further requirements)

Part A: Determine score for each item*

1. Depth to Groundwater		
Less than 5 feet {Deepest contamination @ 3ft bgs, GW assumed 6ft bgs}	**(10)**	
5 feet to 15 feet	(8)	
More than 15 feet to 25 feet	(6)	
More than 25 feet to 50 feet	(4)	
More than 50 feet	(1)	
2. Mean Annual Precipitation		
More than 40 inches	(10)	
More than 25 inches to 40 inches	(5)	
15 inches to 25 inches {NWS says 23 in/yr}	**(3)**	
Less than 15 inches	(1)	
3. Soil Type (Unified Soil Classification)		
Clean, coarse-grained soils	(10)	
Coarse-grained soils with fines {based on Diesel Seep soils}	**(8)**	
Fine-grained soils (low organic carbon)	(3)	
Fine-grained soils (high organic carbon)	(1)	
4. Potential Receptors		
(Select the most applicable category)		
a. Public water system within 1000 feet, or private water system within 500 feet	(15)	
b. Public/private water system within 1/2 mile	(12)	
c. Public/private water system within one mile	(8)	
d. No water system within one mile	(4)	
e. **Nonpotable groundwater** {based on proximity to brackish SL Channel}	**(1)**	
5. Volume of Contaminated Soil		
More than 500 cubic yards	(10)	
More than 100 cubic yards to 500 cubic yards	(8)	
More than 25 cubic yards to 100 cubic yards	(5)	
10 cubic yards to 25 cubic yards {rough estimate based on CESI info}	**(2)**	
Less than 10 cubic yards	(0)	

*The items to be scored are defined in note 1 to this table.

Part B: Add scores from Part A to determine matrix score and cleanup level

Matrix Score for Each Category	Cleanup Level in mg/kg		
	Gasoline Range Organics	**Diesel Range Organics**	**Residual Range Organics**
Category A: More than 40	50	100	2000
Category B: More than 26 to 40	100	200	2000
Category C: 21-26 {total of 24}	**500**	**1000**	**2000**
Category D: Less than 21	1000	2000	2000

Notes to Table A1:
1. The following definitions for items 1 - 5 in Part A, apply for purposes of using method one:

a. "depth to groundwater" means the measurement from the lowest point of the zone of soil contamination to the seasonal high groundwater table; a responsible person may not claim a lower matrix score for soil by moving contaminated soil to a higher elevation relative to the groundwater table;

b. "mean annual precipitation" is defined at 18 AAC 75.990 and means the measurement of average yearly rainfall and the water equivalent of snowfall; this measurement may be obtained from the nearest weather station;

c. "soil type" means the predominant Unified Soil Classification (USC) soil type between the deepest point of contamination and the seasonal high groundwater table; a responsible person may seek to demonstrate that otherwise coarse-grained soil has an organic carbon content that might enable a lower point classification. Soil types using the USC system are further defined as shown in Figure 1:

Figure 1.

SOIL TYPE	UNIFIED SOIL CLASSIFICATIONS
Clean coarse-grained	GW, GP, SW, SP
Coarse-grained with fines	GM, GC, SM, SC, GP-GC, SP-SM, GW-GM, SW-SM, SW-SC
Fine-grained with low organic carbon	ML, CL, HM, CH
Fine-grained with high organic carbon	OL, OH, Pt

d. for the "potential receptors" categories,

(i) "public water system" and "private water system" have the meaning given those terms in 18 AAC 80.1990;

(ii) "nonpotable" means unusable for drinking water due to a water quality condition, such as salinity, that was not caused by or that does not arise from contamination at the site;

e. "volume of contaminated soil" means the total estimated volume of soil that is contaminated above the applicable cleanup level before a responsible person begins a removal or cleanup action.

2. For the potential receptors categories, a responsible person shall submit a demonstration supporting the score assigned, including the results of an approved water well survey; the most conservative score must be used to determine the proximity of potential receptors; for example, if a water system is within one-quarter mile, the category "public/private water system within one mile" that would score 8 would be superseded by the category "public/private water system within 1/2 mile" that would score 12.

3. The identity of a released refined petroleum product must be assumed to be unknown unless a responsible person demonstrates that the product is only gasoline, or only a refined nongasoline product; the department will waive the requirement that a product be identified by analysis if a responsible person demonstrates that only one type of product was stored or distributed at the site; the soil cleanup levels in Part B are based on gas chromatographic analytical measurements corresponding to a specific measured range of petroleum hydrocarbons as follows:

a. gasoline range organics: light-range petroleum products such as gasoline, with petroleum hydrocarbon compounds corresponding to an alkane range from the beginning of C_6 to the beginning of C_{10} and a boiling point range between approximately 60° Centigrade and 170° Centigrade;

b. diesel range organics: mid-range petroleum products such as diesel fuel, with petroleum hydrocarbon compounds corresponding to an alkane range from the beginning of C_{10} to the beginning of C_{25} and a boiling point range between approximately 170° Centigrade and 400° Centigrade;

c. residual range organics: heavy-range petroleum products such as lubricating oils, with petroleum hydrocarbon compounds corresponding to an alkane range from the beginning of C_{25} to the beginning of C_{36} and a boiling point range between approximately 400° Centigrade and 500° Centigrade.

4. In addition to meeting the soil cleanup levels in Part B, a responsible person shall ensure that the site meets the most stringent standards for benzene, toluene, ethylbenzene, and total xylenes for the applicable exposure pathway in Table B1 in (c) of this section.

(b) If a responsible person uses method one for an Arctic zone under 18 AAC 75.340, the soil cleanup levels must be based on Table A2 in this subsection.

Request for Conditional Closure
Tract 50 Drum Platform Foundation Site
NOAA Site 58
St. Paul Island, Alaska

Request for Conditional Closure

Site: The site is known as the Tract 50 Drum Platform Foundation Site and designated by NOAA as Site 58. This site is not listed under the Two Party Agreement (TPA; NOAA 1996). Herein, it is referred to as the "site."

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea (Figure 1). On the island, the Tract 50 Drum Platform Foundation Site is located just east of the Salt Lagoon Channel and north of the Tract 50 National Oceanic and Atmospheric Administration (NOAA) administrative structures (Figure 2).

Legal Property Description: The site is located in Township 35 South, Range 132 West, Section 25 of the Seward Meridian, Alaska, as shown on the plat of rectangular survey, officially filed April 18, 1997. The drum platform foundation was located primarily within NOAA-owned Tract 50, though approximately the northern most third was located outside of Tract 50 on Tanadgusix Corporation (TDX) property (Figure 2).

Type of Release: Diesel fuel spilled or leaked from drums or pipes during past operations at the site.

History and Background:
The area of the site is currently undeveloped and contains no aboveground structures. The area is the former location of a seal carcass byproducts plant dating back to 1918. The byproducts plant ceased operation once government management of commercial fur sealing ended in the early 1980s. The plant was demolished in 1988.

The byproducts plant used diesel fuel as heating oil. The fuel was stored in 55-gallon steel drums and transferred through steel piping. The drum storage platform, constructed of an approximately 125 foot (ft) long by 56 ft wide by 4 ft tall concrete wall and filled with soil, was located adjacent to the now demolished plant.

The former drum platform foundation was within an area designated for construction of a temporary dewatering cell to be used during the 2004 Army Corps of Engineers harbor improvement effort. The Corps and its contractor encountered suspected petroleum-contaminated soil (PCS) before construction began, and ultimately the Corps did not construct a dewatering cell at this location.

Summary of Site Investigations:
In April 2004, NOAA staff collected approximately 10 screening samples from the suspected PCS within the foundation walls for analysis with thin-layer chromatography (TLC). Analysis results indicated elevated levels of diesel-range organics (DRO), confirming the presence of PCS. NOAA also surveyed the PCS using its survey-grade global positioning system (GPS) and estimated the volume of PCS above the surrounding grade to be approximately 500 cubic yards (CY). Soil below the surrounding grade was not screened but was also suspected to be PCS.

Subsequent to the concrete and above grade PCS removal (see *Summary of Cleanup Actions*), NOAA staff and a third-party sampler from Tetra Tech collected soil samples from 16 Geoprobe Macrocore boring locations, from ground surface to a maximum depth of 8 ft below ground surface (bgs) (NOAA 2004a, NOAA 2004b). These samples were analyzed for DRO using TLC, with some of the samples sent to an off-island fixed laboratory for quantitative analysis for gasoline-range organics (GRO); DRO; residual-range organics (RRO); benzene, toluene, ethylbenzene, and total xylenes (BTEX); and select polynuclear aromatic hydrocarbons (PAHs). Samples from 8 of the 16 locations were found to contain DRO above the Alaska Department of Environmental Conservation (ADEC) Method Two cleanup level of 250 milligrams per kilogram (mg/kg). No other contaminants were found above their ADEC Method Two cleanup levels (NOAA 2004c).

In June 2004, Kelly-Ryan Inc. (KRI), as part of the Corps of Engineers Phase II Harbor Improvements Project, collected a total of five near-surface soil samples within Tract 50 to represent site conditions prior to their use of Tract 50 for the Harbor Improvement Project staging and sediments dewatering (KRI 2004). One of KRI's soil samples, located within the footprint of the former drum platform foundation, contained DRO above its ADEC Method Two cleanup level.

Groundwater data for the adjacent Diesel Seep Site (Sites 34 and 35/TPA Sites 13a and 13b) indicates that groundwater flow is from the east to the west (CESI 2001). Groundwater throughout the Diesel Seep Site is found at approximately +3.0 feet mean lower low water (MLLW; NOAA 2004a). Groundwater sampling results for five monitoring wells located at the Diesel Seep Site indicated that DRO was detected above its ADEC Table C cleanup level in two wells during 2000-2001 and in one well during 2004 (CESI 2001, IT Alaska 2002, Tetra Tech 2005; Figure 3).

Summary of Applied Cleanup Levels:
Because groundwater near the site contains contamination, ADEC Method Two cleanup levels, discussed at 18 AAC 75.341(c) (ADEC 2003), for contaminants of concern, excepting benzene, were applied to the site's corrective action. For benzene, NOAA had the option under the TPA to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). Cleanup criteria were applied to the maximum extent practicable (18 AAC 75.325(f), 18 AAC 75.990).

Summary of Cleanup Actions:
NOAA and its contractors commenced corrective action activities at the site on June 21, 2004. By June 22, 2004, they had completed the removal of 575 CY of above grade PCS from the site and the demolition of the drum platform foundation (NOAA 2004b, NOAA 2005). NOAA and its contractor remobilized to the site to excavate below grade PCS on October 19, 2004 (NOAA 2004c, NOAA 2005). During excavation, groundwater was consistently encountered at approximately 3 to 4 ft bgs. Excavation stopped at the groundwater table. On October 21, 2004, NOAA's contractor completed excavation, having removed an estimated 752 CY of below grade PCS and bringing the total volume of PCS removed during the corrective action to approximately 1,327 CY (Figure 4). PCS was removed to the extent practicable.

In addition to the removal of PCS, roofing tar, a solid waste, was removed from the site and loaded into 55-gallon drums and Supersacks™. NOAA disposed of the tar-soil in Supersacks™ with Rabanco in Seattle, Washington in March 2005. NOAA disposed of the six drums of tar pieces with Waste Management Inc. dba Columbia Ridge landfill in Arlington, Oregon in June 2005.

During this corrective action, NOAA's contractors transported PCS directly to either the ADEC-approved PCS stockpile on Tract 42 or NOAA's National Weather Service landspreading area (Figure 5). At Tract 42, the PCS was incorporated in to the municipal solid waste soil cover. At the landspreading area, the PCS was spread no more than 1.5 ft ± 0.5 ft deep and tilled to facilitate the reduction of petroleum product levels via aeration and microbial action (NOAA 2004d). Concrete pieces from the drum pad foundation were stockpiled at the Diesel Seep Site and subsequently used as backfill material at the Lukanin Bay PCS Site (Site 33/TPA Site 12c).

Backfill operations involved transporting clean fill from the Ridgewall scoria pit to the site, dumping the material into the excavation, and compacting the fill material. Approximately 708 CY of scoria were used to backfill the excavation. The backfilled area was leveled to the surrounding grade.

Confirmation soil samples collected from the excavation at the Tract 50 Drum Platform Foundation Site indicated concentrations of DRO exceeding the ADEC Method Two cleanup level of 250 mg/kg. DRO concentrations varied from not detected to 11,000 mg/kg with 14 of 27 samples exceeding the cleanup level (Tables 1 and 2; Figure 4). No other analytes exceeded cleanup levels. Samples exceeding the ADEC Method Two DRO cleanup level were collected from the bottom of the excavation, near the groundwater interface. Hence, further excavation in these areas was not practicable. Groundwater in the vicinity of the site is being addressed under a separate action.

Recommended Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action, to the maximum extent practicable, at the Tract 50 Drum Platform Foundation Site (NOAA Site 58) in accordance with the Agreement and that ADEC grant a conditional closure not requiring further remedial action from NOAA. NOAA understands ADEC will/may require additional containment, investigation, or cleanup if subsequent information indicates that the level of contamination that remains does not protect human health, safety, or welfare, or the environment.

References:

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels. Contaminated Sites Program*. July 17.

ADEC. 2003. Title 18 of the *Alaska Administrative Code* (18 AAC) 75, Articles 3 and 9. *Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. Effective date January 30, 2003.

Columbia Environmental Sciences, Inc. (CESI). 2001. *Draft Site Characterization Report, the Salt Lagoon Diesel Seep (TPA Site 13), St. Paul Island, AK*. Version 1.3. April 26.

IT Alaska Corporation (IT Alaska). 2002. *Diesel Seep (TPA 13) Site Characterization, Draft, St. Paul Island, Alaska*. February.

Kelly-Ryan Inc. 2004. Salt Lagoon Channel and Dewatering Area Testing Results. August 18.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two-Party Agreement, Attorney General's Office File No. 66-1-95-0126*. January 26.

NOAA. 2004a. *Final Corrective Action Plan, Sites 34 and 35, Two-Party Agreement Sites 13A and 13B, Diesel Seep Site (Uplands and Channel), St. Paul Island, Alaska*. National Oceanic and Atmospheric Administration Pribilof Project Office. June 23.

NOAA. 2004b. *Correction Action Plan Addendum #1, Sites 34 and 35, Two-Party Agreement Sites 13A and 13B, Diesel Seep Site (Uplands and Channel), St. Paul Island, Alaska*. National Oceanic and Atmospheric Administration Pribilof Project Office. June 19.

NOAA. 2004c. *Correction Action Plan Addendum #2, Sites 34 and 35, Two-Party Agreement Sites 13A and 13B, Diesel Seep Site (Uplands and Channel), St. Paul Island, Alaska*. National Oceanic and Atmospheric Administration Pribilof Project Office. October 28.

NOAA. 2004d. *Operations Work Plan, Petroleum Contaminated Soil Remediation by Landspreading, St. Paul Island, Alaska*. June 23.

NOAA. 2005. *Final Corrective Action Report, Tract 50 Drum Platform Foundation—Site 58, St. Paul Island, Alaska*. July 6.

Tetra Tech EMI (Tetra Tech). 2005. *Final Field Investigation Report, St. Paul Island, Alaska, Pribilof Islands Environmental Restoration Project, St. Paul Island, Alaska*. June 23.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

July 20, 2005
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed to the maximum extent practicable at the Tract 50 Drum Platform Foundation Site (NOAA Site 58) in accordance with the Agreement and that no further remedial action is required as a part of this conditional closure granted by ADEC.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

July 25, 2005
Date

Tables and Figures

Table 1. Analytical Data Summary - DRO, GRO, RRO, and BTEX Site 58 - Tract 50 Drum Platform Foundation St. Paul Island, Alaska

Sample ID	Sample Depth (feet bgs)	Diesel range organics (mg/kg)	Gasoline range organics (mg/kg)	Motor Oil range organics (mg/kg)	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Toluene (mg/kg)	Total Xylenes (mg/kg)
Confirmation Samples								
SP34-CS-101-015	1.5	10 U	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-102-020	2	**920**	2	180	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-103-030	3	10 U	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-104-030	3	25	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-105-030	3	**570**	27	50 U	0.02 U	0.02 U	0.02 U	0.22
SP34-CS-106-030	3	230	49	50 U	**0.2** U	0.02 U	0.02 U	0.06 U
SP34-CS-107-030	3	**4700**	40	210	0.02 U	0.02 U	0.02 U	0.21
SP34-CS-108-030	3	**400**	10 U	50 U	**0.1** U	0.1 U	0.1 U	0.3 U
SP34-CS-109-030	3	**6400**	91	50 U	**0.2** U	0.2 U	0.2 U	0.72
SP34-CS-109-300[a]	3	**4300**	180	50 U	**0.2** U	0.31	0.2 U	1.7
SP34-CS-110-030	3	**11000**	65	410	**0.2** U	0.2 U	0.2 U	0.6 U
SP34-CS-111-030	3	**480**	6	70	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-112-030	3	**4900**	23	250	0.02 U	0.02 U	0.02 U	0.14
SP34-CS-113-030	3	**730**	10 U	75	**0.2** U	0.2 U	0.2 U	0.6 U
SP34-CS-114-030	3	**390**	13	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-115-030	3	27	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-116-030	3	**300**	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-116-300[b]	3	**360**	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-117-030	3	10 U	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-118-030	3	28	1 U	81	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-119-030	3	**1200**	20 U	170	**0.2** U	0.2 U	0.2 U	0.6 U
SP34-CS-120-030	3	**11000**	160 J	50 U	**0.2** U	0.2 J	0.2 U	1.1 J
SP34-CS-121-030	3	10 U	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-122-030	3	**3100**	37	50 U	**0.2** U	0.2 U	0.2 U	0.6 U
SP34-CS-123-030	3	10 U	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-124-030	3	10 U	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-124-300[c]	3	28	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-125-030	3	45	3	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-126-020	2	43	1 U	300	0.02 U	0.02 U	0.02 U	0.06 U
SP34-CS-127-030	3	26	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
Stockpile Samples								
SP34-SS-101-015	1.5	18	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-SS-102-015	1.5	**11000**	**2200**	1200	**0.7**	**6.3**	1.5	38
SP34-SS-103-015	1.5	**400**	10 U	50 U	**0.2** U	0.2 U	0.2 U	0.6 U
SP34-SS-103-300[d]	1.5	250	10 U	50 U	0.02 U	0.1	0.02 U	0.12
SP34-SS-104-015	1.5	10 U	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U

Sample ID	Sample Depth (feet bgs)	Diesel range organics (mg/kg)	Gasoline range organics (mg/kg)	Motor Oil range organics (mg/kg)	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Toluene (mg/kg)	Total Xylenes (mg/kg)
SP34-SS-105-015	1.5	**990**	35	100	**0.2** U	0.2 U	0.2 U	0.6 U
SP34-SS-106-015	1.5	**1300**	18	50 U	0.02 U	0.02 U	0.02 U	
SP34-SS-107-015	1.5	24	1 U	91	0.02 U	0.02 U	0.02 U	0.06 U
Backfill Characterization Samples								
SP34-BS-001-015	1.5	10 U	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-BS-002-015	1.5	10 U	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-BS-003-015	1.5	10 U	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
SP34-BS-003-315[e]	1.5	10 U	1 U	50 U	0.02 U	0.02 U	0.02 U	0.06 U
ADEC Method Two Cleanup Level[f]		250	300	10,000	0.5[g]	5.5	5.4	78

Notes (Table 6-1)

bold Indicates concentration above cleanup levels.
bgs Below ground surface
mg/kg Milligram per kilogram
U Analyte was analyzed for, but not detected above the sample reporting limit
J Analyte was positively identified, but the numerical value is an estimated concentration; result is considered qualitatively acceptible, but quanitatively unreliable
a Duplicate of sample number SP34-CS-109-030
b Duplicate of sample number SP34-CS-116-030
c Duplicate of sample number SP34-CS-124-030
d Duplicate of sample number SP34-SS-103-015
e Duplicate of sample number SP34-BS-003-015
f Unless otherwise noted, cleanup level is from Title 18 of the *Alaska Administrative Code* 75 "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska effective January 30, 2003.
g Under the Two Party Agreement, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg). However, NOAA has attempted to remove benzene to within the current ADEC Method Two cleanup level (0.02 mg/kg) to the maximum extent practicable.

Table 2. Analytical Data Summary - Polynuclear Aromatic Hydrocarbons Site 58 - Tract 50 Drum Platform Foundation St. Paul Island, Alaska

Sample ID	Sample Depth (feet bgs)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benz(a) anthracene (mg/kg)	Benzo(a) pyrene (mg/kg)	Benzo(b) fluoranthene (mg/kg)	Benzo (g,h,i) perylene (mg/kg)	Benzo(k) fluoranthene (mg/kg)
Confirmation Samples									
SP34-CS-105-030	3	0.022	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP34-CS-109-030	3	0.28	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
SP34-CS-114-030	3	0.025	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP34-CS-117-030	3	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP34-CS-122-030	3	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
SP34-CS-124-030	3	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP34-CS-124-300[a]	3	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

Sample ID	Sample Depth (feet bgs)	Acenaph-thene (mg/kg)	Acenaph-thylene (mg/kg)	Anthracene (mg/kg)	Benz(a) anthracene (mg/kg)	Benzo(a) pyrene (mg/kg)	Benzo(b) fluoran-thene (mg/kg)	Benzo (g,h,i) perylene (mg/kg)	Benzo(k) fluoran-thene (mg/kg)
Stockpile Samples									
SP34-SS-103-015	1.5	0.016	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP34-SS-103-300[b]	1.5	0.01	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP34-SS-107-015	1.5	0.098	0.05 U	0.12	0.17	0.17	0.19	0.077	0.08
Backfill Characterization Samples									
SP34-BS-001-015	1.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP34-BS-002-015	1.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP34-BS-003-015	1.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP34-BS-003-315[c]	1.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
ADEC Method Two Cleanup Level[d]		210	n/a	4,300	6	3	20	n/a	200

Sample ID	Sample Depth (feet bgs)	Chrysene (mg/kg)	Dibenzo(a,h) anthracene (mg/kg)	Fluoran-thene (mg/kg)	Fluorene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Naphthalene (mg/kg)	Phenan-threne (mg/kg)	Pyrene (mg/kg)
Confirmation Samples									
SP34-CS-105-030	3	0.005 U	0.005 U	0.005	0.075	0.005 U	0.066	0.057	0.007
SP34-CS-109-030	3	0.05 U	0.05 U	0.05 U	1	0.05 U	0.05 U	0.34	0.05 U
SP34-CS-114-030	3	0.005 U	0.005 U	0.005 U	0.084	0.005 U	0.005 U	0.026	0.005 U
SP34-CS-117-030	3	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP34-CS-122-030	3	0.05 U	0.05 U	0.05 U	0.44	0.05 U	0.05 U	0.18	0.05 U
SP34-CS-124-030	3	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP34-CS-124-300[a]	3	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Stockpile Samples									
SP34-SS-103-015	1.5	0.005 U	0.005 U	0.005 U	0.06	0.005 U	0.12	0.04	0.005 U
SP34-SS-103-300[b]	1.5	0.005 U	0.005 U	0.005 U	0.038	0.005 U	0.077	0.029	0.005 U
SP34-SS-107-015	1.5	0.19	0.05 U	0.37	0.087	0.074	0.05 U	0.4	0.35
Backfill Characterization Samples									
SP34-BS-001-015	1.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.02 U
SP34-BS-002-015	1.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.02 U
SP34-BS-003-015	1.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.02 U
SP34-BS-003-315[c]	1.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.02 U
ADEC Method Two Cleanup Level[d]		620	6	2,100	270	54	43	n/a	1,500

Notes

bgs Below ground surface

mg/kg Milligram per kilogram

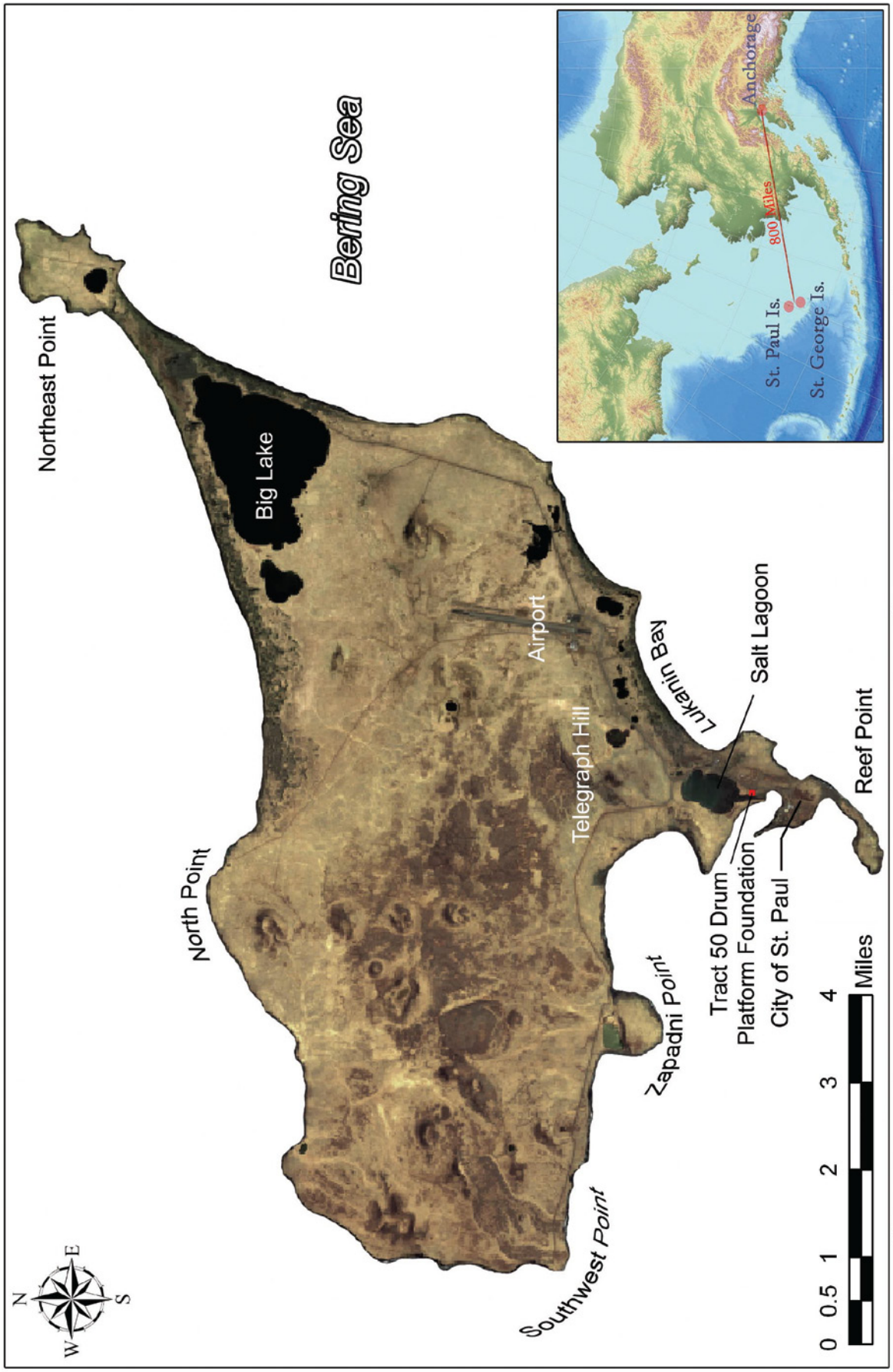
U The analyte was analyzed for but not detected above the sample reporting limit.

a Duplicate of sample number SP34-CS-124-030

b Duplicate of sample number SP34-CS-103-015

c Duplicate of sample number SP34-BS-003-015

d Unless otherwise noted, cleanup level is from Title 18 of the *Alaska Administrative Code* 75 Oil and Hazardous Substances Pollution Control Regulations published by the State of Alaska effective January 30, 2003.



Source: Ikonos Satellite Imagery, 2001

Pribilof Islands Restoration Project

Figure 1

St. Paul Island Vicinity Map
Tract 50 Drum Platform Foundation
Site 58
St. Paul Island, Alaska

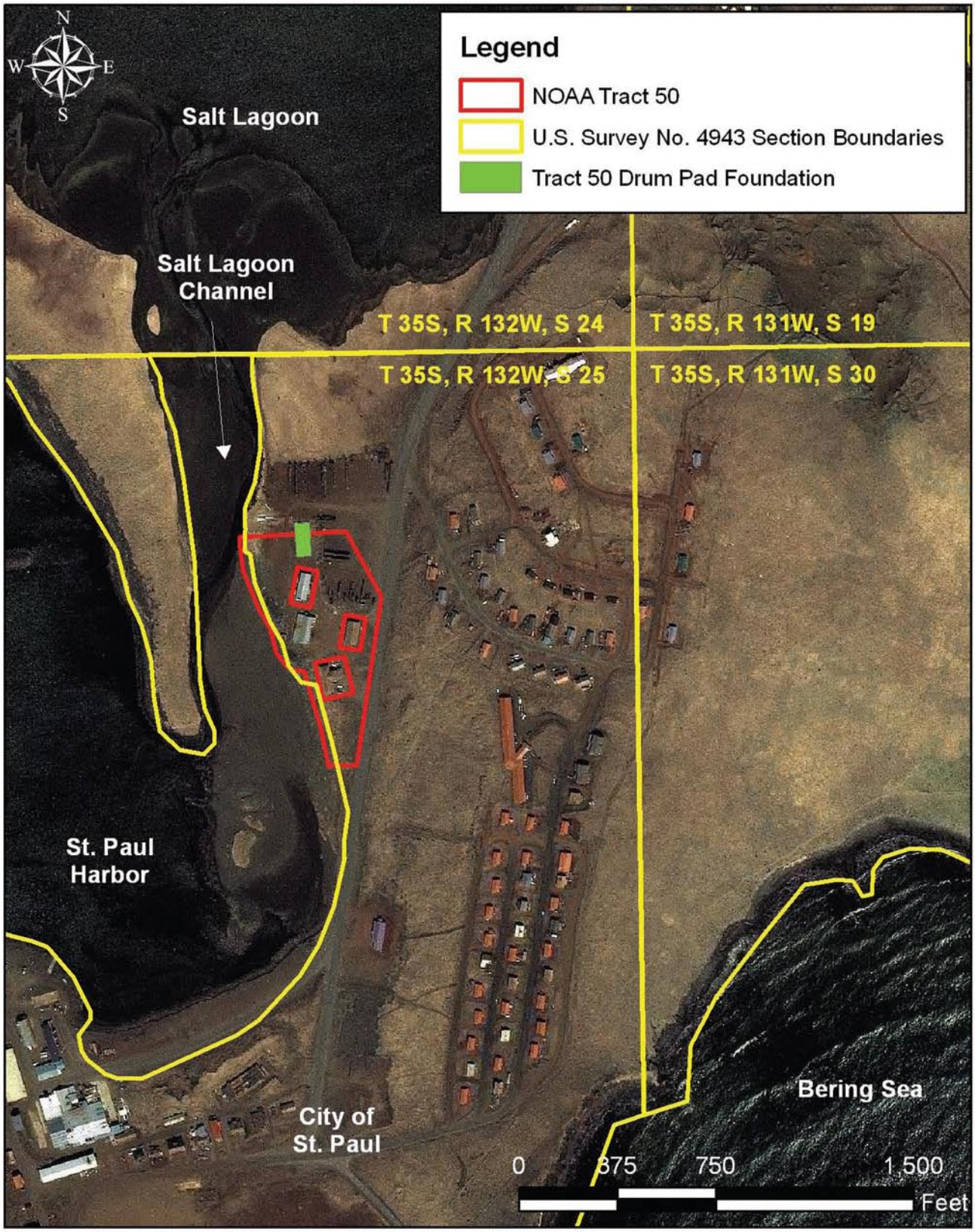


Figure 2	Legal and Property Description Tract 50 Drum Platform Foundation Site NOAA Site 58 St. Paul Island, Alaska	Sources: Public Land Survey Sections (BLM 1983), Site Location (NOAA 2004), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

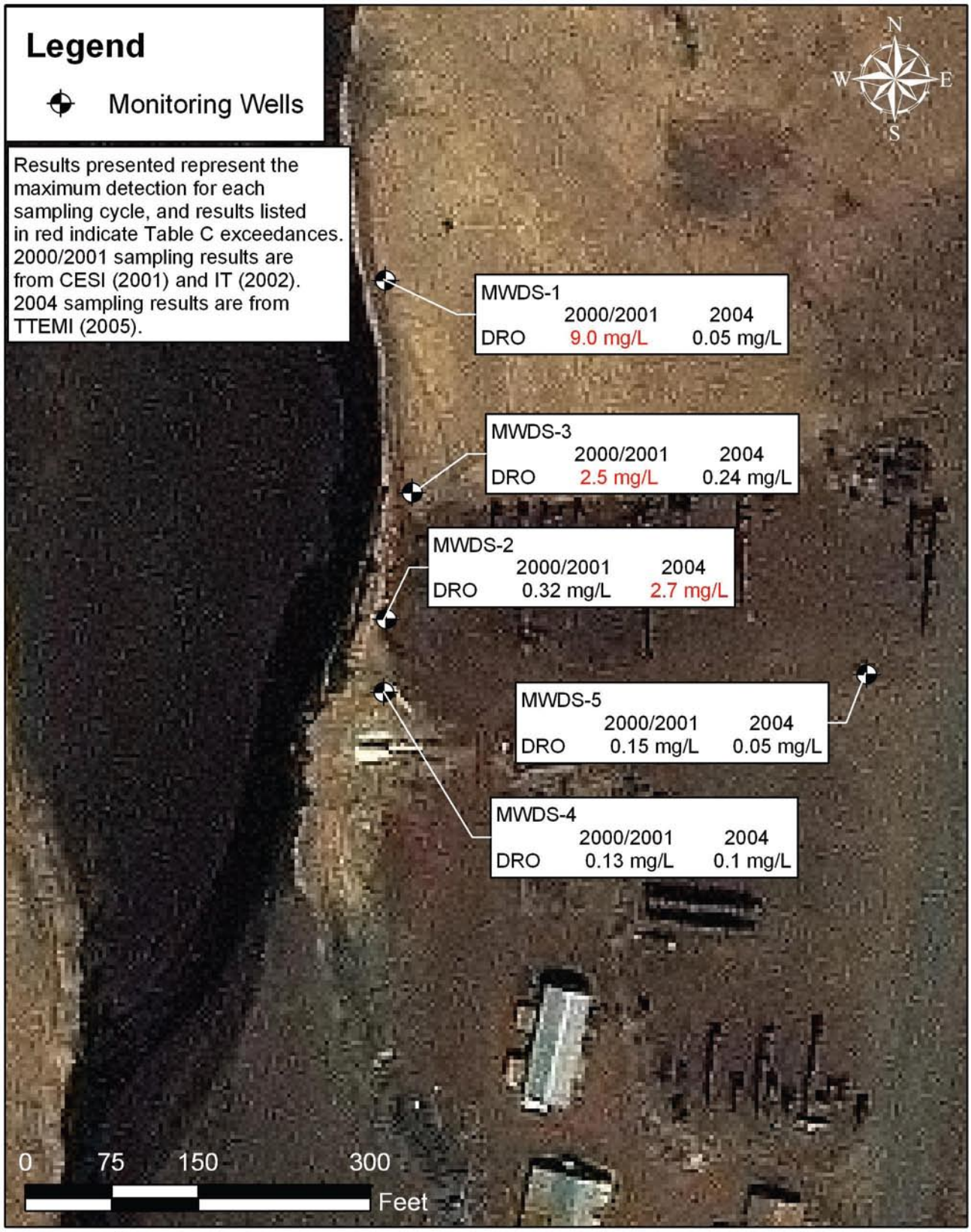


Figure 3	Groundwater Sampling Locations and Results Salt Lagoon Diesel Seep NOAA Sites 34 and 35/TPA Sites 13a and 13b St. Paul Island, Alaska	Sources: Monitoring Well Locations and Sampling Results (NOAA 2005), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

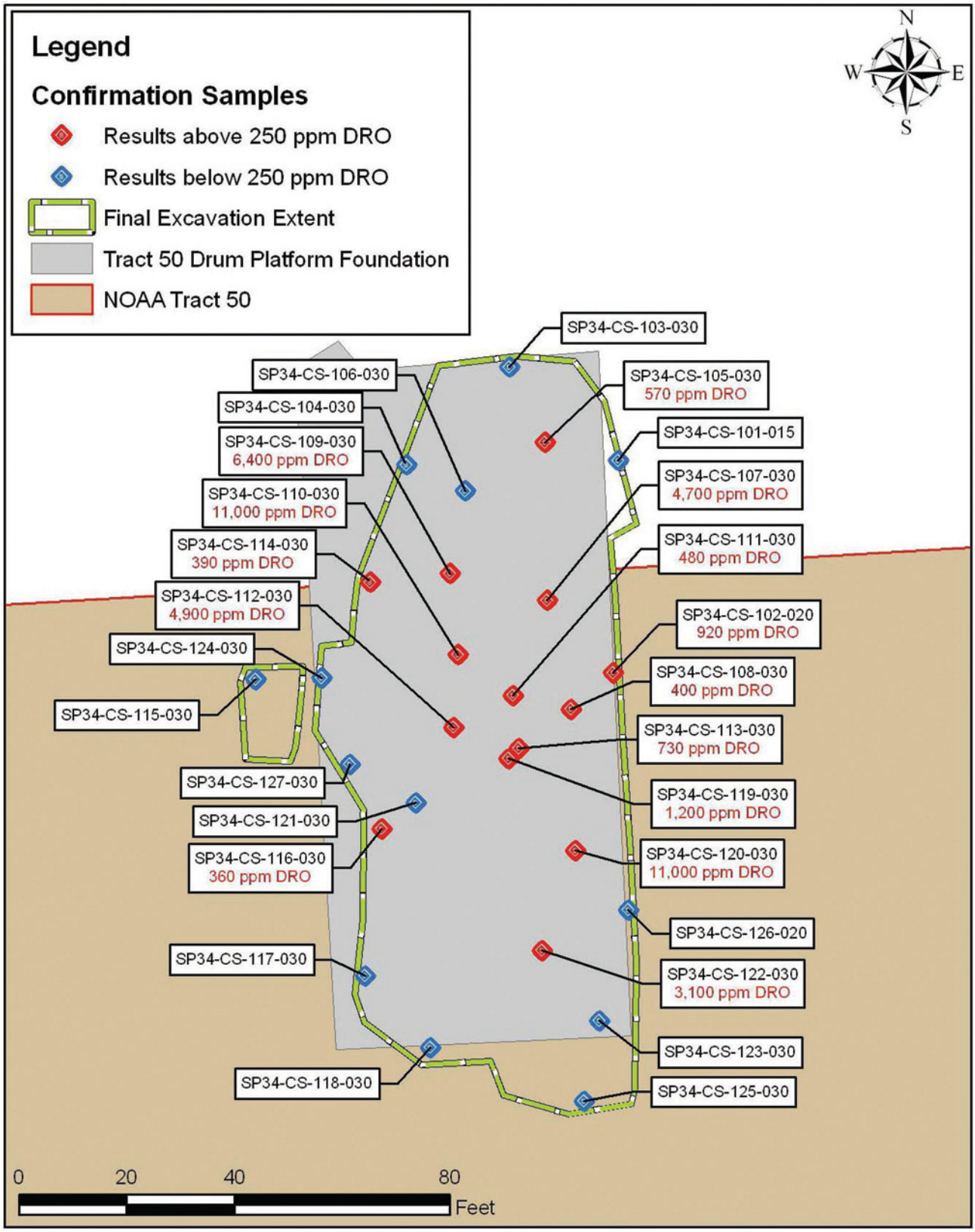


Figure 4	Confirmation Sampling Locations Tract 50 Drum Platform Foundation Site 58 St. Paul Island, Alaska	Sources: Sampling Locations and Excavation Extent (NOAA Pribilof Project GIS 2005), Tract 50 (BLM MTPs 1983).

Pribilof Islands Restoration Project

Figure 5	Transportation to the ADEC-approved PCS stockpile on Tract 42 and NOAA's National Weather Service landspreading area Tract 50 Drum Platform Foundation Site 58 St. Paul Island, Alaska	Sources: Landspreading site, Tract 42 PCS stockpile, and Drum Pad Foundation (NOAA Pribilof Project GIS 2005), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

NOAA Site 59
NTPA: Big Polovina Debris Stockpile

Letter from John Lindsay to Louis Howard RE: Technical Memorandum, Characterization Soil Sample Collection at the Former Big Polovina Hill Debris Pile. Dated January 3, 2006.....1349

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office
7600 Sand Point Way N.E
Seattle, Washington 98115
Ph: 206-526-6965, fax: 206-526-4819

January 3, 2006

Mr. Louis Howard
Project Manager
Alaska Department of Environmental Conservation
Division of Spill Prevention and Response
Contaminated Sites Program
555 Cordova Street
Anchorage, AK 99501-2617

Subject: Technical Memorandum, Characterization Soil Sample Collection at the Former Big Polovina Hill Debris Pile

Dear Mr. Howard:

Introduction:
The Alaska Department of Environmental Conservation (ADEC) on May 24, 2001 sent NOAA a response to its May 2, 2001 *Draft Site Closure Report Big Polovina Hill Debris Staging Area (Non-Two Party Agreement Site) Pribilof Islands Site Restoration Project, St. Paul Island, Alaska* submission written by NORTECH Environmental and Engineering Consultants (NORTECH 2001). ADEC stated, "Prior to ADEC granting site closure, the sampling results will need to be below 2,000 mg/kg for DRO and RRO (Table A1 Category D) and written documentation the soils were successfully treated by NOAA's enhanced thermal conduction remediation system…" (ADEC 2001). On a telephone conversation with you on October 3, 2005, I expressed how ADEC's May 24, 2001 letter "slipped through the cracks", and that NOAA failed to meet ADEC's stipulation. I commented that on September 28, 2005 I revisited the site to look for the "stained area" described in the draft report, and how I could not relocate this area either because the surface soil was wet and/or vegetation may have overgrown the stained area. Further, while NOAA's contractor for the debris removal at the site took six soil samples, the contractor did not take locational data for the sample locations. Therefore, finding the "stained area" appeared no longer possible. ADEC agreed that NOAA should take samples at three locations within the approximate 400 ft^2 former debris pile site, and that the findings would determine the need justification for further removal. The accompanying Technical Memorandum documents the field investigation and the subsequent analytical results followed by a request for confirmation of no further action.

TECHNICAL MEMORANDUM
CHARACTERIZATION SOIL SAMPLE COLLECTION AT THE FORMER BIG POLOVINA HILL DEBRIS PILE, ST. PAUL ISLAND, ALASKA

The St. Paul Island, Alaska, Big Polovina Hill Debris Site (debris site) on Tract 38 is owned by the National Oceanic and Atmospheric Administration (NOAA). The site is also known as NOAA Site 44, a non-Two Party Agreement (TPA) site (NOAA 1996). St. Paul Island is approximately 800 miles southwest of Anchorage in the Bering Sea (Figure 1). Big Polovina Hill is located at the easterly end of the island, approximately 2 miles northeast of the airport, at Latitude: 57 11 7.40 N Longitude: 170 11 36.38 W. The east edge of this approximate 400 square foot site is located within approximately three feet of a covered petroleum contaminated soil (PCS) stockpile placed by Tanadgusix (TDX) Corporation in 1997 (NOAA 2003a).

NOAA work at the Big Polovina Hill Debris Site began in 1999 with a small area at the base of Polovina Hill where several rusted drums, some wooden cable spools, and some miscellaneous items were relocated to within tract 38, and placed on a 60-mil ethylene diene propylene monomer liner (Tetra Tech 1999). In 2000, NORTECH consolidated additional inert items to this area within Tract 38 and performed confirmation sampling following their subsequent removal and off island disposal (NORTECH 2001). NORTECH's confirmation sampling described in their 2001 Draft Site Closure Report, targeted a visibly stained area recognized following the removal of the pile and the liner. Among the confirmation samples taken by NORTECH, only the stained area demonstrated PCS in the form of diesel range organics (DRO) above the 18 AAC 75.341 Method Two cleanup standard applied to the site. Residual range organics (RRO) co-occurred with the DRO, but at a concentration below the Method Two cleanup standard. The NORTECH report recommended a limited field screening and soil cleanup action for the site, which was agreed to by ADEC (2001). During the fall of 2005, NOAA submitted a sampling plan (NOAA 2005) for the collection of soil samples at the site to characterize potential petroleum contamination identified in an earlier sampling effort by NORTECH (2001). Following ADEC approval (ADEC 2005), NOAA carried out its sampling plan in October 2005.

Summary of Response Activities:

On October 15, 2005, NOAA employees John Lindsay, Bernie Denno, and James P. Wright, P.E. collected 2 samples at each of 3 locations at the site as shown in Figure 2. Photographs of the sampling activities are provided in the attached Photo Log. At each sample location approximately 6 inches of soil was removed by hand shovel and pick. Then State qualified sampler, James P. Wright, P.E collected a soil sample using a new wooden survey stake and sealed the sample in a plastic bag. The sample was then mixed by agitating it the bag and placed into a 40 milliliter glass jar. The same location was then excavated to a depth of 18 inches and a second sample was collected in a like manner. A duplicate sample was taken from the 18 inch depth at the location of sample SP44-CH001. NOAA drove wooden stakes into the ground at each sample location so they may be recovered in the future if necessary.

The samples were stored in a freezer at the NOAA staff quarters until being shipped to the laboratory on Monday, October 17, 2005. The laboratory (Friedman Bruya, Seattle Washington) received the samples on Tuesday, October 18. During shipment, the two sample jars from location SP44-CH003 broke. The laboratory notified NOAA of this fact on Monday, October 24. The samples' soil had commingled in the bottom of the shipping cooler, which had not been stored in a refrigerator since being received by the lab. Since the samples were from the same location, but at different depths, NOAA directed the laboratory to combine the two samples and homogenize them into one and complete the analysis, and to note the conditions on the laboratory report. These two samples had been stored in the shipping cooler at room temperature for six days before the laboratory staff discovered the glass jars had broken in transit. The samples conditions were inconsistent with the NOAA Master Quality Assurance Plan (NOAA 2003b). However, DRO and RRO contain predominantly relatively low volatility constituents. Therefore, the analytical results of the soil samples are considered useful. This sample is considered a composite sample representing the depth of near surface to 18 inches.

Analytical Results

The analytical results show that the soil samples do not exceed ADEC soil cleanup standards under 18 AAC 75.340 Method Two, Table B-2 for DRO or RRO as shown in Table 1. DRO results ranged from undetected (with a sample quantitation limit of 10 milligrams per kilogram [mg/kg]) to a high of 97 mg/kg. RRO results ranged from undetected (with a sample quantitation limit of 50 mg/kg) to a high of 480 mg/kg. Laboratory analytical reports are provided in Appendix A.

Conclusions

The debris staging area covered a relatively small area; approximately 400 square feet. Previous confirmation samples found PCS in a much smaller portion, the visibly stained area, of that small area. The inert wood and metal debris removed in 2000 had been staged atop a non-porous liner. The debris staging area lied within three feet of a TDX PCS stockpile. No indications exist that the stained area represented anything more than either: (1) a minor lubricating oil release from a piece of equipment temporarily parked at the spot either during debris placement or removal, or during the construction of the TDX PCS stockpile; or (2) soil inadvertently spilled during construction of the TDX PCS stockpile.

Recommended Action:

NOAA requests that ADEC provide written confirmation on the attached page that NOAA completed all appropriate investigation and remediation to the maximum extent required at the Big Polovina Hill Debris Site, St. Paul Island. NOAA requests ADEC grant a conditional closure that will not require further investigation or remedial action from NOAA. NOAA understands ADEC will require additional containment, investigation, or cleanup if subsequent information indicates that the level of residual contamination does not protect human health, safety, or welfare, or the environment.

Please sign one copy of the attached Written Confirmation Page and return it to NOAA for our records. If you have any questions, please contact me either in writing or at 206/526-4560.

Sincerely,

John Lindsay
Pribilof Project Office Manager

cc St. Paul Island RAB Members

REFERENCES

Alaska Department of Environmental Conservation (ADEC). 2001. *Draft Site Closure Report Big Polovina Hill Debris Staging Area (Non-Two Party Agreement Site) Pribilof Islands Restoration Project St. Paul Island, AK*. May 2.

ADEC. 2005. *Sampling Plan Big Polovina Hill Debris Site 44, St. Paul Island, Alaska*. Letter from Louis Howard, Project Manager, ADEC to John Lindsay, NOAA. October 6.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*, Attorney General's Office File No. 66 1-95-0126. January 26.

NOAA. 2003a. *Big Polovina Scoria Pit PCS Stockpile Removal*. Letter from John Lindsay, NOAA Pribilof Project Office Project Manager, to Ron Philemonoff, CEO Tanadgusix Corporation. October 8.

NOAA. 2003b. *Master Quality Assurance Plan. Pribilof Islands Environmental Restoration Project*. May.

NOAA. 2005. *Sampling Plan and Waiver Request for Third Party Sampler, Big Polovina Hill Debris Site, Site 44/Non-Two Party Agreement*. Letter to Mr. Louis Howard, Environmental Specialist, Department of Environmental Conservation, Contaminated Sites Program. October 6.

NORTECH Environmental & Engineering Consultants (NORTECH). 2001. *Big Polovina Hill Debris Staging Area (Non Two-Party Agreement Site)*. May 2.

WRITTEN CONFIRMATION PAGE

For the National Oceanic and Atmospheric Administration:

John Lindsay
NOAA, Pribilof Project Office

Date

Approvals: This is to confirm that all investigative and corrective action has been completed to the maximum extent required at the Big Polovina Hill Debris Site, St. Paul Island, Alaska, with cleanup criteria applied to the maximum extent practicable (18 AAC 75.325 (f), 18 AAC 75.990) and that no further investigation or remedial action is required as a part of this conditional closure granted by ADEC.

For the Alaska Department of Environmental Conservation:

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

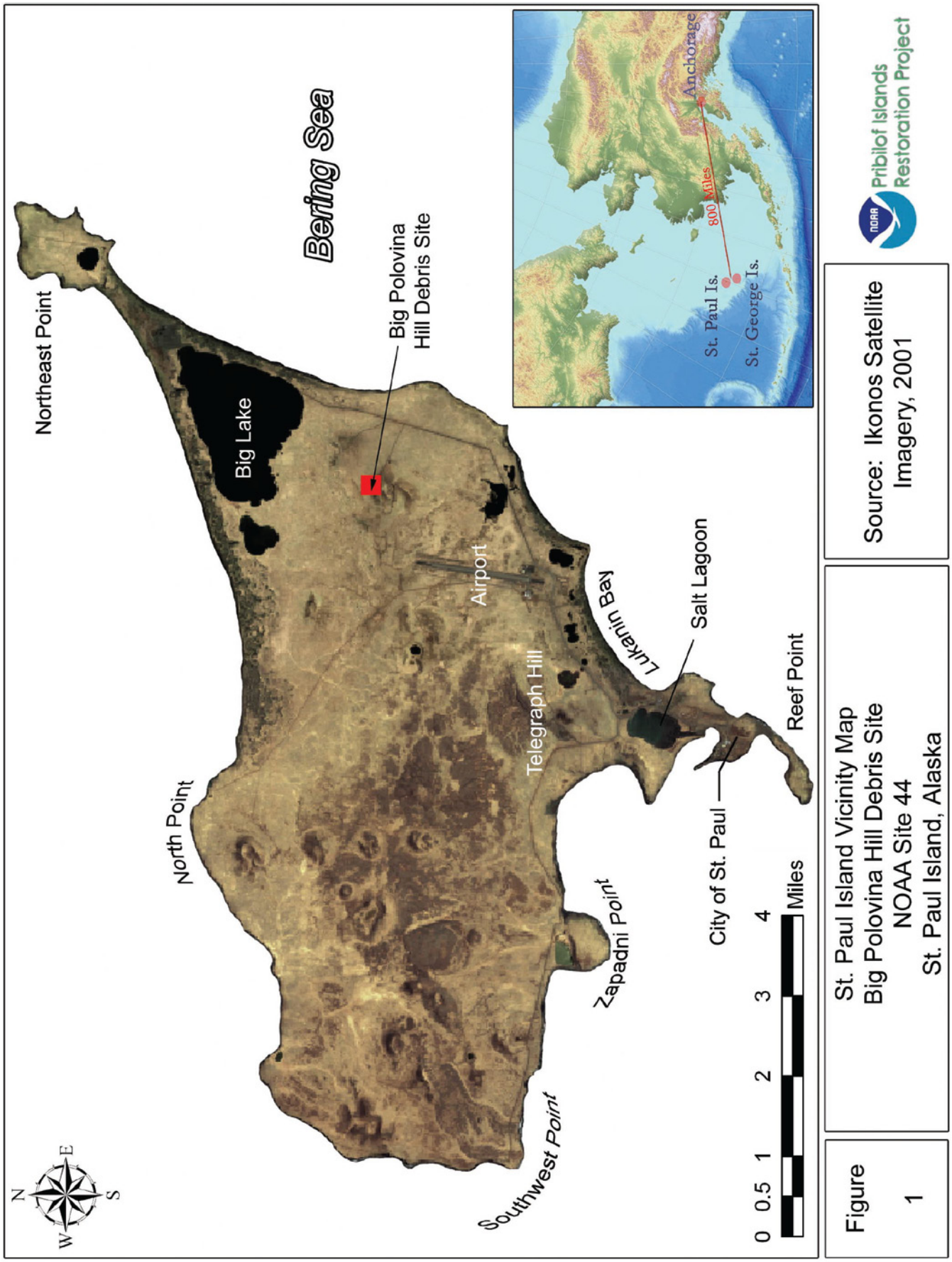
Date

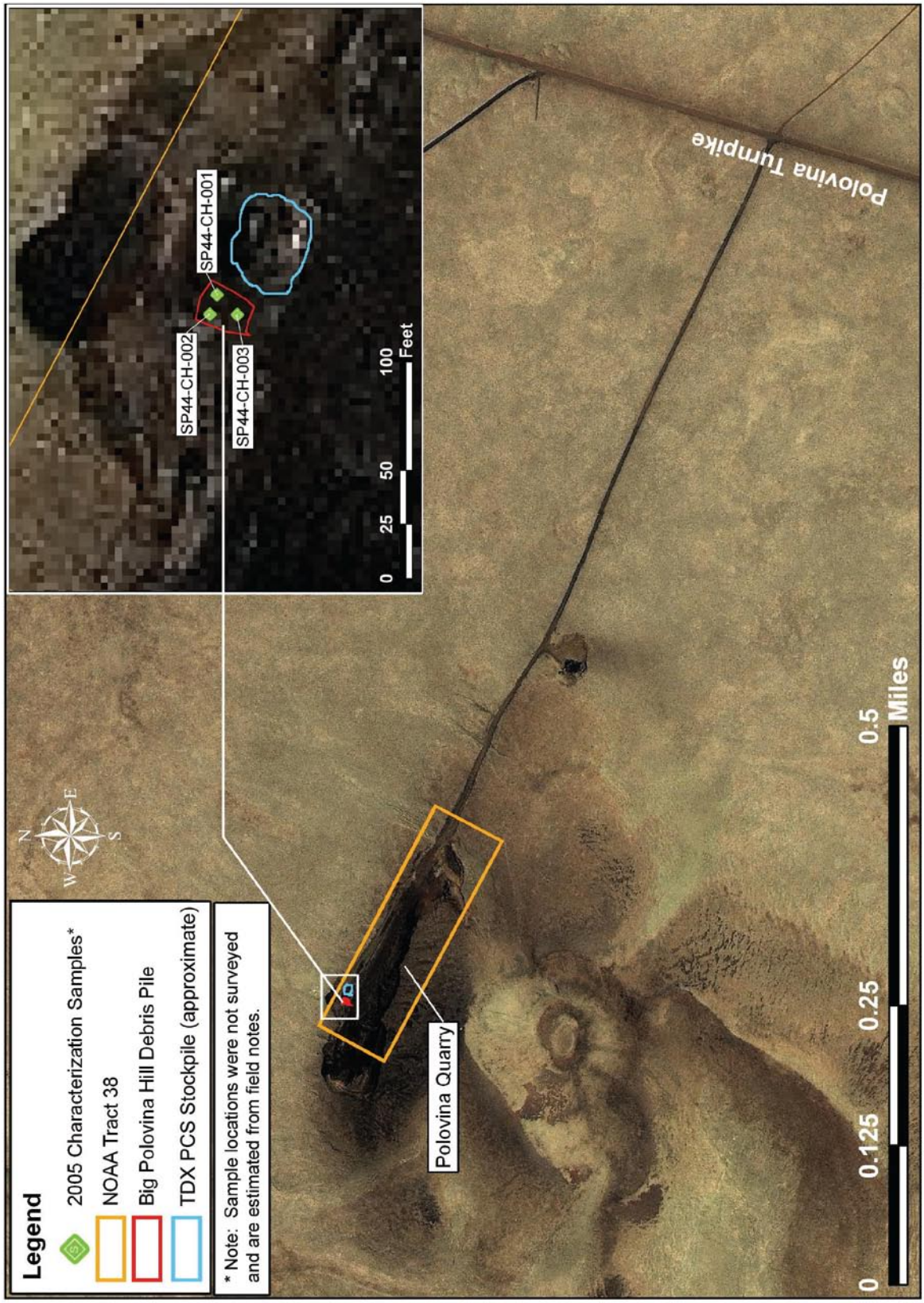
TABLE 1. Soil Characterization Sampling Results, Big Polovina Hill Debris Pile, St. Paul Island, Alaska

Sample Identification	**Analytical Results**	
	AK102 DRO (mg/kg)	**AK103 RRO (mg/kg)**
SP44-CH001-005	97	480
SP44-CH001-015	12	115
SP44-CH001-100 (duplicate of SP44-CH001-015)	24	115
SP44-CH002-005	<10	72
SP44-CH002-015	<10	94
SP44-CH003-005*		
SP44-CH003-015*	<10	93
Table B2 Method Two migration to groundwater cleanup levels	250	11,000
Table B2 Method Two Inhalation cleanup levels	12,500	22,000
Table B2 Method Two Ingestion cleanup levels	10,250	10,000

AK 102 DRO - State of Alaska method 102 for analysis of Diesel Range Organics
AK 103 RRO - State of Alaska method 102 for analysis of Diesel Range Organics
ADEC - Alaska Department of Environmental Conservation
Table B2 Method Two - Cleanup levels under 18 AAC 75.340
* Samples SP44-CH003-005 and SP44-CH003-015 composited together, and were stored for 6 days at room temperature prior to analysis.

FIGURES


Bering Sea
Northeast Point
Big Lake
Big Polovina
Hill Debris Site
Airport
Telegraph Hill
Lukanin Bay
Salt Lagoon
Reef Point
City of St. Paul
North Point
Zapadni Point
Southwest Point
0 0.5 1 2 3 4
Miles
N
E
S
W
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Source: Ikonos Satellite
Imagery, 2001
Pribilof Islands
Restoration Project
St. Paul Island Vicinity Map
Big Polovina Hill Debris Site
NOAA Site 44
St. Paul Island, Alaska
Figure
1



Pribilof Islands Restoration Project

Sources: Tract 38 (BLM MTPs 1983), Debris Pile (TTEMI 2000), Sample Locations (NOAA 2005), Satellite Imagery (Ikonos 2001).

Site Vicinity Map and Sampling Locations
Big Polovina Hill Debris Site
NOAA Site 44
St. Paul Island, Alaska

Figure
2

Photo Log
October 15, 2005 Characterization Sampling at the Big Polovina Hill Debris Pile
St. Paul Island, Alaska

Photograph 1. NOAA employees digging to 18 inches deep at sample location SP44-CH001 at the Big Polovina Hill Debris Pile site, facing north. October 15, 2005.

Photograph 2. Disturbed soil showing locations of the three characterization samples collected by NOAA on October 15, 2005. Facing Northeast.

NOAA Site 60
NTPA: Lead Contaminated Soils

Corrective Action Report/Conditional Closure Request
NOAA Site 60/Non-TPA – Lead Contaminated Soils,
St. Paul Island, Alaska 1359

Corrective Action Report/Conditional Closure Request
NOAA Site 60/Non-TPA – Lead Contaminated Soils
St. Paul Island, Alaska

February 7, 2007

Prepared By:

National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE
Seattle, Washington 98115

CONTENTS

ACRONYMS AND ABBREVIATIONS 1362
EXECUTIVE SUMMARY 1363
1.0 INTRODUCTION 1363
2.0 SITE DESCRIPTION 1364
2.1 SITE BACKGROUND 1364
2.2 SITE GEOLOGY 1365
2.3 SITE HYDROGEOLOGY 1365
2.4 PREVIOUS INVESTIGATIONS AND CORRECTIVE ACTIONS 1365
3.0 FIELD ACTIVITIES 1366
3.1 CONTRACTORS AND EQUIPMENT 1366
3.2 SITE INVESTIGATION ACTIVITIES 1367
3.3 SOIL TREATABILITY STUDY AND REGULATOR COORDINATION ACTIVITIES 1368
3.4 SOIL TREATMENT AND EXCAVATION ACTIVITIES 1368
3.5 DISPOSAL 1371
3.6 BACKFILLING AND SITE RESTORATION 1371
3.7 INVESTIGATION-DERIVED WASTE MANAGEMENT 1371
3.8 SITE SURVEYING 1372
3.9 HISTORIC PRESERVATION 1372
4.0 FIELD SCREENING AND ANALYTICAL SAMPLING 1372
4.1 FIELD-PORTABLE X-RAY FLUORESCENCE SCREENING SAMPLES 1372
4.2 FIXED-LABORATORY SAMPLES 1373
5.0 ANALYTICAL RESULTS 1373
5.1 SITE CHARACTERIZATION SAMPLES 1374
5.2 TREATABILITY STUDY SAMPLES 1374
5.3 POST-TREATMENT WASTE DESIGNATION 1374
5.4 EXCAVATION-DIRECTING IN-SITU SAMPLES 1374
5.5 CONFIRMATION SAMPLES 1374
5.6 BACKFILL CHARACTERIZATION SAMPLES 1374
6.0 QUALITY ASSURANCE AND QUALITY CONTROL 1375
7.0 CONCEPTUAL SITE MODEL 1375
7.1 HISTORICAL SOURCES OF CONTAMINATION 1375
7.2 RELEASE MECHANISMS 1375
7.3 IMPACTED MEDIA 1375
7.4 MIGRATION PATHWAYS 1375
7.5 EXPOSURE ROUTES 1375
7.6 POTENTIAL RECEPTORS 1376
7.7 CUMULATIVE RISK ASSESSMENT 1376
7.8 MONITORING WELL NETWORK 1376

8.0 CONCLUSIONS AND RECOMMENDATIONS 1376
8.1 CONCLUSIONS 1376
8.2 RECOMMENDATION 1376
9.0 REFERENCES 1377

TABLES

Table

3-1 Soil Treatment and Removal Plan
4-1 Site Investigation Data
4-2 Treatability Study Data
4-3 Post-Treatment Waste Designation Data
4-4 Final Confirmation Sample Data
4-5 Clean Backfill Characterization Sample Data
6-1 Fixed-Laboratory Data Quality Checklist

FIGURES

Figure

1-1 St. Paul Island Vicinity Map
1-2 Site Location Map
1-3 Lead-Contaminated Soil Study Area – Duplex
1-4 Lead-Contaminated Soil Study Area – Teacher House 101
1-5 Lead-Contaminated Soil Study Area – Teacher House 103
3-1 Proposed Study Area and Actual Site Investigation Sample Locations - Duplex
3-2 Proposed Study Area and Actual Site Investigation Sample Locations – Teacher House 101
3-3 Proposed Study Area and Actual Site Investigation Sample Locations – Teacher House 103
3-4 Planned Soil Treatment and Removal – Duplex
3-5 Planned Soil Treatment and Removal – Teacher House 101
3-6 Planned Soil Treatment and Removal – Teacher House 103
3-7 Excavation Extent and Confirmation Sample Locations and Results - Duplex
3-8 Excavation Extent and Confirmation Sample Locations and Results – Teacher House 101
3-9 Excavation Extent and Confirmation Sample Locations and Results – Teacher House 103
3-10 Waste Disposal Haul Route and Location
3-11 Clean Backfill Borrow Area Haul Route and Sample Locations
3-12 Glass Bottles Encountered Along Teacher House 101 Foundation

APPENDICES

A NOAA and PSI Personnel Qualifications
B Photographic Documentation
C Daily Reports and Logbook Notes
D In-Situ FPXRF Data
E Fixed-Laboratory Data
F ADEC Approval for Corrective Action Report and Conditional Closure Request

ACRONYMS AND ABBREVIATIONS

%	Percent
±	Plus or minus
18 AAC	Title 18 Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
bgs	Below ground surface
BSE	Bering Sea Eccotech, Inc.
CAP	Corrective action plan
CIH	Certified industrial hygienist
cm	Centimeter
yd^3	Cubic yard
EHS	EHS Alaska
EPA	U.S. Environmental Protection Agency
F&BI	Friedman & Bruya, Inc.
FPXRF	Field-portable x-ray fluorescence meter
ft	Foot
ft^2	Square feet
GPS	Global positioning system
HEPA	High-efficiency particulate air filtration
ICP/MS	Inductively coupled plasma/mass spectroscopy
LBP	Lead-based paint
mg/kg	Milligram per kilogram
mg/L	Milligram per liter
MT2	Metals Treatment Technologies, Limited Liability Corporation
NOAA	National Oceanic and Atmospheric Administration
PCS	Petroleum-contaminated soil
P.E.	Professional Engineer
PSI	PSI Environmental and Instrumentation
QA/QC	Quality assurance and quality control
RCRA	Resource Conservation and Recovery Act
R.G.	Registered Geologist
SGS	SGS Environmental Services Inc.
TCLP	Toxicity Characteristic Leaching Procedure
TDX	Tanadgusix Corporation
Tetra Tech	Tetra Tech EM Inc.
TOPA	Transfer of Property Agreement
TPA	Two-Party Agreement
UST	Underground storage tank

EXECUTIVE SUMMARY

This corrective action report/conditional closure request was prepared by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) to detail corrective actions conducted at the Lead Contaminated Soils Site (NOAA Site 60/Non-Two-Party Agreement Site) on St. Paul Island, Alaska. Activities associated with this site were conducted during the 2006 field season.

The corrective actions occurred along and immediately adjacent the roof drip lines of teacher houses 101 and 103, and duplex 108/109 in St. Paul Village on St. Paul Island, Alaska. These three buildings were abated for lead-based paint and asbestos in the fall of 2006. The lead contaminated soil removal discussed in this document is integral to preventing lead-contaminated soil and dust from potentially recontaminating the abated building interiors. The buildings and lands involved with this corrective action are property of the U.S. government.

NOAA selected Bering Sea Eccotech (BSE) as its contractor to assist in implementing the corrective action plan (CAP) for the treatment, removal, and disposal of lead-contaminated soil. BSE subcontracted with PSI Environmental and Instrumentation (PSI) to direct BSE's treatment, removal, and disposal of lead-contaminated soil, as well as to perform third-party sampling. NOAA and PSI utilized one or more "qualified person" as defined in 18 Alaska Administrative Code (AAC) 75.990(100) and 18 AAC 78.995(118) during CAP implementation.

Consistent with the CAP, the study area for the site was defined as soil surrounding the teacher houses and duplex from ground surface to a maximum of two feet below ground surface, as appropriate, and from the building foundations to six feet horizontally away from the building foundations. NOAA performed site characterization, preliminary waste designation and in-situ treatability testing from June 2006 to September 2006 to finalize site treatment and removal planning. During corrective action activities in October 2006, BSE treated a total of approximately 80 cubic yards of soil in-situ using a phosphate-based soil additive; removed approximately 84 cubic yards of contaminated soil (treated and untreated) from the site; and transported the contaminated soil to NOAA's Landfill Cell C at Tract 42 for disposal by landfilling.

BSE treated, excavated, and disposed of site contaminated soil consistent with the CAP to the extent practicable. Buried utilities and other obstructions prevented further lead soil removal at the northwestern portions of both teacher houses, and along the southern portion of teacher house 103. Analytical data for confirmation samples collected from the bottoms of the excavations indicate that lead soil exceeding the ADEC residential cleanup level of 400 milligrams per kilogram remains at the southeast portion of the duplex. However, this contamination is deeper than two feet below ground surface and thus requires no treatment or removal. NOAA placed permeable landscaping fabric atop the remaining duplex contamination prior to backfilling.

Because the primary sources of contamination have been removed and lead-contaminated soil has been excavated to the maximum extent possible, NOAA requests a conditional closure determination from ADEC at the Lead Contaminated Soil Site.

1.0 INTRODUCTION

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), Pribilof Project Office is responsible for site characterization and restoration on St. Paul Island, Alaska, located in the Bering Sea, approximately 800 miles west-southwest of Anchorage, Alaska (Figure 1-1). Public Law 104-91 of 1996 and Public Law 106-562 of 2000 provide the mandate for NOAA's activities. A Two Party Agreement (TPA), signed in 1996 by NOAA and the State of Alaska, provides the framework for corrective action on St. Paul Island (NOAA 1996), and the State of Alaska provides TPA oversight through its Department of Environmental Conservation (ADEC). The Lead Contaminated Soils Site, also known as NOAA Site 60, is not a TPA site. Nevertheless, during the corrective action documented herein, NOAA adhered to the tenets of the TPA. Accordingly, NOAA complied with the State of Alaska regulations for contaminated sites dated October 16, 2005 (ADEC 2005).

The Lead Contaminated Soils Site is comprised of three non-contiguous areas located along and immediately adjacent the roof drip lines of teacher houses 101 and 103 and duplex 108/109 in the City of St. Paul, Alaska (Fig-

ure 1-2). The three buildings and lands within the site are property of the U.S. government. NOAA abated these buildings for lead-based paint (LBP) and asbestos in the fall of 2006. Corrective action to remove lead contaminated soil was integral to preventing lead-contaminated soil and dust from recontaminating the abated buildings' interiors.

The objective of the corrective action was the removal of lead-contaminated soil located within 6 lateral feet (ft) of each of the three buildings' foundations, between the ground surface and a depth of up to 2 ft as appropriate due to the presence of contamination (Figures 1-3, 1-4, and 1-5; NOAA 2006a). This area is referred to as the "Lead-Contaminated Soil Study Area." Lead-contaminated soil is defined as soil that exceeds the ADEC residential land use cleanup level of 400 milligrams per kilogram (mg/kg) total lead (note 11 to Tables B1 and B2 of 18 AAC 75.341 [ADEC 2005]).

NOAA, with its contractor, Bering Sea Eccotech (BSE), implemented a corrective action plan (CAP [NOAA 2006a]) for the characterization, treatment, removal, and disposal of lead-contaminated soil associated with this site. BSE subcontracted with PSI Environmental and Instrumentation (PSI) to direct BSE's treatment, removal, and disposal of lead-contaminated soil. PSI also performed third-party sampling of the treated soil, excavation bottoms, and clean backfill. The corrective action activities were completed under the oversight of NOAA or PSI personnel in accordance with the CAP (NOAA 2006a), the TPA, and State of Alaska regulations and guidance. PSI's Keith Guyer, a registered geologist (R.G.), performed all final confirmation and clean backfill sampling. NOAA's Gregory Gervais, a professional engineer (P.E.), was the primary author for this report. Appendix A contains the Qualified Personnel Form and associated resumes for PSI and NOAA staff.

Except as noted in this corrective action report/conditional closure request, field activities for this investigation were carried out in accordance with the CAP (NOAA 2006a).

2.0 SITE DESCRIPTION

The following subsections provide a description of the site background, site geology, site hydrogeology, and previous investigations for the site.

2.1 SITE BACKGROUND

The Lead Contaminated Soils Site includes soil adjacent to teacher houses 101 and 103 on the southeastern portion of Village Hill, as well as duplex 108/109 east of Village Hill along Sandy Lane (Figure 1-2). The legal descriptions and geographic coordinates for each affected property are:

- Duplex:
  - Legal Description: Section 25 of T35S-R132W; Lot 4: Block 20; 0.32 Acres; 1976 MOU: Parcel 6f; 1984 Transfer of Property Agreement (TOPA): Site 9.
  - Coordinates: 57°07'20.52" north latitude, 170°16'37.77" west longitude
- Teacher House 101:
  - Legal Description: Section 25 of T35S-R132W; Lot 1: Block 9; 0.13 Acres; 1976 MOU: Parcel 6b; 1984 Transfer of Property Agreement (TOPA): Site 9.
  - Coordinates: 57°07'20.52" north latitude, 170°16'37.77" west longitude
- Teacher House 103:
  - Legal Description: Section 25 of T35S-R132W; Lot 3: Block 9; 0.17 Acres; 1976 MOU: Parcel 6b; 1984 Transfer of Property Agreement (TOPA): Site 9.
  - Coordinates: 57°07'20.52" north latitude, 170°16'37.77" west longitude

The two teacher houses were constructed in 1924 as single-family residences, while the duplex was constructed in the late-1950s as multi-family housing. Teacher house 101 is unoccupied and currently uninhabitable due to the

extensive removal of interior finish features during the 2006 abatement. Teacher house 103 and the duplex were also abated in 2006 and are inhabitable.

2.2 SITE GEOLOGY

St. Paul Island was formed as a result of volcanic eruptions of basaltic lavas onto the southern edge of the Bering Sea Shelf. The island has never been glaciated, and many cinder cones with steep slopes and sharp crater rims are present on the island. The island soil is characterized as primarily volcanic deposits consisting of scoria of varying sizes (pebbles to cobbles) and colors (lenses of gray, red, and black) with fractured basalt occurring at depth (Barth 1956).

Soils in the vicinity of the duplex generally consist of sand to approximately 20 ft below ground surface (bgs), while soils in the vicinity of teacher houses 101 and 103 generally consist of scoria deposits to approximately 70 ft bgs (CESI 2001).

2.3 SITE HYDROGEOLOGY

Groundwater in the vicinity of the duplex is present at approximately 10 ft bgs in an unconfined aquifer and generally flows to the north, toward Village Cove (Mitretek 2005). Groundwater in the vicinity of teacher houses 101 and 103 is present at approximately 80 ft bgs in an unconfined aquifer and generally flows southwest toward the Bering Sea (Mitretek 2005). Based on analyses of existing data, groundwater beneath the City of St. Paul is considered brackish and, therefore, not potable (ADEC 2002a, Mitretek 2002). Currently, groundwater in these areas is not used for drinking water, and the groundwater is not expected for potable use in the future. The State of Alaska Department of Natural Resources designated groundwater beneath a portion of the City, including the duplex location, as a Critical Water Management Area (CWMA). This CWMA legally restricts the use of water wells to prevent the migration of petroleum-related contamination to uncontaminated areas (ADNR 2006).

2.4 PREVIOUS INVESTIGATIONS AND CORRECTIVE ACTIONS

NOAA performed corrective actions associated with leaking underground storage tanks (USTs) and petroleum-contaminated soil (PCS) at these building locations in 2002 and 2003. NOAA identified the UST/PCS sites as Tract A Lot 101 (NOAA Site 53 - TPA Site 9q); Tract A Lot 103 (NOAA Site 55 – TPA Site 9s); and E-Shop/Radio Building and Duplex (NOAA Site 24 – TPA Site 9i). Corrective action reports for each of the UST/PCS sites detail the corrective actions taken at the sites (NOAA 2004a, 2004b; Tetra Tech 2005a). Lead-contaminated soil was found at 4 ft bgs during the 2003 confirmation sampling at TPA Site 9i. The contamination, however, was located closer to the e-shop building than the adjacent duplex. In 2004, NOAA performed additional surface soil sampling near this location, but did not find lead at levels exceeding ADEC's residential soil cleanup level of 400 mg/kg (Tetra Tech 2005a). The two teacher houses received conditional closures from ADEC in October 2004, and the duplex received ADEC's conditional closure in February 2005 (NOAA 2004c, 2004d, 2005a).

Teacher house 103's exterior consisted of LBP covering a cementitious skim coating atop poured concrete walls in 2005. Teacher house 103 also had LBP painted fascia boards and soffits. The house's exterior was purportedly repainted in 2002, so that intact non-LBP covered underlying layers of LBP. Peeling LBP may have been disturbed and dislodged to the ground surface during painting preparatory work (NOAA 2005b).

Teacher house 101's exterior is similar to teacher house 103; however, T-111 wood siding and unpainted plywood cover the LBP-painted skim coating. In 2005, teacher house 101 had peeling LBP on its windows, window sills, and window frames (NOAA 2005c).

In 2005, the duplex's exterior consisted of painted cedar shake shingle siding, painted wood window frames and sills, fascia boards, and soffits (NOAA 2005d). The house's exterior was purportedly repainted during the summer of 2005, so that intact non-LBP covered underlying layers of LBP. Peeling LBP was disturbed and dislodged to the ground surface during painting preparatory work.

NOAA identified LBP hazards associated with the teacher houses and duplex during May 2005 building inspections. At that time, NOAA analyzed composite soil samples for lead using its field-portable x-ray fluorescence

meter (FPXRF), and identified potentially lead-contaminated surface soil Additional details from NOAA's building inspections are documented in three phase I environmental site assessment reports (NOAA 2005b, 2005c, 2005d).

NOAA performed building risk assessments at the teacher houses and duplex during the fall of 2005. The risk assessments included the sampling and fixed-laboratory analysis of multiple discrete surface soil and paint chip samples collected along the drip lines of the buildings. Samples representing the soil at and immediately adjacent these buildings' drip lines exceeded 400 mg/kg (EHS 2005). Based on these analytical results, NOAA and ADEC agreed to establish NOAA Site 60, Lead Contaminated Soils Site.

NOAA subsequently composited the soil/paint chip samples at each building and analyzed the samples for leachable lead by the U.S. Environmental Protection Agency's (EPA's) Toxicity Characteristic Leaching Procedure (TCLP). The composite sample representing the surface soil contamination at teacher house 101 did not exceed EPA's leachable lead regulatory limit of 5.0 milligrams per liter (mg/L) for waste disposal, meaning the contaminated soil is not a characteristic hazardous waste (EHS 2006) and can be land disposed in an ADEC-permitted solid waste facility on St. Paul Island. The composite samples representing the surface soil contamination at teacher house 103 and the duplex both exceeded 5.0 mg/L (EHS 2006), meaning the contaminated soil is a characteristic hazardous waste. As such, it would require treatment and disposal at an off-island EPA-permitted Resource Conservation and Recovery Act (RCRA) Subtitle C hazardous waste landfill unless an in-situ treatment approach could reduce the lead leachability to acceptable levels [see Section 3.3 below] prior to disposal.

NOAA performed abatement actions at the buildings in the fall of 2006. At teacher house 103, NOAA removed the LBP-painted fascia boards, removed loose LBP from soffits, enclosed remaining soffit LBP with wood, and encapsulated LBP on the skim coating using an encapsulating paint formulation. At teacher house 101, NOAA removed LBP painted windows, window sills, window frames, and fascia boards. NOAA also removed loose LBP from soffits and enclosed the remaining soffit LBP with wood. At the duplex, NOAA removed LBP siding, window systems, fascia, and soffits. No LBP remains on the duplex structure.

NOAA contractors conducted quarterly groundwater monitoring from June 2000 to September 2001 and from October 2003 to July 2004 at approximately 38 monitoring wells in St. Paul Village. Several of these wells represent groundwater conditions near the teacher houses and the duplex. None of the wells contained lead contamination exceeding ADEC's Table C groundwater cleanup level of 15 mg/L (ADEC 2005, IT Alaska 2002, Tetra Tech 2005b).

3.0 FIELD ACTIVITIES

The primary objective of the corrective action was to remove lead-contaminated soil exceeding the ADEC residential land use cleanup level of 400 mg/kg from the Lead-Contaminated Soil Study Area, consistent with note 11 to Tables B1 and B2 of 18 AAC 75.341 (ADEC 2005). The following subsections summarize the equipment used and the activities performed during this corrective action. Appendix B provides photographic documentation of the corrective action. Appendix C provides copies of the BSE's daily reports, as well as NOAA's and PSI's logbook notes generated during the corrective action.

3.1 CONTRACTORS AND EQUIPMENT

NOAA contracted with BSE to perform site investigation and corrective action activities. BSE provided personnel and equipment necessary to implement the CAP requirements related to soil treatment, soil removal, soil disposal, and site restoration. BSE subcontracted PSI to provide overall site management and engineering services during soil treatment and excavation activities, and the collection of screening and confirmation samples during implementation of the soil treatment and removal activities. NOAA's Nir Barnea, certified industrial hygienist (CIH), James Wright, P.E., and Greg Gervais, P.E. performed all site characterization and treatability study sampling. PSI's Keith Guyer, R.G. performed all final confirmation and clean backfill sampling. NOAA furnished several pieces of government-owned equipment for use during the corrective action. NOAA representatives performed FPXRF analyses of screening samples and provided survey support using real-time kinematic global

positioning system (GPS) techniques and equipment. Appendix A contains the Qualified Personnel Form and associated resumes for PSI and NOAA staff. Debriefing and planning meetings were conducted between NOAA, BSE, and PSI site leaders before the commencement of each day's activities.

Laboratory analytical services were subcontracted to Friedman & Bruya, Inc. (F&BI [Seattle, Washington]), and SGS Environmental Services Inc. (SGS [Anchorage, Alaska]).

Equipment used on site during field activities included the following:

- Hitachi EX150 Excavator (BSE)
- Case 580 Backhoe (BSE)
- Caterpillar 416 D Backhoe (NOAA)
- Bobcat A300 (NOAA)
- Volvo L70 Loader (BSE)
- Caterpillar 966D Loader (BSE)
- Ford 9000D Flatbed Truck (BSE)
- International Dump Truck (BSE)
- Kenworth Dump Truck (BSE)
- Ford Dump Truck (BSE)
- Trimble Total Station 5700 GPS (NOAA)
- Niton 702Xlp FPXRF (NOAA)
- Troy-Bilt 6 horsepower rotary tiller (NOAA)

3.2 SITE INVESTIGATION ACTIVITIES

Before sampling activities were initiated, representatives of the City of St. Paul, Tanadgusix Corporation (TDX), and Alaska Communications Systems identified known utility lines in the vicinity of areas proposed for subsurface sampling (Figures 3-1 through 3-3). Between June 5 and June 8, 2006, and again on August 6, 2006, NOAA excavated test pits or manually advanced direct-push soil borings at 38 locations (16 at the duplex, 10 at teacher house 101, and 12 at teacher house 103). Each location represents a study sub-area measuring approximately 125 square ft (ft^2) of surface area. NOAA attempted to remove visible paint chips at each test pit or boring location prior to advancement. However, paint chip removal by high-efficiency particulate air filtration (HEPA) vacuum was determined impracticable as the mass of soil removed greatly exceeded the mass of paint chips removed. Consequently, NOAA decided that visible paint chips would be removed with contaminated soil during excavation activities.

NOAA collected samples at up to five depth intervals in each subarea, intending to characterize contamination in the following strata: surface, 0.0 to 0.5 ft bgs, 0.5 to 1.0 ft bgs, 1.0 to 1.5 ft bgs, and 1.5 to 2.0 ft bgs. NOAA collected 173 characterization samples for analysis by FPXRF and a fixed laboratory. Soil samples were collected into new, resealable plastic bags using disposable direct-push acetate sleeves, decontaminated gardening trowels, and/or Nitrile gloves. Samples were homogenized thoroughly inside the bags. Each bag was numbered uniquely and shipped to NOAA in Seattle. A total of 165 samples (plus 23 laboratory quality control duplicate samples) were analyzed by NOAA with its FPXRF. The remaining eight samples were sent to F&BI for fixed-laboratory analysis by EPA Method 200.8 (Inductively Coupled Plasma/Mass Spectroscopy [ICP/MS]). Although the CAP (NOAA 2006a) indicated EPA Method SW-846 6020 (ICP/MS) would be used for all fixed-laboratory lead analyses, NOAA approved F&BI's request to use this alternative EPA method based on the laboratory's proficiency with it as well as the method's comparable data quality and defensibility.

Consistent with the CAP (NOAA 2006a), NOAA collected duplicate aliquots of 19 characterization samples for fixed-laboratory quality assurance analysis by EPA Method 200.8 to verify NOAA's 165 FPXRF results. NOAA also used the characterization samples to create 11 representative composite samples to determine the volume of

contaminated soil that would be a characteristic hazardous waste upon excavation. Additionally, NOAA sent an aliquot of the LBP paint chip/soil mixture in the HEPA vacuum's bag to determine whether it was a characteristic hazardous waste. The latter 12 samples were prepared for hazardous waste characterization using EPA Method SW-846 1311 (TCLP) to generate leachate, which was then analyzed for lead by EPA Method 200.8.

Based on the site investigation results, NOAA estimated 68 cubic yards (yd^3) of soil in the study area exceeded the residential soil cleanup level for lead. Additionally, NOAA estimated that 64 of the 68 yd^3 would be a characteristic hazardous waste upon excavation and would require treatment and disposal at a RCRA-permitted hazardous waste facility. These characterization data are interpreted as shown on Figures 3-4 through 3-6, as well as Table 3-1.

3.3 SOIL TREATABILITY STUDY AND REGULATOR COORDINATION ACTIVITIES

Based on 10 of 11 contaminated soil samples from site investigation activities exceeding the RCRA limit of 5 mg/L leachable lead, NOAA performed a treatability study to determine whether Ecobond, a commercially-available phosphate-based soil additive sold by Metals Treatment Technologies, Limited Liability Corporation (MT2), could render lead in the soil unleachable. If the Ecobond could render the lead in the soil unleachable, the contaminated soil would be considered a solid waste rather than a characteristic hazardous waste, allowing it to be land disposed in an ADEC-permitted solid waste facility on St. Paul Island. The treatability test was not described in the site CAP (NOAA 2006a) as NOAA did not determine the need to treat contaminated soil until the site investigation concluded.

NOAA collected two representative soil samples from two discrete locations in the study area, with approximately 2 pounds of soil from each location placed into a resealable plastic bag using disposable Nitrile gloves. Each sample was homogenized; then one aliquot of each sample was sent to MT2 for its own treatablity testing. MT2 found the two aliquots contained leachable lead exceeding the RCRA characteristic hazardous waste threshold prior to treatment. MT2 then mixed Ecobond with the aliquots at a rate of 2 percent (%) by mass. Post-treatment testing by MT2 indicated the lead leachability of each aliquot reduced to nearly undetectable concentrations and below 5 mg/L, rendering the waste non-hazardous. MT2 sent a sample of Ecobond to NOAA for its independent evaluation.

NOAA provided one aliquot of each untreated sample to F&BI to determine the baseline leachability of the study samples prior to treatment. The laboratory determined the total lead in each sample was 999 and 2,630 mg/kg, respectively. NOAA then mixed Ecobond into each sample at rate of 2% by mass, and sent aliquots to F&BI for analysis. The laboratory found leachable lead in the treated samples was below the laboratory practical quantitation limit of 1.0 mg/L.

NOAA coordinated with ADEC and EPA Region 10 regarding the treatability study and approval to treat lead-contaminated soil in-situ without obtaining an EPA Treatment, Storage, and Disposal Facility permit (NOAA 2006b). Both ADEC and EPA concurred that NOAA could proceed with in-situ treatment of lead-contaminated soil without obtaining additional permits. NOAA agreed that, after Ecobond in-situ treatment of soil in the 0.0 to 0.5 ft depth interval, it would collect six representative samples to verify the soil's lead leachability did not exceed 5.0 mg/L. Following verification, NOAA would treat and excavate the remaining soil.

Based on the site characterization and soil treatability study results, NOAA prepared soil treatment and excavation maps and a table to guide the treatment, testing, and removal of contaminated soil at the site (Figure 3-4 through 3-6, Table 3-1). While ADEC and EPA Region 10 verbally concurred with treating soil at a 2% by mass rate, NOAA instead proposed treating soil at 3% instead to reduce the potential for mix heterogeneity causing in-situ post-treatment waste designation samples to "fail" the leachability testing (NOAA 2006b).

3.4 SOIL TREATMENT AND EXCAVATION ACTIVITIES

Soil treatment, excavation, confirmation and waste designation sampling, and site backfill and restoration activities were conducted at the site between October 14, 2006 and October 25, 2006.

Before treatment and excavation activities were initiated, representatives of the City of St. Paul, TDX, and Alaska Communications Systems identified known utility lines in the vicinity of areas proposed for excavation. Utility identification services also were requested and conducted at various times throughout the corrective action when unknown lines were discovered. Areas of treatment and excavation were based on the maps prepared after the site investigation and treatability testing (Figures 3-4 through 3-6), as well as visual observations (e.g., visible paint chips) and in-situ field screening using NOAA's FPXRF.

Soil treatment was initiated for the contaminated 0.0 to 0.5 ft depth intervals at the three buildings. NOAA and BSE determined by experimentation that NOAA's rotary tiller was capable of tilling the surface grass into the soil, eliminating the need to separately remove the grass. Additionally, since the grass generally contained visible paint chips, tilling the grass into the soil would allow these paint chips to be treated along with the soil. BSE applied Ecobond to the ground surface, then mixed the Ecobond with the soil and surface grass using a minimum of two passes with the rotary tiller. NOAA determined in the field that using a mix rate of 2% (the treatability study mix rate) was more prudent than the planned 3% because NOAA had a limited amount of Ecobond on the island and wanted to reserve a significant quantity for potential re-treatment of hot spots.

PSI collected two waste designation samples from the treated soil and grass at each building, for a total of six designation samples (plus one blind duplicate sample), consistent with NOAA's soil treatment plan (NOAA 2006b). Based on fixed-laboratory TCLP results for leachable lead, the in-situ treatment was determined to be fully successful in removing the hazardous characteristic from the soil and grass.

BSE, under PSI's technical direction, removed the treated 0.0 to 0.5 ft bgs soil and grass using BSE's and NOAA's backhoes. BSE's backhoe initially loaded the treated soil directly into its dump trucks at the duplex. BSE found that the following aspects of the process limited the soil removal rate:

(1) treating and removing soil in 0.5 ft thick intervals though the soil contamination extended as deep as 2.0 ft bgs; and

(2) loading contaminated soil directly into dump trucks instead of temporarily stockpiling excavated soil, then loading in larger batches.

The slow removal production rates were due to poor hydraulic controls on BSE's backhoe and limited space available for staging the dump trucks for loading because of the close proximity to buildings, other obstructions (e.g., heating oil aboveground storage tanks, fences), and close proximity to other BSE personnel and equipment performing building abatement work. BSE, PSI, and NOAA thus modified the soil treatment and removal approach cited in the project planning documents (NOAA 2006a, 2006b) in the following two ways:

(1) mixing Ecobond into the soil for the full vertical treatment beginning at 0.5 ft bgs using the backhoe bucket, combining the treatment and excavating actions into one function; and

(2) staging excavated soil into nine temporary stockpiles and periodically loading the piles into dump trucks to reduce the waiting time for the trucks and the number of times the operator had to reposition the backhoe.

NOAA personnel determined that the use of the backhoe to mix Ecobond into the soil provided an adequate level of mixing based on the backhoe's visually and mechanically similar distribution of Ecobond in the soil compared with the rotary tiller. NOAA, BSE, and PSI also decided to leave the temporary stockpiles unlined given the short duration of stockpiling, the limited mobility of lead in soil, NOAA's ability to use its FPXRF to evaluate stockpile footprints for potential lead cross-contamination, and NOAA's willingness to remove cross-contaminated surface soil.

The "planned" in-situ treatment method was used on all 0.0 to 0.5 ft bgs soil at all three buildings; the backhoe mixing in-situ treatment method was used for the remaining treated soil at all three buildings once the 0.0 to 0.5 ft bgs soil was removed. The "planned" removal and loading method was used on the first two dump truck loads at the duplex for soil 0.0 to 0.5 ft bgs. The temporary stockpiling method was employed for the remaining soil at all three buildings. Stockpiles were periodically loaded into BSE dump trucks. NOAA, BSE, and PSI personnel frequently excavated contaminated soil with hand shovels in areas with visible paint chips and where FPXRF screening indicated hot spots remained.

NOAA and its contractors followed NOAA's planned treatment and excavation location plan (Table 3-1; Figures 3-4 through 3-6) with the exceptions listed below.

(1) Duplex: buried utilities prevented further excavation in several locations:

   a. potable water main vault in subarea 1a

   b. potable water shutoff valve box in subareas 2a and 2b

   c. electrical lines in subarea 3b

Note that the potable water main vault and shutoff valve box did not prevent NOAA from removing contaminated soil. The surface soil covering the concrete vault was removed, and the vertical extent of the vault and valve box exceeded the ADEC point of compliance depth of 2 ft bgs for this site.

(2) Duplex: BSE treated and excavated most of subarea 2a to a depth of 2.5 ft bgs (planned excavation to 2.0 ft bgs) to aid with site grading to direct runoff away from the building foundation.

(3) Duplex: BSE excavated subarea 7a to a depth of 1.5 ft bgs (planned excavation to 1.0 ft bgs) because NOAA's in-situ FPXRF screening during treatment and excavation activities indicated contamination extended deeper than anticipated.

(4) Duplex: BSE removed surface soil in part of subarea 6a (no excavation planned) due to the presence of visible paint chips that had fallen from LBP-painted tin found beneath the building siding and removed during abatement activities.

(5) Teacher House 101: buried telephone lines prevented further excavation in subareas 1a, 2a and 2b.

(6) Teacher House 101:

   a. BSE treated and excavated most of subarea 1a to a depth of 2.5 ft bgs (planned excavation to 1.0 ft bgs) because NOAA's in-situ FPXRF screening indicated contamination extended deeper than anticipated. Additionally, the deeper excavation aided with site grading to direct runoff away from the building foundation.

   b. BSE treated and excavated the eastern three-quarters of subarea 3a to a depth of 2.0 ft bgs (planned excavation to 1.0 ft bgs) because NOAA's in-situ FPXRF screening indicated contamination extended deeper than anticipated. The western one-quarter of this subarea could only be treated and excavated to approximately 0.5 ft bgs due to buried telephone lines.

(7) Teacher House 103: buried utilities and other obstructions prevented further excavation in several locations:

   a. cable television trunk line in subareas 3a and 3b

   b. heating oil aboveground storage tank in subarea 6b

(8) Teacher House 103: BSE treated and excavated most of subarea 5a to a depth of 3.0 ft bgs (planned excavation to 2.0 ft bgs) because NOAA's in-situ FPXRF screening indicated contamination extended deeper than anticipated.

(9) Teacher House 103: BSE treated and excavated most of subarea 6a to a depth of 2.0 ft bgs (planned excavation to 1.0 ft bgs) because NOAA's in-situ FPXRF screening indicated contamination extended deeper than anticipated.

PSI collected 13 confirmation samples from the bottom of the excavations for fixed-laboratory analysis for total lead (Figures 3-7 through 3-9).

Although a soil sample collected from the excavation bottom at duplex subarea 8a indicated that lead remains above the ADEC residential cleanup level, the contamination resides deeper than 2.0 ft bgs (Figure 3-7). Consistent with the ADEC-approved CAP (NOAA 2006a), this soil does not require removal as the point of compliance for this contaminant is 0.0 to 2.0 ft bgs. NOAA placed a permeable, visible barrier at the bottom of the excavation where lead contamination remained. NOAA intends to include notification of the presence of this contamination in NOAA's parcel 6f (including the duplex) quitclaim deed.

NOAA excavated an estimated total of 84 yd^3 of lead-contaminated soil from this site, including 29 yd^3 at the duplex, 33 yd^3 at teacher house 101, and 22 yd^3 at teacher house 103. This exceeded the 68 yd^3 of soil identified during NOAA's site investigation as requiring removal. BSE treated 80 yd^3 of the estimated 84 yd^3 of removed soil. This exceeded the 64 yd^3 identified during NOAA site investigation as requiring treatment. NOAA treated and removed the additional 16 yd^3 due to in-situ FPXRF results. As indicated in Section 3.2, 4 yd^3 of soil was previously characterized as a non-hazardous waste and required no treatment prior to removal (Figure 3-3). The treated soil weighed about 292,000 pounds based on an assumed in-situ density of 3,645 pounds per yd^3 (NOAA 2006b). NOAA used approximately 6,000 pounds of Ecobond in treating this soil, for an average application rate of 2.06% by mass. Additionally, BSE removed an estimated 40 yd^3 of clean soil during drainage re-grading activities around the three buildings.

3.5 DISPOSAL

BSE transported an estimated 80 yd^3 of treated lead-contaminated soil, 4 yd^3 of untreated lead-contaminated soil, and 40 yd^3 of clean soil from regrading activities to NOAA-owned Tract 42. There BSE excavated four disposal trenches into the landfill's cell C closure cap and landfilled the soil. BSE performed decontamination of NOAA and BSE earthmoving equipment at a disposal trench in landfill cell C using a cold water pressure washer. BSE disposed of the decontamination water by allowing it to run into a disposal trench that contained Ecobond-treated soil. Approximately four other disposal trenches in the same area of landfill cell C were excavated by BSE for disposing of solid waste and construction and demolition debris waste generated from building abatement and roofing activities BSE performed under contract with NOAA. Most disposal trenches received both contaminated soil and building abatement and roofing waste. BSE used the trench excavation soil to cover the disposal trenches consistent with the CAP (NOAA 2006a). Figure 3-10 shows the disposal trench area.

3.6 BACKFILLING AND SITE RESTORATION

Each excavation was backfilled after FPXRF screening sample analyses indicated total lead concentrations below the ADEC cleanup level, and after fixed-laboratory confirmation samples had been collected. If remaining contamination was suspected but further excavation was prevented by the presence of groundwater or obstructions, backfill was also placed after fixed-laboratory confirmation samples had been collected. Backfill operations involved transporting clean fill material in BSE's decontaminated dump trucks from the TDX-owned Lake Hill quarry to the site (Figure 3-11); dumping the material into the excavations; and compacting the fill material with the backhoe or front-end loader bucket. Each area of excavation was restored to a grade intended to direct surface water drainage away from the building foundations.

BSE placed an estimated 70 yd^3 of clean backfill at the site.

3.7 INVESTIGATION-DERIVED WASTE MANAGEMENT

Investigation-derived waste generated during this corrective action included:

Used nitrile sampling gloves, which were placed in trash bags and disposed as municipal solid waste.

Used disposable cleaning wipes, which were placed in trash bags and disposed as municipal solid waste.

Plastic bags, acetate sampling sleeves and glassware, which were emptied of soil and disposed as municipal solid waste.

Reusable sampling equipment decontamination water from the June 2006 site characterization, which was transferred to a plastic bucket and characterized to have total lead exceeding the ADEC Table C groundwater cleanup level of 0.015 mg/L. The bucket will be disposed off-island at a permitted facility along with other IDW accumulated by NOAA during its cleanup activities during building abatement. As necessary, NOAA will provide a certificate of waste disposal for the bucket to ADEC in a separate submittal from this document.

3.8 SITE SURVEYING

NOAA representatives surveyed sampling locations and excavation extents using a survey-grade Trimble Total Station® 5700 differential GPS. The Trimble Total Station® 5700 is a GPS data collection and mapping system that combines a high-performance, dual-channel GPS receiver and antenna with a local base station and real-time differential correction system to provide survey-grade accuracy in real time. Horizontal positions of soil sampling locations and excavation boundaries were determined to within approximately plus or minus (±) 1 centimeter (cm), and elevations were determined to within approximately ± 2 cm. A repeater radio was placed at elevated locations near the site work areas to provide radio transmission from the base station to the site location. Data were collected in latitude and longitude referenced to the World Geodetic System 1984 Datum, Universal Transverse Mercator Zone 2 coordinate system in meters.

At times, the Trimble Total Station® 5700 equipment could not be used to survey the site with cm-level precision as a result of inadequate satellite coverage or a malfunctioning local base station. On these occasions, NOAA used a lower precision GPS surveying approach to approximate the locations with sub-meter accuracy.

3.9 HISTORIC PRESERVATION

BSE encountered seven glass bottles while excavating along the north side of the teacher house 101 foundation in subarea 2a. The bottles were unearthed with a hand shovel in one specific area, approximately 0.5 ft north of the building foundation at approximately 1.5 ft bgs (Figure 3-8). No other articles or broken bottles were located with the bottles. The soil surrounding the bottles was unconsolidated, but not apparently less so than other soil near teacher house 101 at this depth interval. NOAA took possession of these bottles, photographed them (Figure 3-12), then sent a photograph to NOAA's historic preservation lead for the Pribilof Islands, Mr. Bernard Denno. The photograph was subsequently provided to a NOAA contractor with archaeologist credentials, Dr. Charles Mobley, to determine the cultural significance of the bottles. Dr. Mobley suggested that the bottles predate the teacher houses, and that their discovery location may have been an outhouse hole or some other sort of cache. No other potential culturally significant artifacts were encountered during this corrective action.

4.0 FIELD SCREENING AND ANALYTICAL SAMPLING

Throughout corrective action activities, NOAA and PSI collected FPXRF screening and fixed-laboratory definitive data samples in accordance with the CAP (NOAA 2006a) and NOAA's Master Quality Assurance Plan (NOAA 2006c). FPXRF screening sample analyses were performed by NOAA representatives and used by NOAA for excavation planning, as well as by PSI to direct excavation activities and identify locations for analytical confirmation samples. Based on evaluation of the excavation screening sample results, analytical sampling locations were selected where the greatest potential for residual contamination existed.

The following subsections describe the instrumentation used and procedures followed during the collection of FPXRF screening and fixed-laboratory site characterization, waste designation, confirmation, and clean backfill samples. The FPXRF results are discussed in Section 5. Data quality is discussed in Section 6.

4.1 FIELD-PORTABLE X-RAY FLUORESCENCE SCREENING SAMPLES

FPXRF involves the use of x-rays from a depleted radioactive source to cause a fluorescence response from metallic elements during the change of energy bands by electrons, with the response measured by a sensor then compared against standard responses using an on-board computer. ADEC approved the use of the FPXRF for site characterization and excavation screening as part of NOAA's CAP for the site (NOAA 2006a).

NOAA used FPXRF in four different applications.

During site characterization, final confirmation sampling, and clean backfill characterization sampling, NOAA or PSI collected 181 samples into resealable plastic bags, with approximately 250 grams of soil collected per sample. NOAA then homogenized the soil in each bag, and analyzed each sample ex-situ with the FPXRF. The FPXRF results from this application are compared with results from the fixed laboratory to verify FPXRF accuracy.

During excavation activities, NOAA used the FPXRF to rapidly screen soil in-situ at the excavation bottom to determine the presence of localized hot spots requiring additional removal.

NOAA also provided in-situ FPXRF results to PSI as additional information to guide PSI's selection of final confirmation sampling locations.

Finally, NOAA used the FPXRF to verify BSE removed all temporarily stockpiled lead-contaminated soil, with PSI directing additional removal when FPXRF in-situ screening indicated the presence of residual contamination.

Tables 4-1, 4-2, 4-4, and 4-5 provide a summary of FPXRF ex-situ samples collected for the site investigation, confirmation sampling, and clean fill verification sampling. FPXRF samples from excavation in-situ screening are summarized in Appendix D.

4.2 FIXED-LABORATORY SAMPLES

Fixed-laboratory analytical samples were collected according to the following procedures. First, approximately 250 grams of soil was collected from the sampling location and directly placed into a clean, resealable plastic bag and homogenized. For NOAA-collected samples, the homogenized bag was hand delivered to F&BI under chain-of-custody. For PSI-collected samples, an aliquot from the homogenized sample was placed in a 4 ounce jar. PSI then packaged and shipped the sample jars under chain-of-custody to SGS using air cargo and courier services.

Fixed-laboratory total lead analyses were performed using ICP/MS, while leachable lead analyses were performed by first extracting the samples using EPA Method SW-846 1311 (TCLP) then analyzing the leachates using an ICP/MS.

Tables 4-1 through 4-5 provide a summary of fixed-laboratory samples collected for the corrective action.

Site Characterization

NOAA sent 19 site characterization samples collected in June 2006 for fixed-laboratory total lead analysis to verify the accuracy of the 165 FPXRF site characterization analyses. NOAA sent eight site characterization samples collected in August 2006 for fixed-laboratory total lead analysis to fill data gaps identified after the June 2006 site characterization sampling concluded. NOAA sent 12 waste designation samples, composited from samples collected in June 2006, for fixed-laboratory total lead and leachable lead analyses to determine whether site contaminated soil and grass would require treatment as a hazardous waste prior to disposal.

Treatability Study

NOAA sent four treatability study samples for fixed-laboratory total lead and leachable lead analyses to verify MT2's Ecobond testing.

Post-Treatment Waste Designation

PSI sent six in-situ soil treatment samples for fixed-laboratory total lead and leachable lead analyses analysis to determine whether BSE successfully treated the soil to eliminate its hazardous waste characteristic of leachability.

Confirmation Sampling

PSI sent 13 confirmation samples for fixed-laboratory total lead analysis to confirm site excavation removed all soil exceeding the ADEC residential cleanup level at the point of compliance.

Clean Backfill Verification

PSI sent three clean backfill samples for fixed-laboratory total lead analysis to verify the Lake Hill scoria pit as a clean source of backfill material.

5.0 ANALYTICAL RESULTS

The following subsections summarize the analytical results for soil samples collected for this corrective action. Tables 4-1 through 4-5 summarize the FPXRF and fixed-laboratory results for all samples except in-situ FPXRF samples analyzed during excavation activities. Appendix D details all FPXRF results, including in-situ samples

analyzed during excavation activities to guide excavation. Appendix E provides the analytical data packages for project samples analyzed by fixed laboratories.

5.1 SITE CHARACTERIZATION SAMPLES

FPXRF and fixed-laboratory analyses indicated lead concentrations exceeded the ADEC residential cleanup level of 400 mg/kg in 29 of the 38 study area subareas. Sixteen of the 29 contaminated subareas demonstrated elevated lead concentrations to a maximum depth of 0.5 ft bgs. Only 4 of the 29 contaminated subareas demonstrated elevated lead concentrations as deep as 2.0 ft bgs. Total lead analytical results for NOAA's 173 characterization samples ranged from non-detect to 9,936 mg/kg. Only 1 of the 12 waste designation samples collected in June 2006 contained leachable lead below the RCRA characteristic hazardous waste threshold of 5.0 mg/L, and the maximum leachable lead concentration identified was 26.2 mg/L. Figures 3-1 through 3-6 indicate the site characterization sample locations and summarize the characterized extent of contamination and locations of hazardous and non-hazardous waste at the site prior to in-situ treatment and excavation activities. Table 4-1 summarizes these analytical results.

5.2 TREATABILITY STUDY SAMPLES

Fixed-laboratory analyses by NOAA indicated pre-treatment leachable lead concentrations for the two test aliquots were 9.11 and 9.35 mg/L, and post-treatment concentrations (sample aliquots mixed with a 2% by mass quantity of Ecobond) were both less than the laboratory practical quantitation limit of 1.0 mg/L. Table 4-2 summarizes these analytical results.

5.3 POST-TREATMENT WASTE DESIGNATION

Fixed-laboratory analyses indicated none of the six post-treatment waste designation samples contained leachable lead greater than SGS's practical quantitation limit of 0.5 mg/L, which is below the RCRA characteristic hazardous waste threshold of 5.0 mg/L. Table 4-3 summarizes these analytical results.

5.4 EXCAVATION-DIRECTING IN-SITU SAMPLES

In-situ FPXRF analyses aided PSI with determining whether additional soil required removal to meet corrective action objectives. Appendix D details these data by general location and actual time, indicating the progression of removing soil exceeding the ADEC residential cleanup level of 400 mg/kg. As described in Section 3.4, some anticipated soil removal could not be performed due to buried utilities and other obstructions. In some of these instances the Appendix D data show the remaining contaminant levels at these locations based on in-situ FPXRF screening.

5.5 CONFIRMATION SAMPLES

FPXRF and fixed-laboratory analyses indicated lead concentrations exceeded the ADEC residential cleanup level of 400 mg/kg in 1 of the 13 confirmation samples, with a concentration of 1,830 mg/kg in duplex subarea 8a at a depth of 2 ft bgs. Figures 3-7 through 3-9 indicate the confirmation sample locations and summarize the results. Table 4-4 also summarizes the analytical results.

5.6 BACKFILL CHARACTERIZATION SAMPLES

FPXRF and fixed-laboratory analyses indicated lead concentrations were below the ADEC residential cleanup level of 400 mg/kg in all three backfill characterization samples collected from the Lake Hill quarry. Figure 3-11 indicates the backfill characterization sample locations. Table 4-5 summarizes these analytical results.

6.0 QUALITY ASSURANCE AND QUALITY CONTROL

To ensure that information obtained from field and laboratory procedures is an accurate and defensible representation of site conditions, quality assurance and quality control (QA/QC) procedures were implemented. NOAA followed the operational guidelines set forth in the ADEC Environmental Laboratory Data and Quality Assurance Requirements memorandum (ADEC 2006a) as well as those stipulated in the Pribilof Islands site restoration Master Quality Assurance Plan (NOAA 2006c). These documents provide detailed QA/QC information pertaining to each quality control item discussed in this section. Table 6-1 is a completed copy of the ADEC-required Laboratory Data Review Checklist (ADEC 2006b).

Based on the data quality review detailed in Table 6-1, all project chemical data presented in Section 5 met project data quality requirements and are satisfactory for decision-making purposes.

7.0 CONCEPTUAL SITE MODEL

A conceptual site model is used to evaluate exposure pathways for human health and ecological receptors (ADEC 2000). The following subsections provide an evaluation for each of the elements of the conceptual site model for the site including historical contamination sources, release mechanisms, impacted media, migration pathways, exposure routes, potential receptors, and the need for a cumulative risk assessment.

7.1 HISTORICAL SOURCES OF CONTAMINATION

Historical sources of contamination were abated in the fall 2006. NOAA and its contractors removed LBP-painted soffits, fascia, and cedar shake siding, and encapsulated or enclosed the remaining LBP.

7.2 RELEASE MECHANISMS

Potential release mechanisms include paint peeling from exterior building components.

7.3 IMPACTED MEDIA

As a result of releases, lead-contaminated soil was identified during previous investigations. In this 2006 corrective action, approximately 84 yd^3 of lead-contaminated soil were removed to a maximum depth of 3 feet bgs. The contamination remaining at the site above the ADEC residential cleanup level of 400 mg/kg resides at the southeast corner of the duplex building (Figure 3-7). Lead was detected in site groundwater at former monitoring well MWA-8, located south of teacher house 103. The maximum level at this location was 0.0023 mg/L (Tetra Tech 2005b), which is less than the ADEC Table C groundwater cleanup level of 0.015 mg/L.

7.4 MIGRATION PATHWAYS

The majority of lead has been removed from this site, and the source volume has been reduced significantly. The presence of remaining contamination is limited to soil deeper than 2 ft bgs at duplex subarea 8a and inaccessible shallow soil adjacent to buried utilities and other obstructions. Excepting approximately 340 square feet of inaccessible surface contaminated soil at teacher house 101 subarea 2a and teacher house 103 subareas 3a, 3b, and 6b, the site's contaminated surface soil has been removed and no overland transport pathway is available. Vegetation exists at the inaccessible locations, restricting the migration of lead-contaminated soil.

7.5 EXPOSURE ROUTES

Excepting teacher house 101 subarea 2a and teacher house 103 subareas 3a, 3b, and 6b, no direct exposure pathways such as inhalation or ingestion of lead-contaminated soil exist at this site. The native grass root mass will further restrict the inhalation and ingestion exposure routes at these three subareas, presuming future site activities do not damage the root mass or otherwise create new exposure routes. Past groundwater monitoring at the site in-

dicates lead contamination does not exceed ADEC Table C cleanup levels for lead. Given that lead contamination sources have been remediated, and that much of the City of St. Paul is designated as a Critical Water Management Area, prohibiting the use of groundwater, indirect exposure to contaminated groundwater is highly unlikely.

7.6 POTENTIAL RECEPTORS

Because potential exposure routes have been mitigated, and indirect exposure routes are not considered viable given existing site conditions, no potential receptors have been identified.

7.7 CUMULATIVE RISK ASSESSMENT

Cumulative risk is defined as the sum of risks resulting from multiple sources and pathways to which humans are exposed. When more than one hazardous substance is present at a site or multiple exposure pathways exist, the cleanup levels in Table B1 of 18 AAC 75.341 and Table C of 18 AAC 75.345 may need to be adjusted downward. There is only one hazardous substance (lead) at this site. Lead is not included in cumulative risk assessment calculations because it was deemed by ADEC and EPA to be inappropriate to apply a reference dose or cancer slope factor to lead (ADEC 2002b). Therefore, no cumulative risk assessment calculations are appropriate for this site.

7.8 MONITORING WELL NETWORK

No monitoring wells currently exist in the near vicinity of the site. Through 2004, a total of eight monitoring wells were in the vicinity of the site: MW46-13, MW46-17, MW46-18, MW46-19, MW46-20, MW46-26, MWA-7, and MWA-8 (Tetra Tech 2005b). However, lack of groundwater contamination at these locations and the presence of other monitoring wells better located for long-term monitoring allowed NOAA to decommission these wells in 2005 and 2006.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The following subsections present conclusions and recommendations for the Lead Contaminated Soils Site based on field activities performed and analytical findings obtained from corrective action activities conducted during the 2006 field season.

8.1 CONCLUSIONS

During the 2006 field season, approximately 80 yd^3 of lead-contaminated soil about the perimeters of the duplex, teacher house 101, and teacher house 103 were treated in-situ with Ecobond and rendered a non-hazardous waste. After treatment, approximately 84 yd^3 of lead-contaminated soil were removed from the treatment locations and two adjacent subareas that required no treatment. Although soil samples collected from the excavation bottom at the southeast corner of the duplex indicate that concentrations of lead remain above the ADEC residential soil cleanup level, the contamination lies deeper than the ADEC point of compliance ranging from ground surface to 2 ft bgs. In addition, about 340 square feet of inaccessible surface contaminated soil also remains at teacher houses 101 and 103, but further excavation is impracticable due to the presence of the active utility lines and an aboveground storage tank.

Groundwater in the vicinity of the site is not contaminated above the ADEC Table C cleanup level for lead.

8.2 RECOMMENDATION

Because primary sources of contamination have been removed and because the excavation of lead-contaminated soil has been conducted to the maximum extent practicable at the site, NOAA recommends no further action at this site. Prior to property transfer, NOAA will document the remaining contamination in applicable quitclaim deeds informing future landowners and other interested parties of the nature and extent of remaining lead contamination in soil.

In accordance with paragraph 59 of the TPA (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective and closure actions, to the maximum extent practicable, at the Lead Contaminated Soils Site, in accordance with the TPA and that ADEC grant a conditional closure that will not require further remedial action from NOAA. ADEC will/may require additional containment, investigation, or cleanup if subsequent information indicates that the level of contamination that remains does not protect human health, safety, or welfare, or the environment. A conditional closure request and signature blocks are found on the following page.

Request for Conditional Closure
Lead Contaminated Soils Site, NOAA Site 60/Non-Two Party Agreement
St. Paul Island, Alaska

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed to the maximum extent practicable at the Lead Contaminated Soils Site on St. Paul Island in accordance with the Agreement.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

2/7/2007
Date

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

2-16-07
Date

9.0 REFERENCES

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels. Contaminated Sites Program*. July 17, 1991.

ADEC. 2000. *Risk Assessment Procedures Manual*. June 8.

ADEC. 2002a. *Letter from Louis Howard, Project Manager, Alaska Department of Environmental Conservation, to John Lindsay, (NOAA Pribilof Project Office Manager, Regarding ADEC Conditional Approval for Applying the Ten Times Rule*. May 30.

ADEC. 2002b. *Cumulative Risk Guidance*. November 7.

ADEC. 2003. 18 AAC 78. *Underground Storage Tanks*. State of Alaska. Amended through January 30.

ADEC. 2005. Title 18 of the *Alaska Administrative Code* 75, Articles 3 and 9. Oil and Hazardous Substances Pollution Control Regulations. State of Alaska. Amended through October 16, 2005.

ADEC. 2006a. *Technical Memorandum - 06-002. Environmental Laboratory Data and Quality Assurance Requirements*. ADEC Division of Spill Prevention and Response, Contaminated Sites Program. May 18.

ADEC. 2006b. *Laboratory Data Review Checklist*. ADEC Division of Spill Prevention and Response, Contaminated Sites Program. Submitted to NOAA on September 27.

Barth, T.F.W.. 1956. *U.S. Department of the Interior Geological Survey Bulletin 1028-F, Geology and Petrology of the Priblilof Islands, Alaska*.

Columbia Environmental Sciences, Inc. (CESI). 2001. *Draft Site Characterization Report, Tract 46 and Vicinity (TPA Site 9), St. Paul Island, Alaska*. Version 2.1. CESI, Kennewick, WA. December 16.

EHS Alaska (EHS). 2005. EHS-Alaska, Inc. (EHS). 2005. LBP – Risk Assessment and Asbestos Air Monitoring Report, 6 NOAA Properties, St. Paul Island, Alaska. November 15.

EHS. 2006. Lead Bulk Sample Analysis by TCLP. Laboratory Data Report. Final. March 17.

IT Alaska Corporation. 2002. *Draft Annual Groundwater Monitoring Report – 2001, St. Paul Island, Alaska*. March.

Mitretek Systems. 2002. *Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska*. Final. May.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two-Party Agreement, Attorney General's Office File No. 66-1-95-0126*. January 26.

NOAA. 2004a. *UST Removal and Corrective Action Report TPA Site 9-Q – House 101 St. Paul Island, Alaska. February 9.*

NOAA. 2004b. UST Removal and Corrective Action Report TPA Site 9-S – House 103 St. Paul Island, Alaska. February 9.

NOAA. 2004c. *Request for NFRAP, House 101, TPA Site 9q/Site 53*. St. Paul Island, Alaska. September 29

NOAA. 2004d. *Request for NFRAP, House 103, TPA Site 9s/Site 55*. St. Paul Island, Alaska. October 11.

NOAA. 2005a. *Request for Conditional Closure, Duplex Building and E-Shop, TPA Site 9i/Site 24*. St. Paul Island, Alaska. February 1.

NOAA. 2005b. *Phase I Environmental Site Assessment, Teacher House 103*. St. Paul Island, Alaska. October 19.

NOAA. 2005c. *Phase I Environmental Site Assessment, Teacher House 101*. St. Paul Island, Alaska. October 19.

NOAA. 2005d. *Phase I Environmental Site Assessment, Duplex Building*. St. Paul Island, Alaska. October 19.

NOAA 2006a. *Corrective Action Plan for the Removal of Lead Contamination at Teacher Houses 101 and 103, and the Duplex, Lead Contaminated Soils Site (NOAA Site 60/Non-TPA)*. St. Paul Island, Alaska. May 15.

NOAA. 2006b. Memorandum from John Lindsay, NOAA, to Jan Palumbo, EPA Region 10 RCRA Permitting Coordinator, regarding Proposal for in-situ treatment of soil failing TCLP for leachable lead using commercial phosphate additives to render it non-hazardous, followed by disposal in on-island permitted solid waste landfill.. Revised September 29.

NOAA 2006c. *Master Quality Assurance Plan. Pribilof Islands Environmental Restoration Project*. National Oceanic and Atmospheric Administration Pribilof Project Office. March.

Tetra Tech EM Inc. (Tetra Tech). 2005a. *Final Corrective Action Report, Site 24/TPA Site 9i – Duplex Building and Former E-Shop*. St. Paul Island, Alaska. January 7

Tetra Tech. 2005b. *Final Field Investigation Report, St. Paul Island, Alaska*. Pribilof Islands Environmental Restoration Project. St. Paul Island, Alaska. June 23.

U.S. Environmental Protection Agency. 1996. *Test Methods for Evaluating Solid Waste*. EPA/SW-846. Third Edition and Updates. December.

TABLES

Table 3-1. Soil Treatment and Removal Plan

LEGEND		
< 400 mg/kg	>400 mg/kg + Non-HW	>400 mg/kg + HW
C	NHW	HW

Building	Subarea Name	Contaminated Soil Extent (ft^2)	Planned Ecobond per Subarea (lbs.)	Depth: 0-3”	3-6”	6-12”	12-18”	18-24”	Non-HW Volume (yd^3)	HW Volume (yd^3)
Duplex	1a	91	92.1	HW	C	C	C	C	0.0	0.8
	1b	0	0.0	C	C	C	C	C	0.0	0.0
	2a	63	63.8	HW	C	C	C	C	0.0	0.6
	2b	0	0.0	C	C	C	C	C	0.0	0.0
	3a	0	0.0	C	C	C	C	C	0.0	0.0
	3b	83	84.0	HW	C	C	C	C	0.0	0.8
	4a	100	810.0	HW	HW	HW	HW	HW	0.0	7.4
	4b	138	279.5	HW	HW	C	C	C	0.0	2.6
	5a	87	264.3	HW	C	C	HW	C	0.0	2.4
	5b	0	0.0	C	C	C	C	C	0.0	0.0
	6a	0	0.0	C	C	C	C	C	0.0	0.0
	6b	0	0.0	C	C	C	C	C	0.0	0.0
	7a	63	0.0	NHW	NHW	C	C	NHW	2.3	0.0
	7b	75	0.0	C	C	NHW	C	C	1.4	0.0
	8a	82	332.1	C	C	HW	HW	C	0.0	3.0
	8b	0	0.0	C	C	C	C	C	0.0	0.0
	Total	**782**	**1926**						**4**	**18**
TH101	1a	118	239.0	C	C	HW	C	C	0.0	2.2
	1b	0	0.0	C	C	C	C	C	0.0	0.0
	2a	111	449.6	HW	HW	HW	C	C	0.0	4.1
	2b	123	249.1	HW	HW	C	C	C	0.0	2.3
	3a	80	324.0	HW	HW	HW	C	C	0.0	3.0
	3b	90	182.3	HW	HW	C	C	C	0.0	1.7
	4a	0	0.0	C	C	C	C	C	0.0	0.0
	4b	97	196.4	HW	HW	C	C	C	0.0	1.8
	5a	109	441.5	HW	HW	HW	C	C	0.0	4.0
	5b	123	747.2	HW	HW	HW	HW	C	0.0	6.8
	Total	**851**	**2829**						**0**	**26**
TH103	1a	0	0.0	C	C	C	C	C	0.0	0.0
	1b	0	0.0	C	C	C	C	C	0.0	0.0
	2a	77	78.0	HW	C	C	C	C	0.0	0.7
	2b	89	180.2	HW	HW	C	C	C	0.0	1.6
	3a	99	100.2	HW	C	C	C	C	0.0	0.9
	3b	113	228.8	HW	HW	C	C	C	0.0	2.1

Building	Subarea Name	Contaminated Soil Extent (ft^2)	Planned Ecobond per Subarea (lbs.)	Depth: 0-3”	3-6”	6-12”	12-18”	18-24”	Non-HW Volume (yd^3)	HW Volume (yd^3)
	4a	80	324.0	HW	HW	HW	C	C	0.0	3.0
	4b	75	151.9	HW	HW	C	C	C	0.0	1.4
	5a	82	332.1	HW	HW	C	C	HW	0.0	3.0
	5b	79	160.0	HW	HW	C	C	C	0.0	1.5
	6a	109	441.5	HW	HW	HW	C	C	0.0	4.0
	6b	124	251.1	HW	HW	C	C	C	0.0	2.3
	Total	**927**	**2248**						**0**	**21**
Total- 3 Buildings		**2560**	**7002**						**4**	**64**
		Contaminated Soil Extent (ft^2)	**Planned Ecobond (lbs.)**						**Non-HW Volume (yd^3)**	**HW Volume (yd^3)**

Table 4-1. Site Investigation Data

Final Sample ID	DEPTH (ft)	Building Subarea	Sampling Date	Total Lead FPXRF Result[1] (mg/kg)	Total Lead Fixed-Lab Result (mg/kg)	Leachable Lead Fixed-Lab Result (mg/L)	False Negative Result[2] for FPXRF compared with Fixed-Lab Result (Yes/No)
				ADEC Cleanup >400 mg/kg	*ADEC Cleanup >400 mg/kg*	*RCRA Hazardous Waste >5.0 mg/L*	
DUPLEX							
SP60-CH-111-000	0.25	1a	6/7/2006	1,585	na	na	
SP60-CH-111-005	0.50	1a	6/7/2006	189	na	na	
SP60-CH-111-010	1.00	1a	6/7/2006	106	na	na	
SP60-CH-111-015	1.50	1a	6/7/2006	143	na	na	
SP60-CH-111-020	2.00	1a	6/7/2006	87	na	na	
SP60-CH-112-000	0.25	1b	6/7/2006	200	na	na	
SP60-CH-112-005	0.50	1b	6/7/2006	127	na	na	
SP60-CH-112-010	1.00	1b	6/7/2006	147	na	na	
SP60-CH-112-015	1.50	1b	6/7/2006	64	na	na	
SP60-CH-112-020	2.00	1b	6/7/2006	0	na	na	
SP60-CH-117-000	0.25	2a	6/7/2006	1,167	na	na	
SP60-CH-101-005	0.50	2a	6/5/2006	213	241	na	No
SP60-CH-101-010	1.00	2a	6/5/2006	155	143	na	No
SP60-CH-101-015	1.50	2a	6/5/2006	237	na	na	
SP60-CH-101-020	2.00	2a	6/5/2006	249	na	na	
SP60-CH-102-005	0.50	2b	6/5/2006	172	na	na	
SP60-CH-102-010	1.00	2b	6/5/2006	211	na	na	
SP60-CH-102-015	1.50	2b	6/5/2006	233	na	na	
SP60-CH-102-020	2.00	2b	6/5/2006	43	na	na	
SP60-CH-105-005	0.50	3a	6/7/2006	88	na	na	

Final Sample ID	DEPTH (ft)	Building Subarea	Sampling Date	Total Lead FPXRF Result[1] (mg/kg)	Total Lead Fixed-Lab Result (mg/kg)	Leachable Lead Fixed-Lab Result (mg/L)	False Negative Result[2] for FPXRF compared with Fixed-Lab Result (Yes/No)
				ADEC Cleanup >400 mg/kg	*ADEC Cleanup >400 mg/kg*	*RCRA Hazardous Waste >5.0 mg/L*	
SP60-CH-105-010	1.00	3a	6/7/2006	46	na	na	
SP60-CH-113-015	1.50	3a	6/7/2006	7	na	na	
SP60-CH-113-020	2.00	3a	6/7/2006	0	na	na	
SP60-CH-119-000	0.25	3b	6/7/2006	1,675	na	na	
SP60-CH-106-005	0.50	3b	6/7/2006	67	na	na	
SP60-CH-106-010	1.00	3b	6/7/2006	0	na	na	
SP60-CH-151-005	0.50	4a	8/6/2006	na	3,570	na	
SP60-CH-114-010	1.00	4a	6/7/2006	10	na	na	
SP60-CH-151-010	1.00	4a	8/6/2006	na	180	na	
SP60-CH-114-015	1.50	4a	6/7/2006	0	na	na	
SP60-CH-151-015	1.50	4a	8/6/2006	na	567	na	
SP60-CH-114-020	2.00	4a	6/7/2006	0	na	na	
SP60-CH-151-020	2.00	4a	8/6/2006	na	656	na	
SP60-CH-122-000	0.25	4b	6/7/2006	1,816	na	na	
SP60-CH-152-005	0.50	4b	8/6/2006	na	62	na	
SP60-CH-152-010	1.00	4b	8/6/2006	na	27	na	
SP60-CH-152-015	1.50	4b	8/6/2006	na	24	na	
SP60-CH-152-020	2.00	4b	8/6/2006	na	25	na	
SP60-CH-121-000	0.25	5a	6/7/2006	502	na	na	
SP60-CH-121-000D	0.25	5a	6/7/2006	621	na	na	
SP60-CH-115-005	0.50	5a	6/7/2006	143	na	na	
SP60-CH-115-010	1.00	5a	6/7/2006	196	na	na	
SP60-CH-115-015	1.50	5a	6/7/2006	424	na	na	
SP60-CH-115-015D	1.50	5a	6/7/2006	374	na	na	
SP60-CH-115-020	2.00	5a	6/7/2006	20	na	na	
SP60-CH-116-005	0.50	5b	6/7/2006	7	na	na	
SP60-CH-116-010	1.00	5b	6/7/2006	130	na	na	
SP60-CH-116-015	1.50	5b	6/7/2006	317	na	na	
SP60-CH-116-015D	1.50	5b	6/7/2006	239	na	na	
SP60-CH-116-020	2.00	5b	6/7/2006	12	na	na	
SP60-CH-109-005	0.50	6a	6/7/2006	139	na	na	
SP60-CH-109-010	1.00	6a	6/7/2006	53	na	na	
SP60-CH-120-000	0.25	6b	6/7/2006	223	na	na	
SP60-CH-110-005	0.50	6b	6/7/2006	31	na	na	
SP60-CH-110-010	1.00	6b	6/7/2006	0	na	na	
SP60-CH-103-000	0.25	7a	6/7/2006	313	na	na	
SP60-CH-118-000	0.25	7a	6/7/2006	1,037	na	na	
SP60-CH-103-005	0.50	7a	6/5/2006	422	406	na	No

Final Sample ID	DEPTH (ft)	Building Subarea	Sampling Date	Total Lead FPXRF Result[1] (mg/kg)	Total Lead Fixed-Lab Result (mg/kg)	Leachable Lead Fixed-Lab Result (mg/L)	False Negative Result[2] for FPXRF compared with Fixed-Lab Result (Yes/No)
				ADEC Cleanup >400 mg/kg	*ADEC Cleanup >400 mg/kg*	*RCRA Hazardous Waste >5.0 mg/L*	
SP60-CH-103-005D	0.50	7a	6/5/2006	603	na	na	
SP60-CH-103-010	1.00	7a	6/5/2006	213	na	na	
SP60-CH-103-015	1.50	7a	6/5/2006	39	66	na	No
SP60-CH-103-020	2.00	7a	6/5/2006	663	na	na	
SP60-CH-104-005	0.50	7b	6/5/2006	230	na	na	
SP60-CH-104-010	1.00	7b	6/5/2006	892	60	na	No
SP60-CH-104-015	1.50	7b	6/5/2006	189	159	na	No
SP60-CH-104-015D	1.50	7b	6/5/2006	316	na	na	
SP60-CH-104-020	2.00	7b	6/5/2006	227	na	na	
SP60-CH-104-020D	2.00	7b	6/5/2006	279	na	na	
SP60-CH-107-005	0.50	8a	6/7/2006	313	341	na	No
SP60-CH-107-005D	0.50	8a	6/7/2006	264	na	na	
SP60-CH-107-010	1.00	8a	6/7/2006	743	na	na	
SP60-CH-107-015	1.50	8a	6/7/2006	790	na	na	
SP60-CH-107-020	2.00	8a	6/7/2006	92	na	na	
SP60-CH-108-000	0.25	8b	6/7/2006	192	na	na	
SP60-CH-108-005	0.50	8b	6/7/2006	150	na	na	
SP60-CH-108-010	1.00	8b	6/7/2006	100	na	na	
SP60-CH-108-015	1.50	8b	6/7/2006	0	na	na	
SP60-CH-108-020	2.00	8b	6/7/2006	35	na	na	
TEACHER HOUSE 101							
SP60-CH-205-000	0.25	1a	6/6/2006	35	na	na	
SP60-CH-205-005	0.50	1a	6/6/2006	94	na	na	
SP60-CH-205-010	1.00	1a	6/6/2006	1,077	na	na	
SP60-CH-205-015	1.50	1a	6/6/2006	395	289	na	No
SP60-CH-205-015D	1.50	1a	6/6/2006	372	na	na	
SP60-CH-205-020	2.00	1a	6/6/2006	13	na	na	
SP60-CH-206-005	0.50	1b	6/6/2006	9	na	na	
SP60-CH-206-010	1.00	1b	6/6/2006	65	na	na	
SP60-CH-206-015	1.50	1b	6/6/2006	67	na	na	
SP60-CH-206-015D	1.50	1b	6/6/2006	68	na	na	
SP60-CH-206-020	2.00	1b	6/6/2006	18	na	na	
SP60-CH-207-000	0.25	2a	6/6/2006	127	na	na	
SP60-CH-207-005	0.50	2a	6/6/2006	1,353	na	na	
SP60-CH-207-010	1.00	2a	6/6/2006	1,583	na	na	
SP60-CH-207-015	1.50	2a	6/6/2006	4	na	na	
SP60-CH-207-020	2.00	2a	6/6/2006	35	na	na	

Final Sample ID	DEPTH (ft)	Building Subarea	Sampling Date	Total Lead FPXRF Result[1] (mg/kg)	Total Lead Fixed-Lab Result (mg/kg)	Leachable Lead Fixed-Lab Result (mg/L)	False Negative Result[2] for FPXRF compared with Fixed-Lab Result (Yes/No)
				ADEC Cleanup >400 mg/kg	*ADEC Cleanup >400 mg/kg*	*RCRA Hazardous Waste >5.0 mg/L*	
SP60-CH-208-000	0.25	2b	6/6/2006	499	na	na	
SP60-CH-208-005	0.50	2b	6/6/2006	991	na	na	
SP60-CH-208-010	1.00	2b	6/6/2006	63	na	na	
SP60-CH-208-015	1.50	2b	6/6/2006	0	na	na	
SP60-CH-208-020	2.00	2b	6/6/2006	2	na	na	
SP60-CH-203-000	0.25	3a	6/6/2006	887	288	na	No
SP60-CH-203-005	0.50	3a	6/6/2006	9,936	na	na	
SP60-CH-203-010	1.00	3a	6/6/2006	5,841	na	na	
SP60-CH-203-015	1.50	3a	6/6/2006	0	na	na	
SP60-CH-203-020	2.00	3a	6/6/2006	0	na	na	
SP60-CH-204-000	0.25	3b	6/6/2006	445	493	na	No
SP60-CH-204-000D	0.25	3b	6/6/2006	564	na	na	
SP60-CH-204-005	0.50	3b	6/6/2006	471	304	na	No
SP60-CH-204-010	1.00	3b	6/6/2006	14	14	na	No
SP60-CH-204-015	1.50	3b	6/6/2006	0	na	na	
SP60-CH-204-020	2.00	3b	6/6/2006	0	na	na	
SP60-CH-209-000	0.25	4a	6/6/2006	264	na	na	
SP60-CH-209-005	0.50	4a	6/6/2006	212	na	na	
SP60-CH-209-010	1.00	4a	6/6/2006	16	na	na	
SP60-CH-209-015	1.50	4a	6/6/2006	5	na	na	
SP60-CH-209-020	2.00	4a	6/6/2006	3	na	na	
SP60-CH-210-005	0.50	4b	6/6/2006	1,176	na	na	
SP60-CH-210-010	1.00	4b	6/6/2006	56	na	na	
SP60-CH-210-015	1.50	4b	6/6/2006	10	na	na	
SP60-CH-210-020	2.00	4b	6/6/2006	0	na	na	
SP60-CH-201-000	0.25	5a	6/6/2006	305	na	na	
SP60-CH-201-000D	0.25	5a	6/6/2006	262	na	na	
SP60-CH-201-005	0.50	5a	6/6/2006	1,342	na	na	
SP60-CH-201-010	1.00	5a	6/6/2006	373	na	na	
SP60-CH-201-010D	1.00	5a	6/6/2006	444	na	na	
SP60-CH-201-015	1.50	5a	6/6/2006	11	na	na	
SP60-CH-201-020	2.00	5a	6/6/2006	54	na	na	
SP60-CH-202-000	0.25	5b	6/6/2006	356	na	na	
SP60-CH-202-000D	0.25	5b	6/6/2006	400	na	na	
SP60-CH-202-005	0.50	5b	6/6/2006	1,350	na	na	
SP60-CH-202-010	1.00	5b	6/6/2006	387	166	na	No
SP60-CH-202-010D	1.00	5b	6/6/2006	404	na	na	
SP60-CH-202-015	1.50	5b	6/6/2006	1,331	na	na	

Final Sample ID	DEPTH (ft)	Building Subarea	Sampling Date	Total Lead FPXRF Result[1] (mg/kg)	Total Lead Fixed-Lab Result (mg/kg)	Leachable Lead Fixed-Lab Result (mg/L)	False Negative Result[2] for FPXRF compared with Fixed-Lab Result (Yes/No)
				ADEC Cleanup >400 mg/kg	*ADEC Cleanup >400 mg/kg*	*RCRA Hazardous Waste >5.0 mg/L*	
SP60-CH-202-020	2.00	5b	6/6/2006	219	na	na	
TEACHER HOUSE 103							
SP60-CH-303-000	0.25	1a	6/6/2006	183	na	na	
SP60-CH-303-005	0.50	1a	6/6/2006	245	na	na	
SP60-CH-303-010	1.00	1a	6/6/2006	244	242	na	No
SP60-CH-303-020	2.00	1a	6/6/2006	33	na	na	
SP60-CH-304-005	0.50	1b	6/6/2006	77	na	na	
SP60-CH-304-010	1.00	1b	6/6/2006	97	na	na	
SP60-CH-304-015	1.50	1b	6/6/2006	51	na	na	
SP60-CH-304-020	2.00	1b	6/6/2006	3	na	na	
SP60-CH-305-000	0.25	2a	6/6/2006	322	na	na	
SP60-CH-305-000D	0.25	2a	6/6/2006	421	625	na	No
SP60-CH-305-005	0.50	2a	6/6/2006	284	na	na	
SP60-CH-305-005D	0.50	2a	6/6/2006	321	na	na	
SP60-CH-305-010	1.00	2a	6/6/2006	333	310	na	No
SP60-CH-305-010D	1.00	2a	6/6/2006	325	na	na	
SP60-CH-305-015	1.50	2a	6/6/2006	124	na	na	
SP60-CH-305-020	2.00	2a	6/6/2006	5	na	na	
SP60-CH-306-005	0.50	2b	6/6/2006	461	na	na	
SP60-CH-306-005D	0.50	2b	6/6/2006	96	na	na	
SP60-CH-306-010	1.00	2b	6/6/2006	170	na	na	
SP60-CH-306-015	1.50	2b	6/6/2006	277	na	na	
SP60-CH-306-020	2.00	2b	6/6/2006	0	na	na	
SP60-CH-301-000	0.25	3a	6/6/2006	945	na	na	
SP60-CH-301-000D	0.25	3a	6/6/2006	723	na	na	
SP60-CH-301-005	0.50	3a	6/6/2006	182	na	na	
SP60-CH-301-010	1.00	3a	6/6/2006	103	na	na	
SP60-CH-301-015	1.50	3a	6/6/2006	4	na	na	
SP60-CH-301-020	2.00	3a	6/6/2006	4	na	na	
SP60-CH-302-000	0.25	3b	6/6/2006	145	na	na	
SP60-CH-302-005	0.50	3b	6/6/2006	437	377	na	No
SP60-CH-302-010	1.00	3b	6/6/2006	23	na	na	
SP60-CH-302-015	1.50	3b	6/6/2006	9	1	na	No
SP60-CH-302-020	2.00	3b	6/6/2006	1	na	na	
SP60-CH-307-000	0.25	4a	6/6/2006	2,349	1,260	na	No
SP60-CH-307-005	0.50	4a	6/6/2006	3,536	na	na	
SP60-CH-307-010	1.00	4a	6/6/2006	579	na	na	

Final Sample ID	DEPTH (ft)	Building Subarea	Sampling Date	Total Lead FPXRF Result[1] (mg/kg)	Total Lead Fixed-Lab Result (mg/kg)	Leachable Lead Fixed-Lab Result (mg/L)	False Negative Result[2] for FPXRF compared with Fixed-Lab Result (Yes/No)
				ADEC Cleanup >400 mg/kg	*ADEC Cleanup >400 mg/kg*	*RCRA Hazardous Waste >5.0 mg/L*	
SP60-CH-307-015	1.50	4a	6/6/2006	9	na	na	
SP60-CH-307-020	2.00	4a	6/6/2006	0	na	na	
SP60-CH-308-005	0.50	4b	6/6/2006	525	na	na	
SP60-CH-308-010	1.00	4b	6/6/2006	47	na	na	
SP60-CH-308-015	1.50	4b	6/6/2006	0	na	na	
SP60-CH-308-020	2.00	4b	6/6/2006	6	na	na	
SP60-CH-309-000	0.25	5a	6/6/2006	1,217	na	na	
SP60-CH-309-005	0.50	5a	6/6/2006	2,365	na	na	
SP60-CH-309-010	1.00	5a	6/6/2006	280	na	na	
SP60-CH-309-015	1.50	5a	6/6/2006	129	na	na	
SP60-CH-309-020	2.00	5a	6/6/2006	452	na	na	
SP60-CH-310-005	0.50	5b	6/6/2006	1,118	na	na	
SP60-CH-310-010	1.00	5b	6/6/2006	54	na	na	
SP60-CH-310-015	1.50	5b	6/6/2006	36	na	na	
SP60-CH-310-020	2.00	5b	6/6/2006	0	na	na	
SP60-CH-311-000	0.25	6a	6/6/2006	543	na	na	
SP60-CH-311-005	0.50	6a	6/6/2006	531	na	na	
SP60-CH-311-005D	0.50	6a	6/6/2006	556	na	na	
SP60-CH-311-010	1.00	6a	6/6/2006	496	na	na	
SP60-CH-311-010D	1.00	6a	6/6/2006	578	na	na	
SP60-CH-311-010D	1.00	6a	6/6/2006	542	na	na	
SP60-CH-311-015	1.50	6a	6/6/2006	232	na	na	
SP60-CH-311-020	2.00	6a	6/6/2006	91	na	na	
SP60-CH-312-005	0.50	6b	6/6/2006	579	na	na	
SP60-CH-312-005D	0.50	6b	6/6/2006	312	na	na	
SP60-CH-312-010	1.00	6b	6/6/2006	115	na	na	
SP60-CH-312-015	1.50	6b	6/6/2006	0	na	na	
SP60-CH-312-020	2.00	6b	6/6/2006	168	na	na	

PRE-TREATMENT WASTE DESIGNATION	Description	Sampling Date	Total Lead FPXRF Result[1] (mg/kg)	Total Lead Fixed-Lab Result (mg/kg)	Leachable Lead Fixed-Lab Result (mg/L)	False Negative Result[2] for FPXRF compared with Fixed-Lab Result (Yes/No)
			ADEC Cleanup >400 mg/kg	*ADEC Cleanup >400 mg/kg*	*RCRA Hazardous Waste >5.0 mg/L*	
SP60-TC-101-000	Duplex composite 1	6/7/2006	na	2,020	26.2	
SP60-TC-102-000	Duplex composite 2	6/7/2006	na	448	6.07	
SP60-TC-103-000	Duplex composite 3	6/7/2006	na	318	1.92	
SP60-TC-104-000	TH101 composite 1	6/6/2006	na	2,370	21.7	
SP60-TC-105-000	TH101 composite 2	6/6/2006	na	597	7.49	
SP60-TC-106-000	TH101 composite 3	6/6/2006	na	774	16.5	
SP60-TC-107-000	TH101 composite 4	6/6/2006	na	444	8.32	
SP60-TC-108-000	TH103 composite 1	6/6/2006	na	2,100	51.9	
SP60-TC-109-000	TH103 composite 2	6/6/2006	na	348	6.37	
SP60-TC-110-000	TH103 composite 3	6/6/2006	na	399	6.88	
SP60-TC-111-000	TH103 composite 4	6/6/2006	na	400	6.91	
SP60-TC-112-000	HEPA vac bag/paintchips	6/16/2006	na	1,230	33.6	

Notes:

(1) FPXRF results reported are the most probable concentration given the observation duration. Longer observations yield smaller error bars. Some results reported as negative concentrations are considered 0 and are listed as such on this table for clarity. Raw instrument output would show a negative concentration with error bars that would yield a concentration range that spans small positive and negative concentrations.

(2) NOAA evaluated FPXRF data quality in a qualitative manner by determining whether any FPXRF results showed a sample concentration at or below the ADEC residential soil cleanup level of 400 mg/kg when its fixed-laboratory duplicate indicated that sample was greater than 400 mg/kg. This evaluation shows that FPXRF would not likely cause NOAA to leave soil in place that is actually contaminated due to the FPXRF erroneously indicating the soil is clean. NOAA found 0 of 19 duplicate samples had false negative results.

If a particular sample had either no FPXRF or no fixed-laboratory result, the field was left blank.

na = not analyzed

Table 4-2. Treatability Study Data

Final Sample ID	**Total Lead Fixed-Lab Result (mg/kg)**	**Pre-Treatment Leachable Lead Fixed-Lab Result (mg/L)**
	ADEC Cleanup >400 mg/kg	*RCRA Hazardous Waste >5.0 mg/L*
Sample A - Untreated	999	9.11
Sample A - Treated	na	<1.0
Sample B - Untreated	2,630	9.35
Sample B- Treated	na	<1.0

Notes:
na = not analyzed

Table 4-3. Post-Treatment Waste Designation Data

Final Sample ID	**Depth (ft)**	**Building Subarea**	**Sampling Date**	**Total Lead Fixed-Lab Result (mg/kg)**	**Leachable Lead Fixed-Lab Result (mg/L)**
				ADEC Cleanup >400 mg/kg	*RCRA Hazardous Waste >5.0 mg/L*
DUPLEX					
SP60-CH-06	0.50	4b	10/15/2006	268	<0.5
SP60-CH-07	0.50	1a	10/15/2006	203	<0.5
TEACHER HOUSE 101					
SP60-CH-01	0.50	5a	10/15/2006	812	<0.5
SP60-CH-02	0.50	2b	10/15/2006	376	<0.5
TEACHER HOUSE 103					
SP60-CH-03	0.50	2b	10/15/2006	159	<0.5
SP60-CH-04	0.50	4a	10/15/2006	1,490	<0.5
SP60-CH-05[1]	0.50	4a	10/15/2006	2,400	<0.5

Note:
(1) SP60-CH-05 is a duplicate of SP60-CH-04

Table 4-4. Final Confirmation Data

Final Sample ID	Depth (ft)	Building Subarea	Sampling Date	Total Lead FPXRF Result[1] (mg/kg)	Total Lead Fixed-Lab Result (mg/kg)	False Negative Result[4] for FPXRF compared with Fixed-Lab Result (Yes/No)
				ADEC Cleanup >400 mg/kg	*ADEC Cleanup >400 mg/kg*	
DUPLEX						
SP60-CS-001-020	2.0	5a	10/21/2006	29	20.1	No
SP60-CS-002-015	1.5	7a	10/21/2006	159	201	No
SP60-CS-003-020	2.0	8a	10/21/2006	**654**	**1,830**	No
SP60-CS-004-020	2.0	4a	10/21/2006	5	27	No
SP60-CS-005-025	2.0	2a	10/21/2006	37	37	No
TEACHER HOUSE 101						
SP60-CS-006-025	2.5	1a	10/22/2006	36	85.4	No
SP60-CS-007-020	2.0	2a	10/22/2006	3	5.81	No
SP60-CS-008-020	2.0	3a	10/22/2006	34	22.5	No
SP60-CS-009-015	1.5	9a	10/22/2006	40	33	No
SP60-CS-010-025[2]	2.5	1a	10/22/2006	104	118	No
TEACHER HOUSE 103						
SP60-CS-011-005	0.5	3a	10/22/2006	12	30	No
SP60-CS-012-030	3.0	5a	10/22/2006	0	15.3	No
SP60-CS-013-020	2.0	6a	10/22/2006	26	62	No
SP60-CS-014-020	2.0	2a	10/22/2006	5	4	No
SP60-CS-015-020[3]	2.0	2a	10/22/2006	4	2	No

Notes:

(1) FPXRF results reported are the most probable concentration given the observation duration. Longer observations yield smaller error bars. Some results reported as negative concentrations are considered 0 and are listed as such on this table for clarity. Raw instrument output would show a negative concentration with error bars that would yield a concentration range that spans small positive and negative concentrations.

(2) SP60-CS-010-025 is a duplicate of SP60-CS-006-025

(3) SP60-CS-015-020 is a duplicate of SP60-CS-014-020

(4) NOAA evaluated FPXRF data quality in a qualitative manner by determining whether any FPXRF results showed a sample concentration at or below the ADEC residential soil cleanup level of 400 mg/kg when its fixed-laboratory duplicate indicated that sample was greater than 400 mg/kg. This evaluation shows that FPXRF would not likely cause NOAA to leave soil in place that is actually contaminated due to the FPXRF erroneously indicating the soil is clean. NOAA found 0 of 15 duplicate samples had false negative results. If a particular sample had either no FPXRF or no fixed-laboratory result, the field was left blank.

Table 4-5. Clean Backfill Characterization Sample Data

Final Sample ID	Depth (ft)	Sample Location	Sampling Date	Total Lead FPXRF Result[1] (mg/kg)	Total Lead Fixed-Lab Result (mg/kg)	False Negative Result[2] for FPXRF compared with Fixed-Lab Result (Yes/No)
				ADEC Cleanup >400 mg/kg	*ADEC Cleanup >400 mg/kg*	
DUPLEX						
SP60-CH-601-005	0.5	Lake Hill Scoria Pit	10/23/2006	0	0.211J	No
SP60-CH-602-005	0.5	Lake Hill Scoria Pit	10/23/2006	0	0.2J	No
SP60-CH-603-005	0.5	Lake Hill Scoria Pit	10/23/2006	0	0	No

Notes:

(1) FPXRF results reported are the most probable concentration given the observation duration. Longer observations yield smaller error bars. Some results reported as negative concentrations are considered 0 and are listed as such on this table for clarity. Raw instrument output would show a negative concentration with error bars that would yield a concentration range that spans small positive and negative concentrations.

(2) NOAA evaluated FPXRF data quality in a qualitative manner by determining whether any FPXRF results showed a sample concentration at or below the ADEC residential soil cleanup level of 400 mg/kg when its fixed-laboratory duplicate indicated that sample was greater than 400 mg/kg. This evaluation shows that FPXRF would not likely cause NOAA to leave soil in place that is actually contaminated due to the FPXRF erroneously indicating the soil is clean. NOAA found 0 of 3 duplicate samples had false negative results. If a particular sample had either no FPXRF or no fixed-laboratory result, the field was left blank.

J = The sample was below the laboratory's practical quantitation limit but above the detection limit. The concentration reported is an estimate.

Table 6-1
Fixed Laboratory Data Review Checklist

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
      ■ Yes ☐ No Comments: **ADEC approved NOAA's use of a field-portable x-ray fluorescence meter (FPXRF) for analyzing characterization samples for lead, though all confirmation and waste designation samples required fixed-laboratory ("lab") analysis by an ADEC-approved laboratory. All fixed lab samples were analyzed by ADEC-approved laboratories Friedman & Bruya (F&BI, [Seattle, WA]) or SGS Environmental Services (SGS, [Anchorage, AK]).**

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?
      ☐ Yes ■ No Comments:

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ■ Yes ☐ No Comments: **Completed for 5 of 5 fixed-lab sample delivery groups (SDGs).**

   b. Correct analyses requested?
      ■ Yes ☐ No Comments: **Correct for 5 of 5 fixed-lab SDGs.**

3. Laboratory Sample receipt documentation
   a. Sample/cooler temperature documented and within range at receipt ($4^o \pm 2^o$ C)?
      ☐ Yes ■ No Comments: **Two of five SDGs received by laboratory were measured at $4^o + 2^o$ C. The other three SDGs were received between 24° and 32° C.**

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?
      ■ Yes ☐ No Comments: **No preservation is required for lead soil samples.**

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
      ■ Yes ☐ No Comments:

Table 6-1
Fixed Laboratory Data Review Checklist

d. If there were any discrepancies, were they documented? – For example, incorrect sample containers/preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?
■ Yes ☐ No Comments: **Samples from the June 2006 and August 2006 site characterization activities were delivered to laboratory in new, resealable plastic bags instead of 4 ounce jars as specified in NOAA's Master Quality Assurance Plan (QAP). See 3a above regarding sample temperatures.**

e. Data quality or usability affected? Impacts on data should be minimal since no samples within any coolers were received frozen, containing any ice, or with bulging septa in the sample vials.. **Use of new, resealable plastic bags instead of 4 ounce glass jars did not affect data quality or usability. Lead in soil will not migrate from or adsorb to polyethylene plastic. Sealed bags will not be subject to cross-contamination. While three batches exceeded the specified temperature range above, this should have no impact on data quality. The melting point and boiling point temperatures of lead at standard atmospheric pressure are 328 °C and 1740 °C, respectively. Lead's vapor pressure does not exceed 1 millimeter of mercury until it reaches 980 °C. Lead is a naturally occurring element. Lead is non-volatile at 32°C, and will not degrade due to biological activity or other natural processes that can degrade organic contaminants at this temperature. Consequently, the quantity of lead in project samples would not vary with temperatures ranging between 4°C and 32°C.**

4. Case Narrative
   a. Present and understandable?
   ■ Yes ☐ No Comments: **All five sample data groups had understandable case narratives.**

   b. Discrepancies, errors or QC failures identified by the lab?
   ☐ Yes ■ No Comments:

   c. Were all corrective actions documented?
   ☐ Yes ☐ No Comments: **N/A – No corrective actions were noted or needed.**

   d. What is the effect on data quality/usability according to the case narrative? **No effect on data quality was noted in case narratives.**

Table 6-1
Fixed Laboratory Data Review Checklist

5. Samples Results
   a. Correct analyses performed/reported as requested on COC?
      ■ Yes ☐ No Comments:

   b. All applicable holding times met?
      ■ Yes ☐ No Comments: **The maximum holding time for lead in soil is 6 months per NOAA's Master QAP. All samples were analyzed within 1 month of collection.**

   c. All soils reported on a dry weight basis?
      ■ Yes ☐ No Comments:

   d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?
      ■ Yes ☐ No Comments:

   e. Data quality or usability affected? **There was no negative effect on data quality or usability.**

6. QC Samples
   a. Method Blank
      i. One method blank reported per matrix, analysis and 20 samples?
      ■ Yes ☐ No Comments:

      ii. All method blank results less than PQL?
      ■ Yes ☐ No Comments:

      iii. If above PQL, what samples are affected? **Not applicable to lead soil samples.**

      iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
      ☐ Yes ☐ No Comments: **None are needed.**

      v. Data quality or usability affected? **There was no effect on data quality or usability due to method blank problems.**

Table 6-1
Fixed Laboratory Data Review Checklist

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis and 20 samples?

☐ Yes ☐ No Comments: **Not applicable to lead soil samples.**

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples?

■ Yes ☐ No Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? Or project specified DQOs? (AK Petroleum methods 75-125 %R; all other analyses see the laboratory QC pages)

■ Yes ☐ No Comments:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? Or project specified DQOs?

☐ Yes ☐ No Comments: **No LCSD's were analyzed, so no precision data were generated for the LCS.**

v. If %R or RPD outside of acceptable limits, what samples are affected? **Not applicable.**

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No Comments: **Not applicable.**

vii. Data quality or usability affected? **No data quality or usability effects were noted for LCS.**

c. Surrogates – Organics only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

☐ Yes ☐ No Comments: **Not applicable to lead samples.**

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? Or project specified DQOs?

☐ Yes ☐ No Comments: **Not applicable to lead soil samples.**

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No Comments: **Not applicable to lead soil samples.**

iv. Data quality or usability affected? **Not applicable to lead soil samples.**

Table 6-1
Fixed Laboratory Data Review Checklist

d. Trip Blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): water and soil

i. One trip blank reported per matrix, analysis and cooler?

☐ Yes ☐ No Comments: **Not applicable to lead soil samples.**

ii. All results less than PQL? **Not applicable to lead soil samples.**

☐ Yes ☐ No Comments:

iii. If above PQL, what samples are affected? **Not applicable to lead soil samples.**

iv. Data quality or usability affected? **Not applicable to lead soil samples.**

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☐ Yes ■ No Comments: **PSI Environmental collected and analyzed field duplicates for waste treatment effectiveness/designation samples and final confirmation samples at a rate exceeding 10% (6 waste designation samples with 1 field duplicate; 13 final confirmation samples with 2 field duplicates). NOAA did not collect or analyze field duplicate samples during its June 2006 site characterization. For this sampling event, NOAA analyzed two other types of lab duplicates, consistent with its May 2006 Corrective Action Plan for the Lead Contaminated Soils Site. NOAA analyzed FPXRF laboratory quality control duplicates for its analyses at a rate greater than 10% (23 duplicate samples analyzed for 165 project samples analyzed for FPXRF). NOAA also tasked F&BI to verify the FPXRF results by analyzing quality assurance (QA) duplicates for 19 of the 165 project samples. NOAA sent QA duplicates to F&BI for fixed laboratory analysis using EPA Method 200.8. When NOAA compared the QA duplicate results to the FPXRF results and ADEC's residential cleanup level of 400 mg/kg for lead, it found no false negative results among the FPXRF data. NOAA did not analyze field duplicate samples for its August 2006 treatability testing, however it did analyze technology verification samples through F&BI to verify the vendor's in-house results for the treatment technology. NOAA analyzed 13 field duplicates for PSI's final confirmation sampling and 3 field duplicates for PSI's clean backfill characterization sampling using its FPXRF; the project samples collected by PSI were analyzed by SGS Environmental Services using EPA Method SW-846 6020. NOAA encountered no false positive FPXRF results with this 36 sample data set (19 during site investigation sampling, 13 during final confirmation sampling, and 3 during clean backfill characterization sampling).**

Table 6-1
Fixed Laboratory Data Review Checklist

ii. Submitted blind to lab?

■ Yes ■ No Comments: **PSI's field duplicate samples from waste treatment effectiveness/designation and final confirmation sampling in October 2006 were submitted to SGS as blind samples. NOAA's quality assurance samples from its June 2006 site investigation were submitted to F&BI as blind samples. No samples analyzed by NOAA with its FPXRF were blind.**

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

■ Yes ☐ No Comments: **The largest RPD for fixed laboratory results is treatment effectiveness/designation sample SP60-CH-04 and its blind field duplicate SP60-CH-05 were quantified as 1,490 mg/kg and 2,400 mg/kg, respectively, by SGS. This yields a RPD of 47, which is within the error limits for this type of precision. This variation is likely due to sample heterogeneity. It is important to note both the project sample and blind field duplicate are significantly greater than the ADEC residential cleanup level of 400 mg/kg, meaning these dissimilar results would not cause an incorrect decision regarding the need for soil removal.**

iv. Data quality or usability affected? **All field duplicate submissions to the laboratory were analyzed and all sampling and analysis precision calculations were within acceptance criteria.**

f. Decontamination or Equipment Blank (if applicable)

☐ Yes ■ No Comments: **The only reusable sampling equipment requiring decontamination were the steel hand trowels and direct-push cutting shoes used during the June 2006 site characterization. NOAA thoroughly decontaminated this equipment, but did not collect rinse blanks from the decontaminated equipment. NOAA did characterize the decontamination waste water (IDW) as containing lead at 12.2 µg/L, which is about 12.2 µg/kg assuming the decon water has a density of 1 kg/L. This concentration of lead would not cause a piece of sampling equipment to cross contaminate a soil sample to a concentration exceeding the ADEC residential soil cleanup level of 400 mg/kg (i.e., 12.2 µg/kg = 0.0122 mg/kg << 400 mg/kg).**

i. All results less than PQL?

☐ Yes ☐ No Comments: **Not applicable.**

ii. If above PQL, what samples are affected? **Not applicable.**

iii. Data quality or usability affected? **Not applicable.**

Table 6-1
Fixed Laboratory Data Review Checklist

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab specific, etc.)
    a. Defined and appropriate

    ■ Yes ☐ No Comments: **A number of F&BI results are "J" flagged as estimated concentrations between the MDL and PQL. F&BI Batch 608150 has one laboratory duplicate sample (608150-02) with an RPD of 130, which is much greater than the acceptable range of <20. F&BI indicated the result was likely due to sample heterogeneity (i.e., flagged by F&BI as "h" for matrix heterogeneity). NOAA notes that the reported project sample result of 3,570 mg/kg (SP60-CH-151-005) and the laboratory duplicate sample result of 759 mg/kg are both greater than the ADEC residential cleanup level of 400 mg/kg. Sample heterogeneity, in this instance, would not cause an incorrect characterization to occur relative to the site cleanup level. All other LCS were within the acceptable RPD range.**

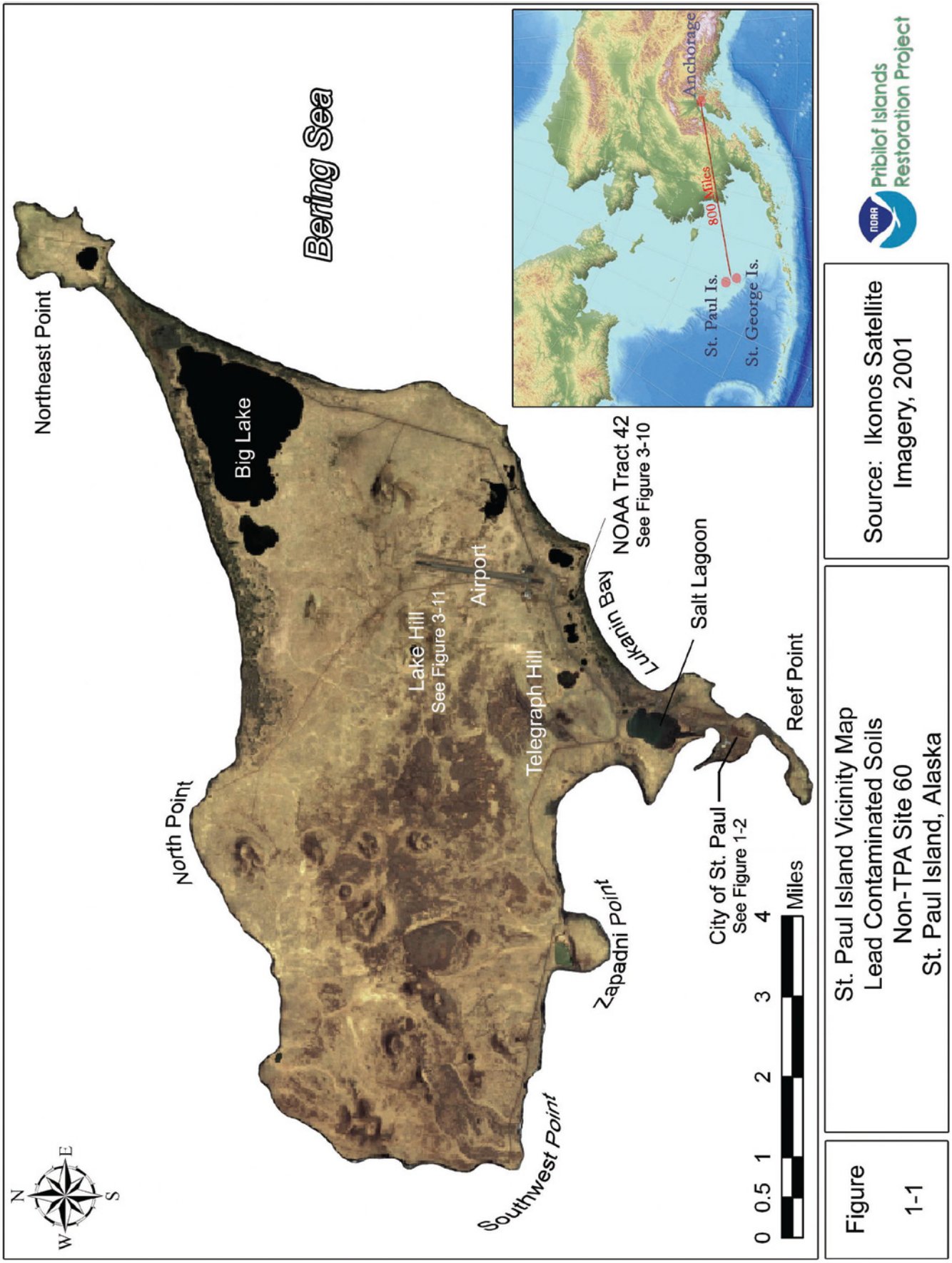
Completed by: **Gregory P. Gervais, P.E.**
Title: **Environmental Engineer** Date: **February 7, 2007**

Report Name: **Corrective Action Report/Conditional Closure Request, NOAA Site 60/Non-TPA – Lead Contaminated Soils. St. Paul Island, Alaska**

Report Date: **February 7, 2007**

Firm: **National Oceanic and Atmospheric Administration**

FIGURES


Bering Sea
Northeast Point
Big Lake
North Point
Lake Hill
See Figure 3-11
Airport
Telegraph Hill
Southwest Point
Zapadni Point
NOAA Tract 42
See Figure 3-10
Lukanin Bay
Salt Lagoon
City of St. Paul
See Figure 1-2
Reef Point
0 0.5 1 2 3 4 Miles
N
E
S
W
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Pribilof Islands Restoration Project
Source: Ikonos Satellite Imagery, 2001
St. Paul Island Vicinity Map
Lead Contaminated Soils
Non-TPA Site 60
St. Paul Island, Alaska
Figure
1-1

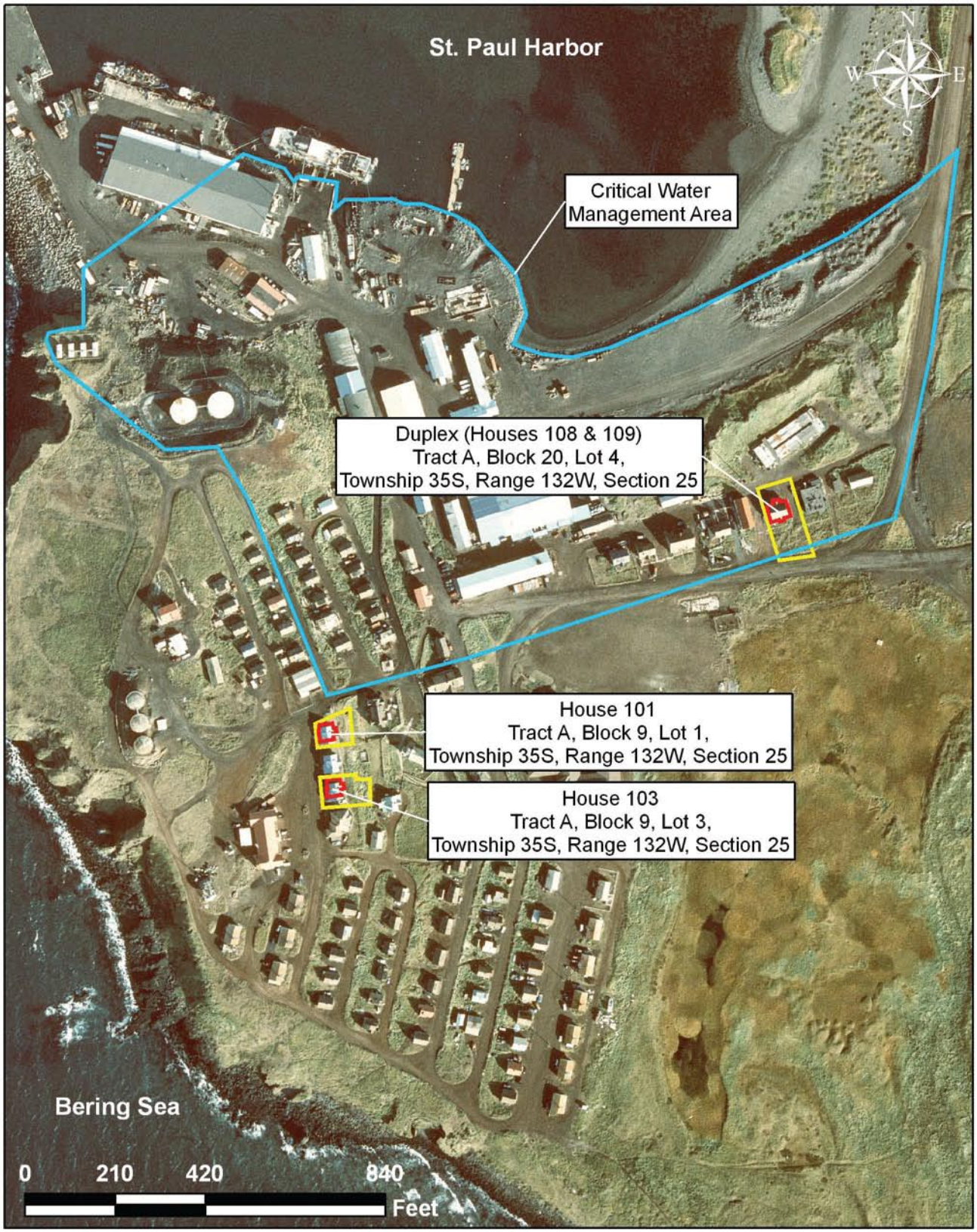


Figure 1-2	Site Location Map Lead Contaminated Soils NOAA Site 60 St. Paul Island, Alaska	Sources: Buildings (NOAA GIS 2006), Parcels (BLM 1983), Aerial Photo (AeroMap US 1996).

Pribilof Islands Restoration Project

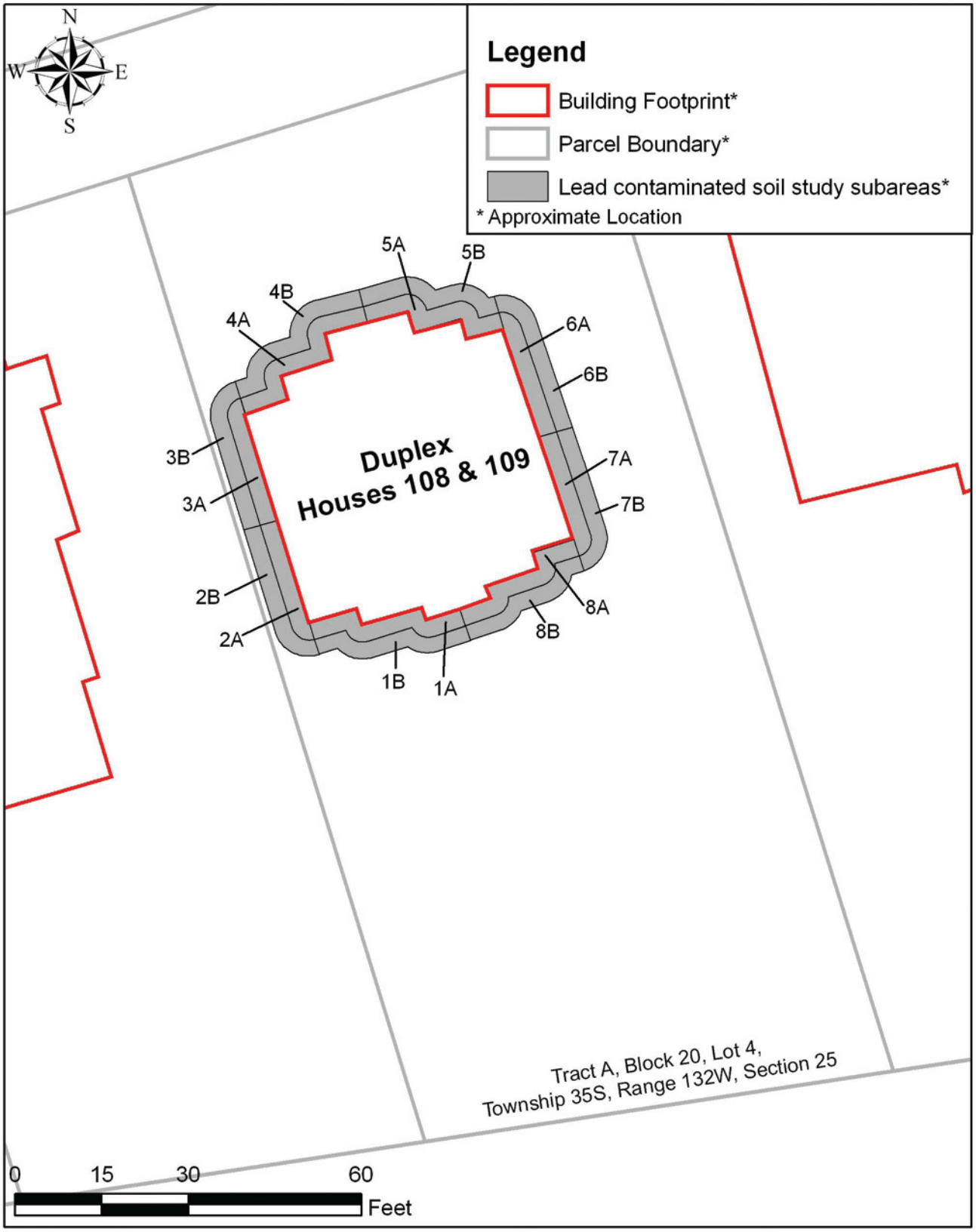


Figure 1-3	Lead-Contaminated Soil Study Area - Duplex NOAA Site 60 St. Paul Island, Alaska	Sources: Building and Soil Subareas (NOAA 2006), Parcel Boundaries (BLM 1983).	Pribilof Islands Restoration Project

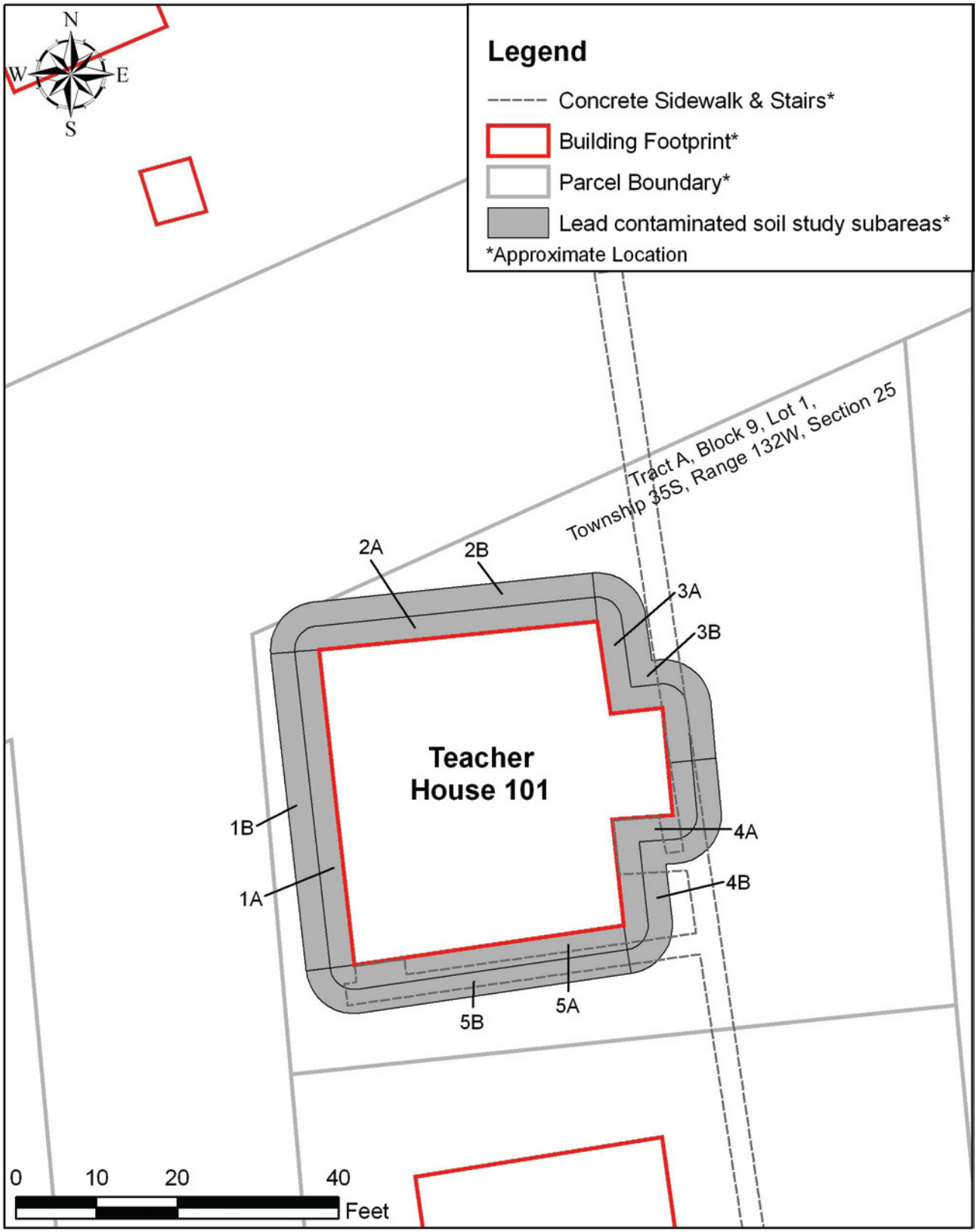


Figure 1-4	Lead-Contaminated Soil Study Area - Teacher House 101 NOAA Site 60 St. Paul Island, Alaska	Sources: Building and Soil Subareas (NOAA 2006), Parcel Boundaries (BLM 1983), Sidewalks (Hart Crowser 1999).

Pribilof Islands Restoration Project

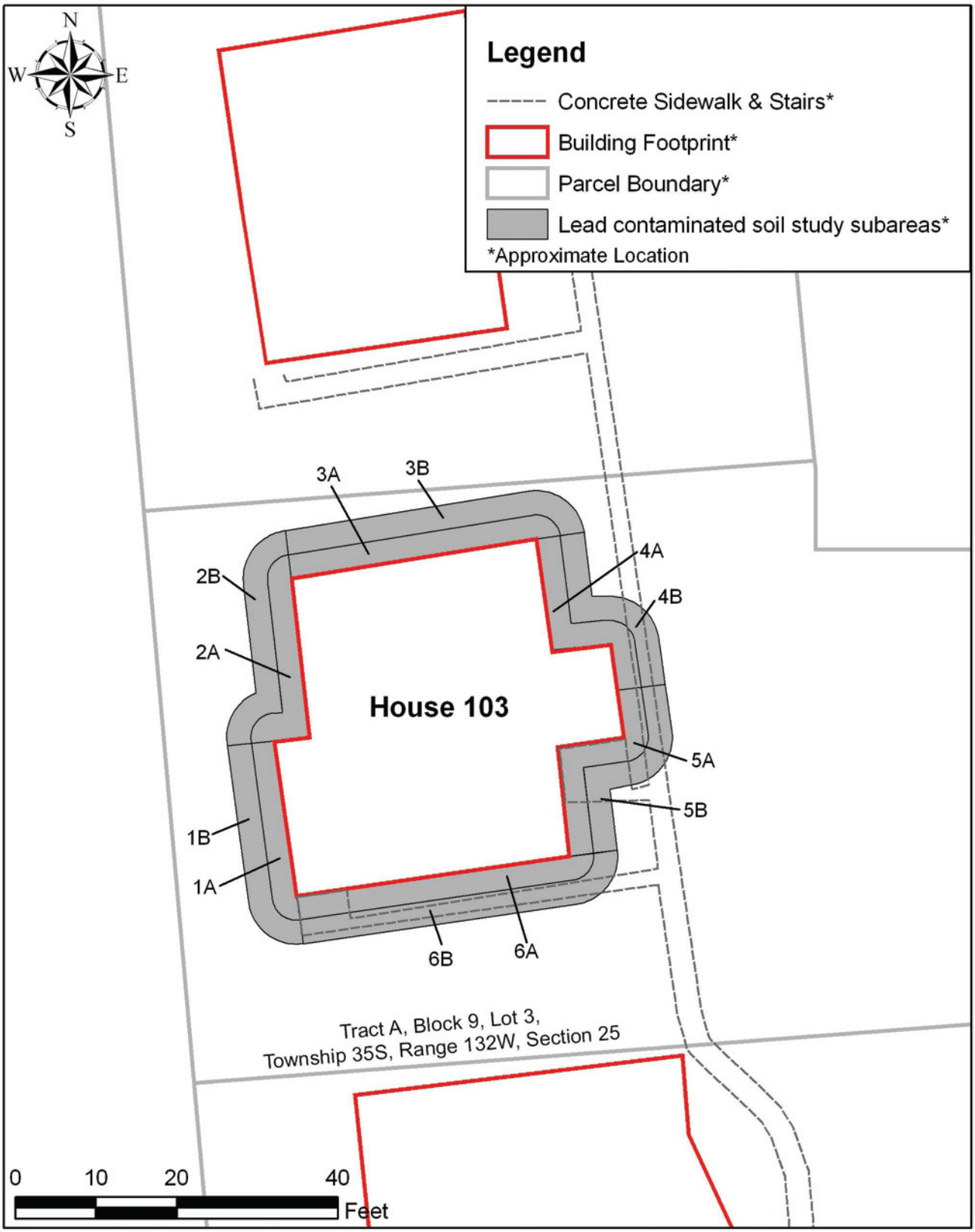


Figure 1-5	Lead-Contaminated Soil Study Area - House 103 NOAA Site 60 St. Paul Island, Alaska	Sources: Building and Soil Subareas (NOAA 2006), Parcel Boundaries (BLM 1983), Sidewalks (Hart Crowser 1999).	Pribilof Islands Restoration Project

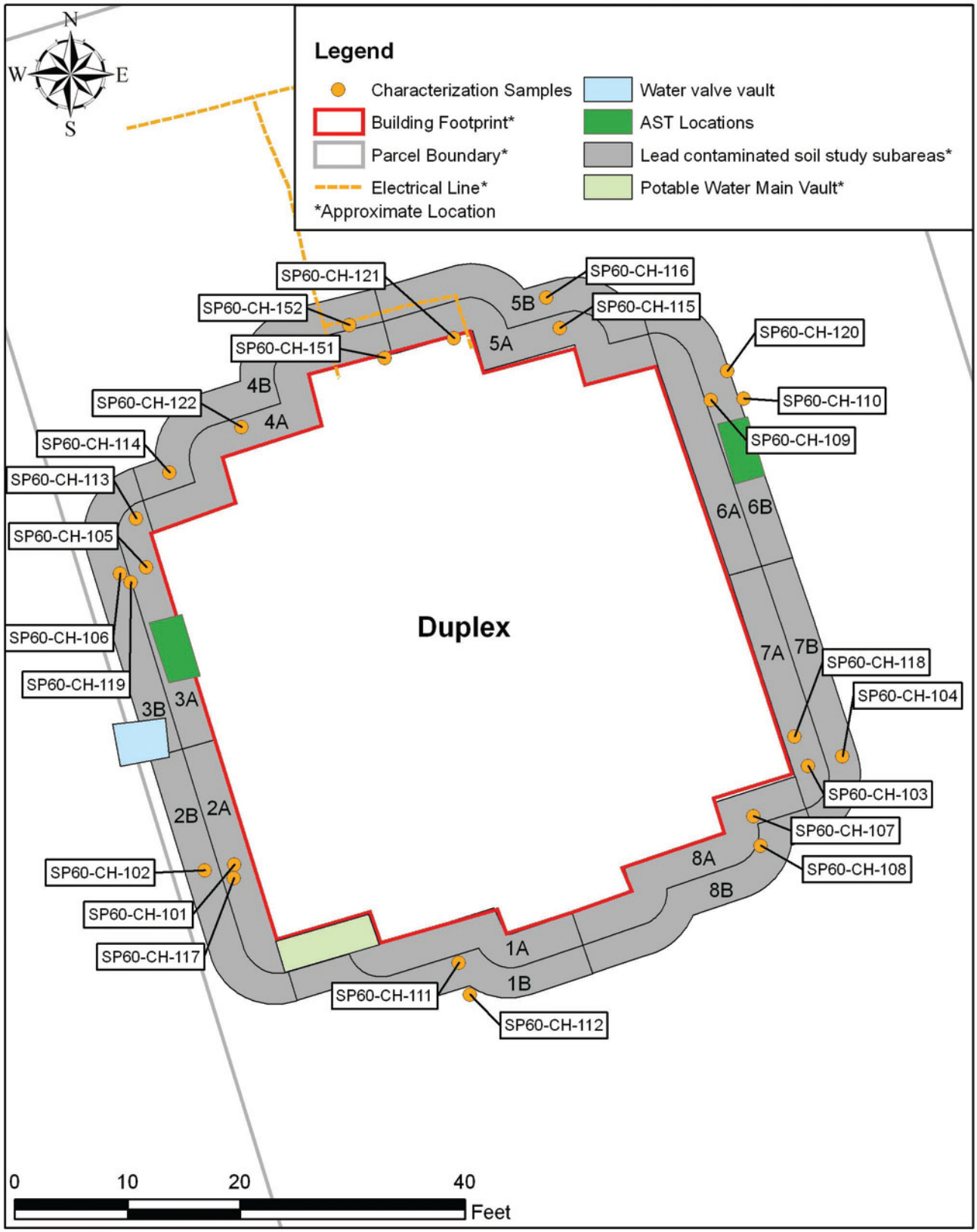


Figure 3-1	Proposed Study Area and Actual Site Investigation Sample Locations - Duplex NOAA Site 60 St. Paul Island, Alaska	Sources: Building, Subareas and Sample Locations (NOAA 2006), Parcel Boundaries (BLM 1983).

Pribilof Islands Restoration Project

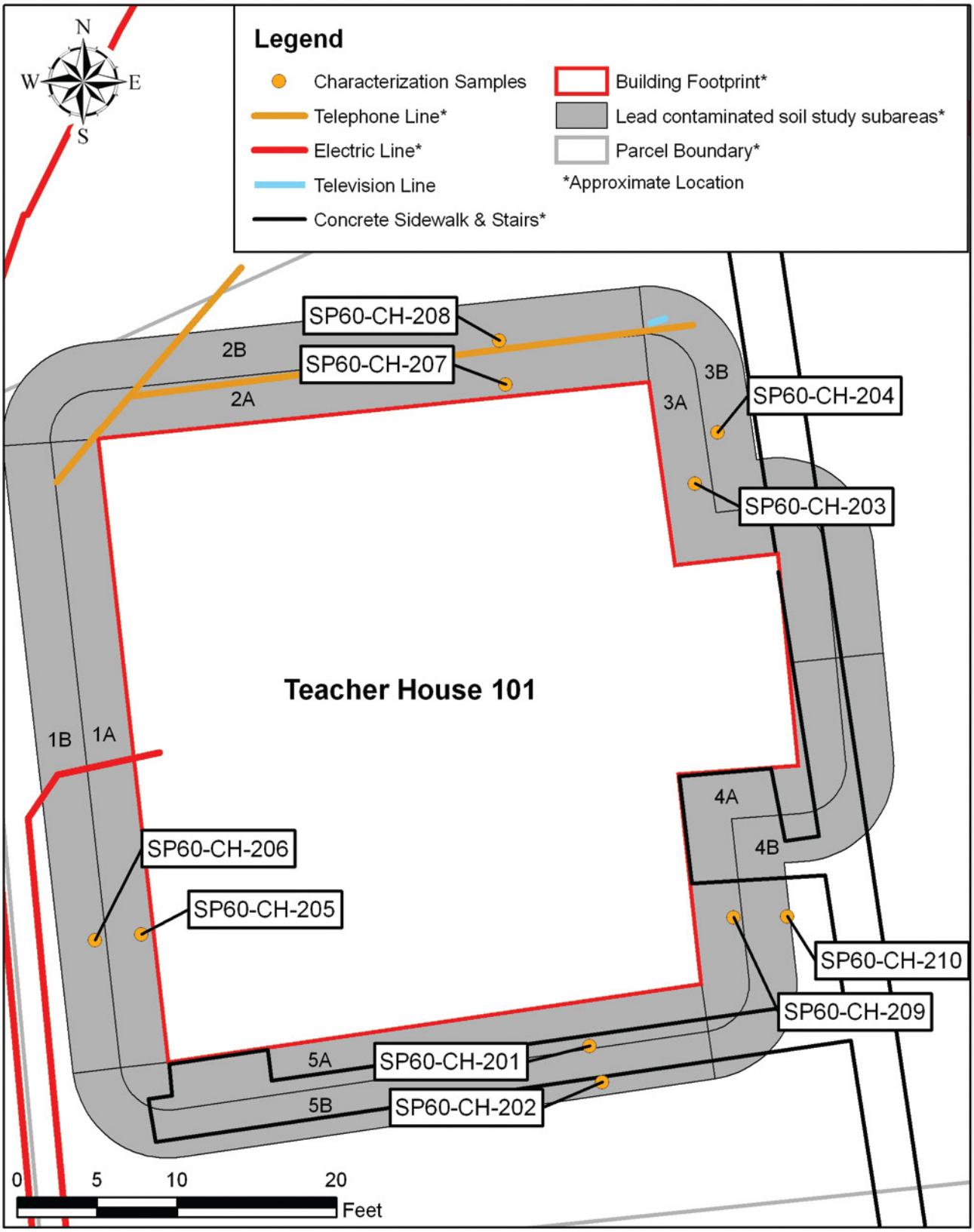


Figure 3-2

Proposed Study Area and Actual Site Investigation Sample Locations - Teacher House 101
NOAA Site 60
St. Paul Island, Alaska

Sources: Building, Subareas, and Sample Locations (NOAA 2006), Parcel Boundaries (BLM 1983).

Pribilof Islands Restoration Project

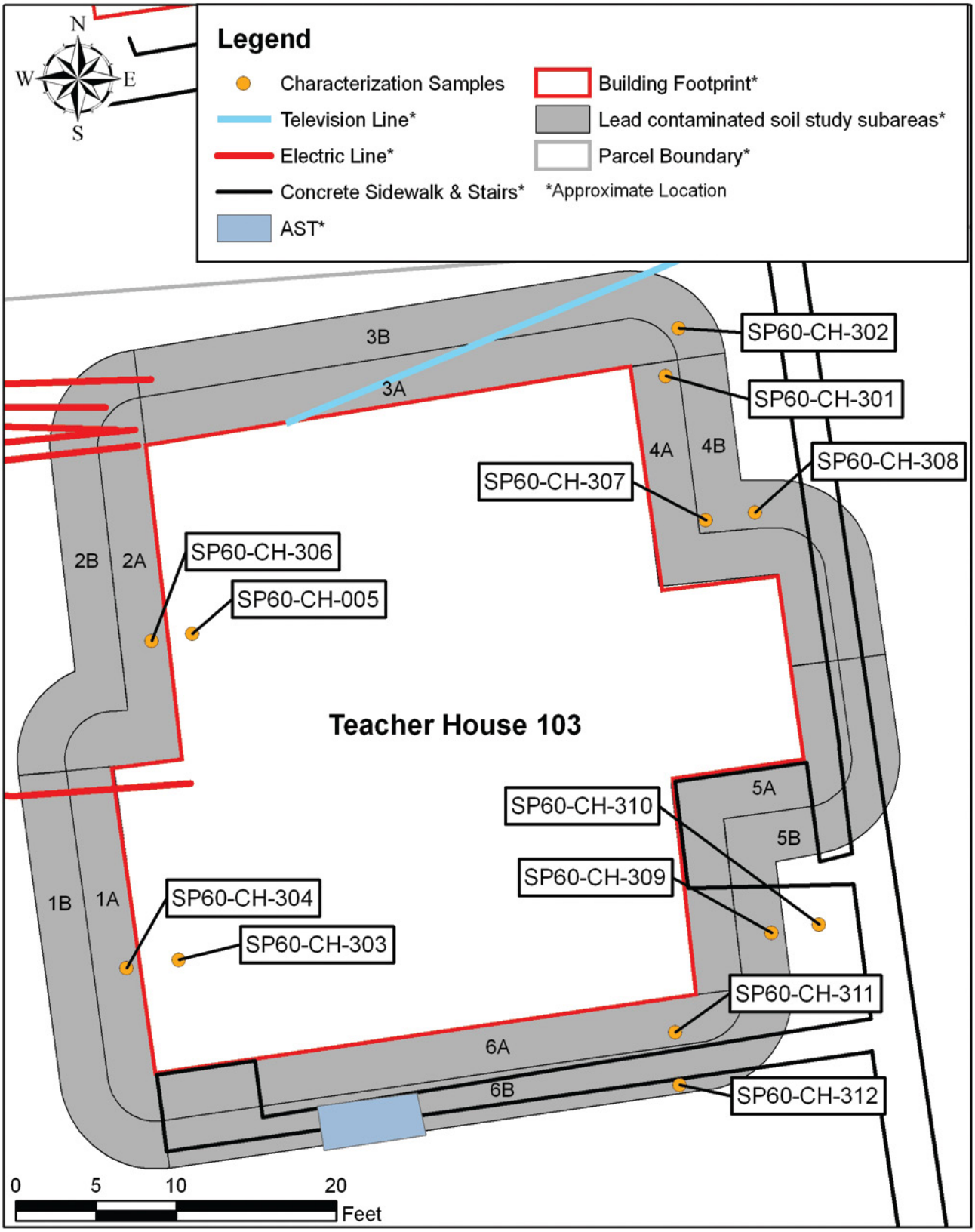


Figure 3-3	Proposed Study Area and Actual Site Investigation Sample Locations - Teacher House 103 NOAA Site 60 St. Paul Island, Alaska	Sources: Building, Subareas, and Sample Locations (NOAA 2006), Parcel Boundaries (BLM 1983), Sidewalk (Hart Crowser 1999)..

Pribilof Islands Restoration Project

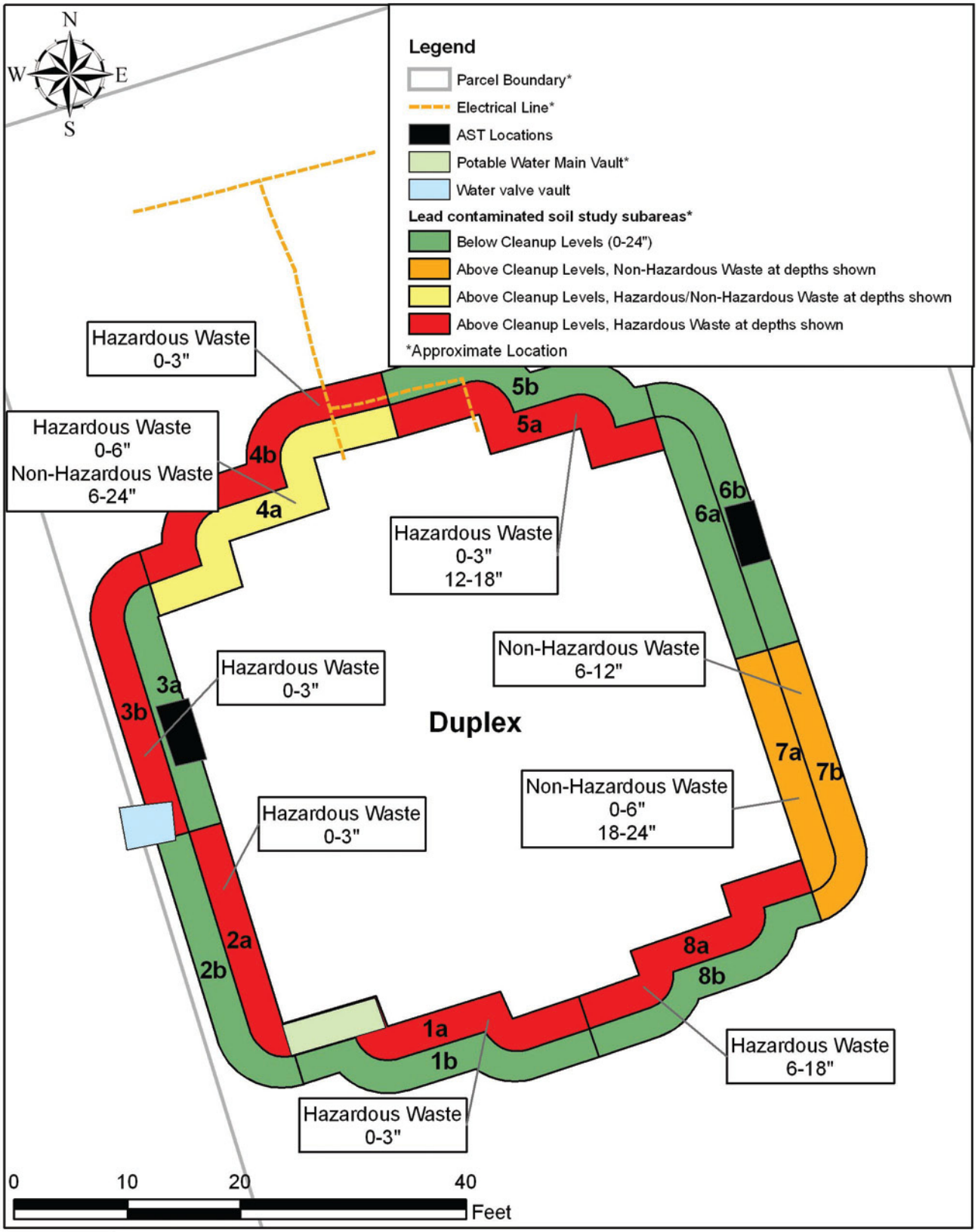


Figure 3-4	Planned Soil Treatment and Removal - Duplex NOAA Site 60 St. Paul Island, Alaska	Sources: Building and Subareas (NOAA 2006), Parcel Boundaries (BLM 1983).

Pribilof Islands Restoration Project

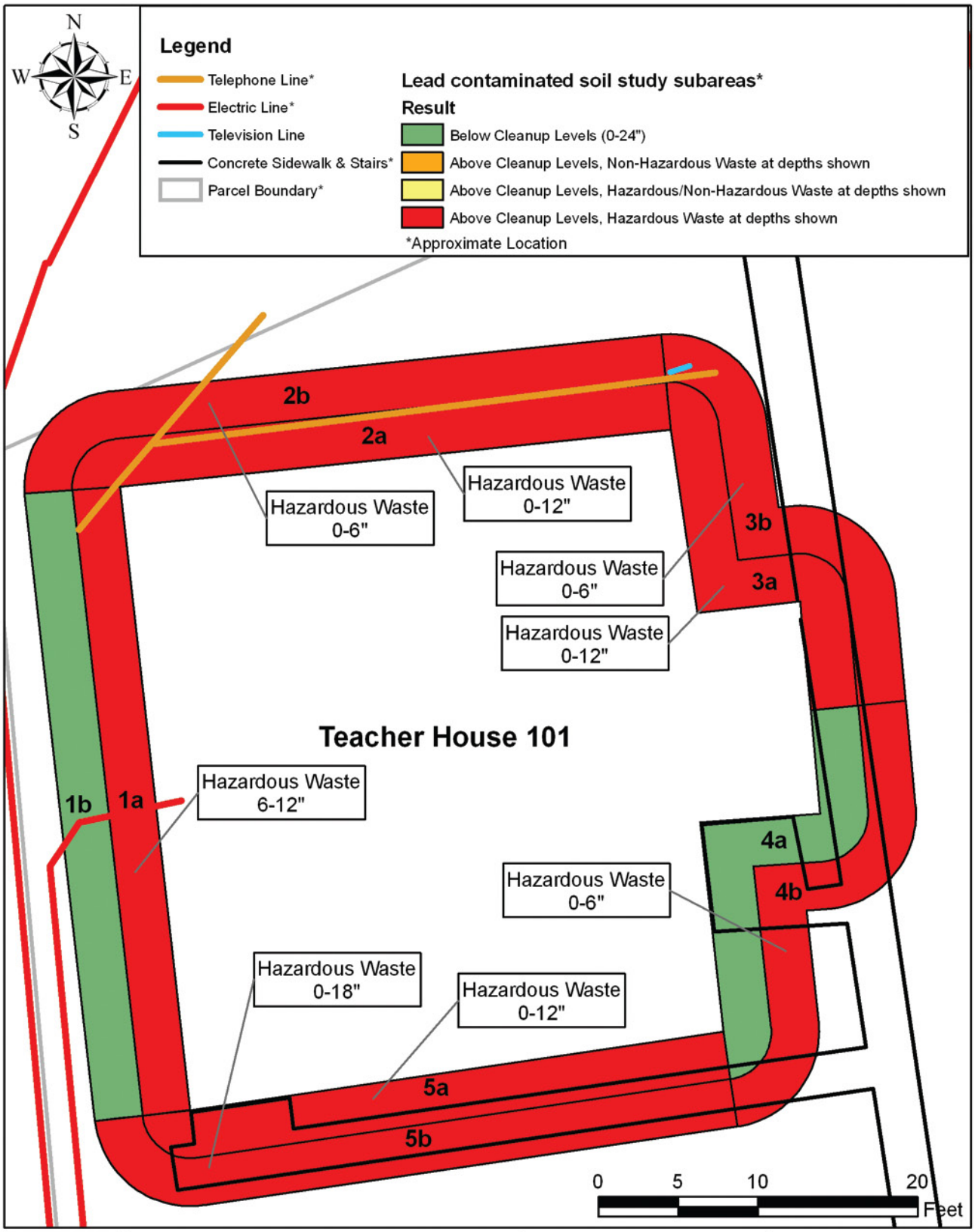


Figure 3-5	Planned Soil Treatment and Removal - Teacher House 101 NOAA Site 60 St. Paul Island, Alaska	Sources: Building and Subareas, (NOAA 2006), Parcel Boundaries (BLM 1983).

Pribilof Islands Restoration Project

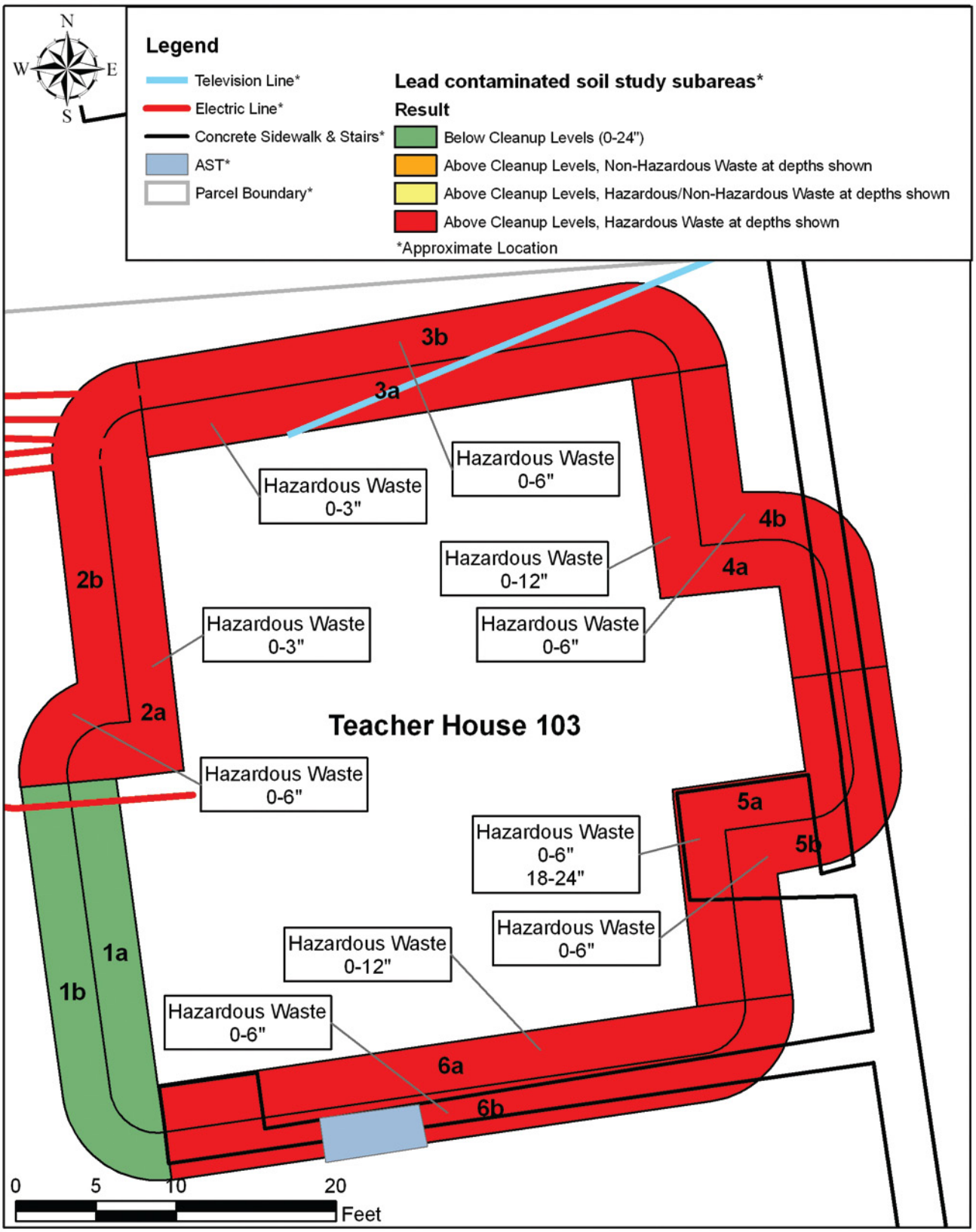


Figure 3-6	Planned Soil Treatment and Removal - Teacher House 103 NOAA Site 60 St. Paul Island, Alaska	Sources: Building and Subareas, (NOAA 2006), Parcel Boundaries (BLM 1983), Sidewalk (Hart Crowser 1999)..

Pribilof Islands Restoration Project

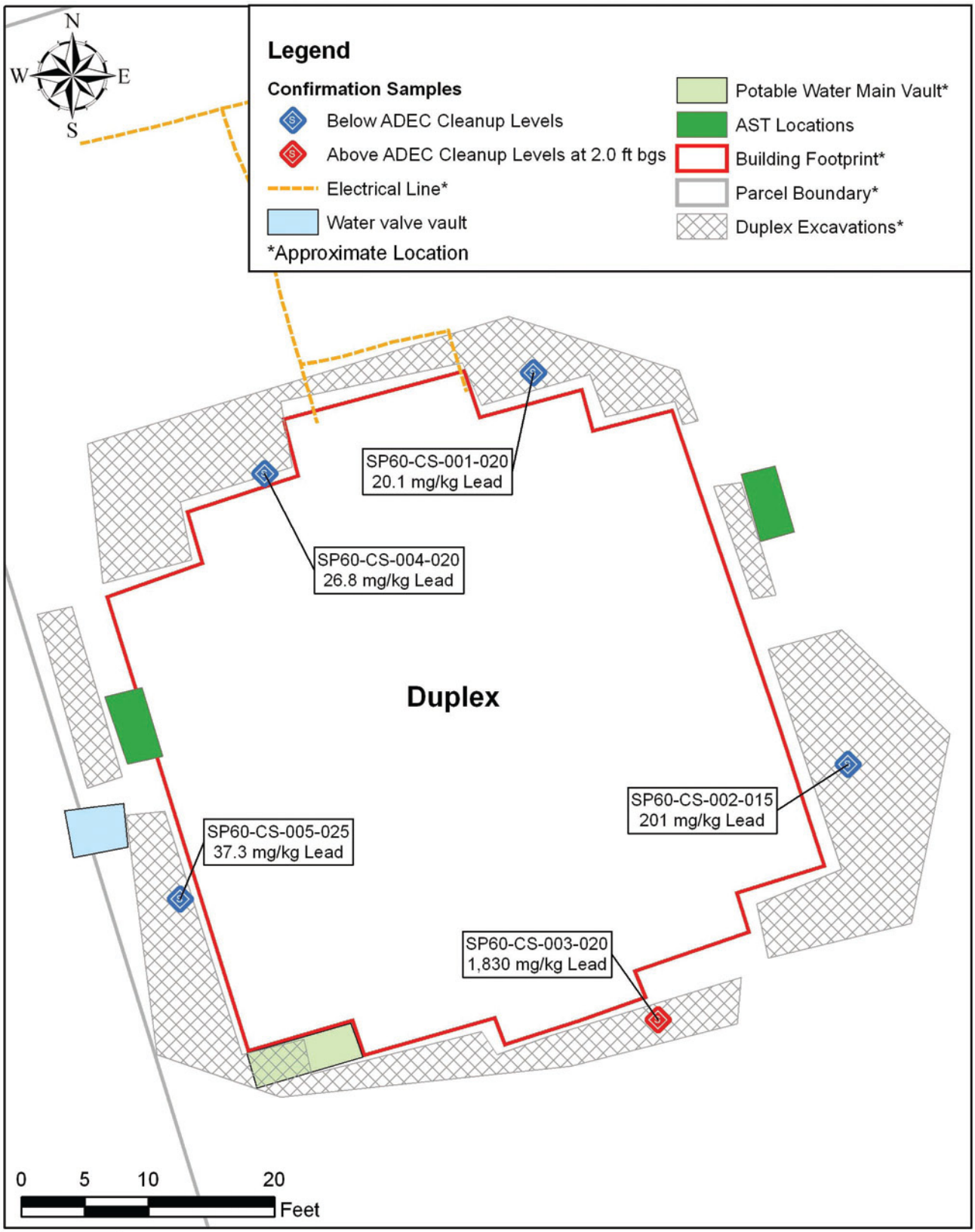


Figure 3-7	Confirmation Sampling Results and Excavation Extents Duplex NOAA Site 60 St. Paul Island, Alaska	Sources: Building Locations, Sample Locations, and Excavation Extents (NOAA 2006), Parcel Boundaries (BLM 1983).

Pribilof Islands Restoration Project

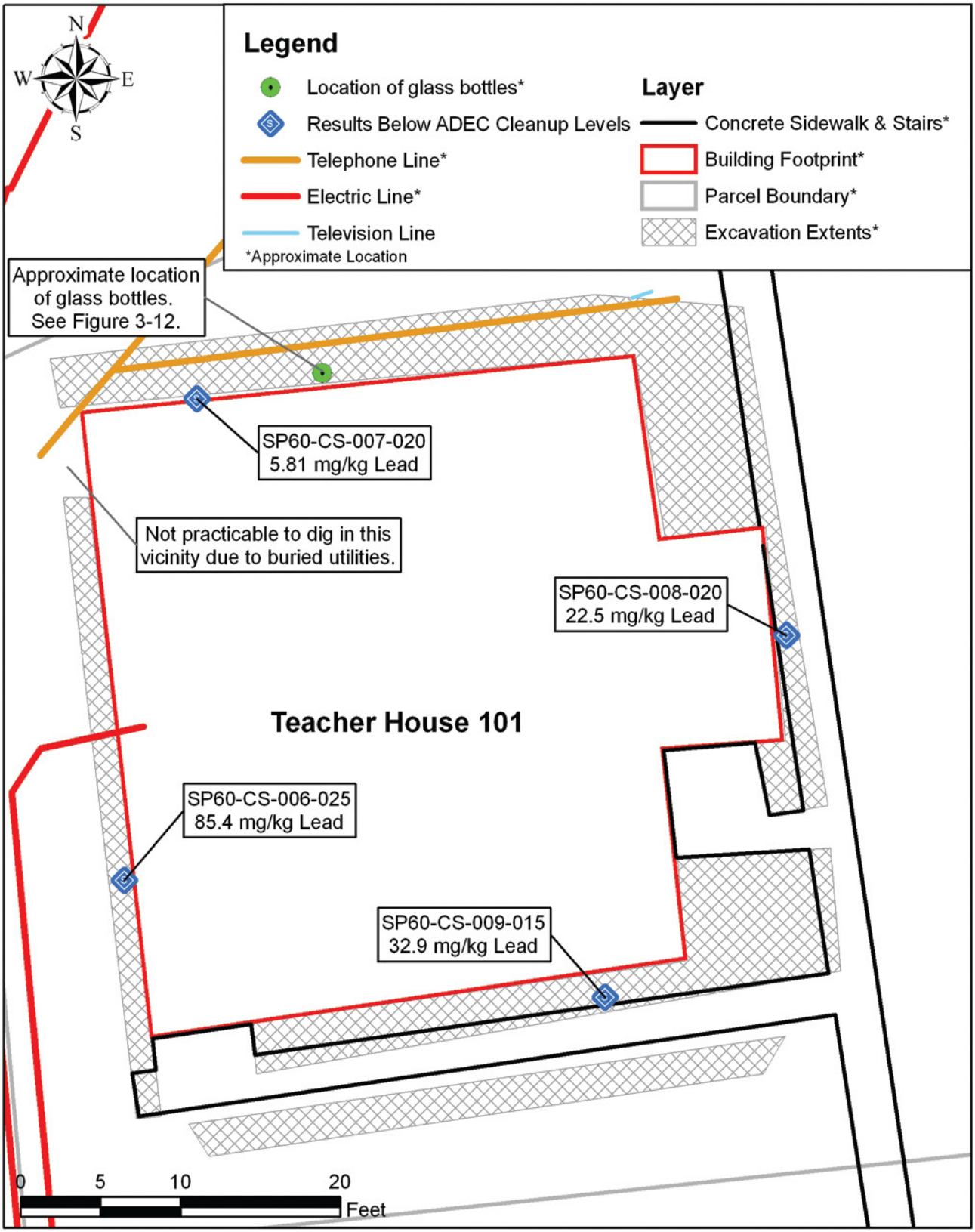


Figure 3-8

Confirmation Sampling Results and Excavation Extents
Teacher House 101
NOAA Site 60
St. Paul Island, Alaska

Sources: Building Locations, Sample Locations, and Excavation Extents (NOAA 2006), Parcel Boundaries (BLM 1983), Sidewalk (Hart Crowser 1999).

Pribilof Islands Restoration Project

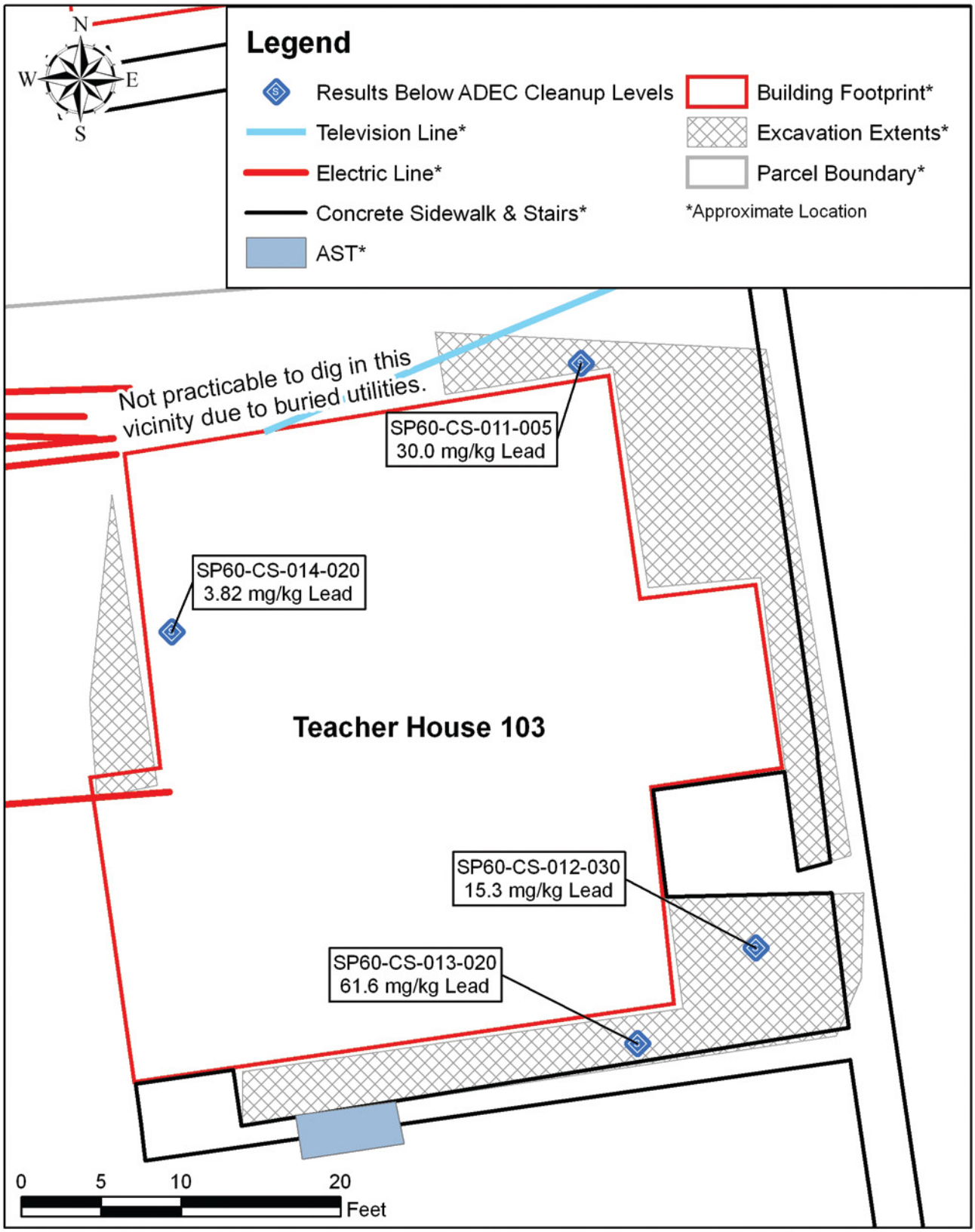


Figure 3-9	Confirmation Sampling Results and Excavation Extents Teacher House 103 NOAA Site 60 St. Paul Island, Alaska	Sources: Building Locations, Sample Locations, and Excavation Extents (NOAA 2006), Parcel Boundaries (BLM 1983), Sidewalk (Hart Crowser 1999).

Pribilof Islands Restoration Project

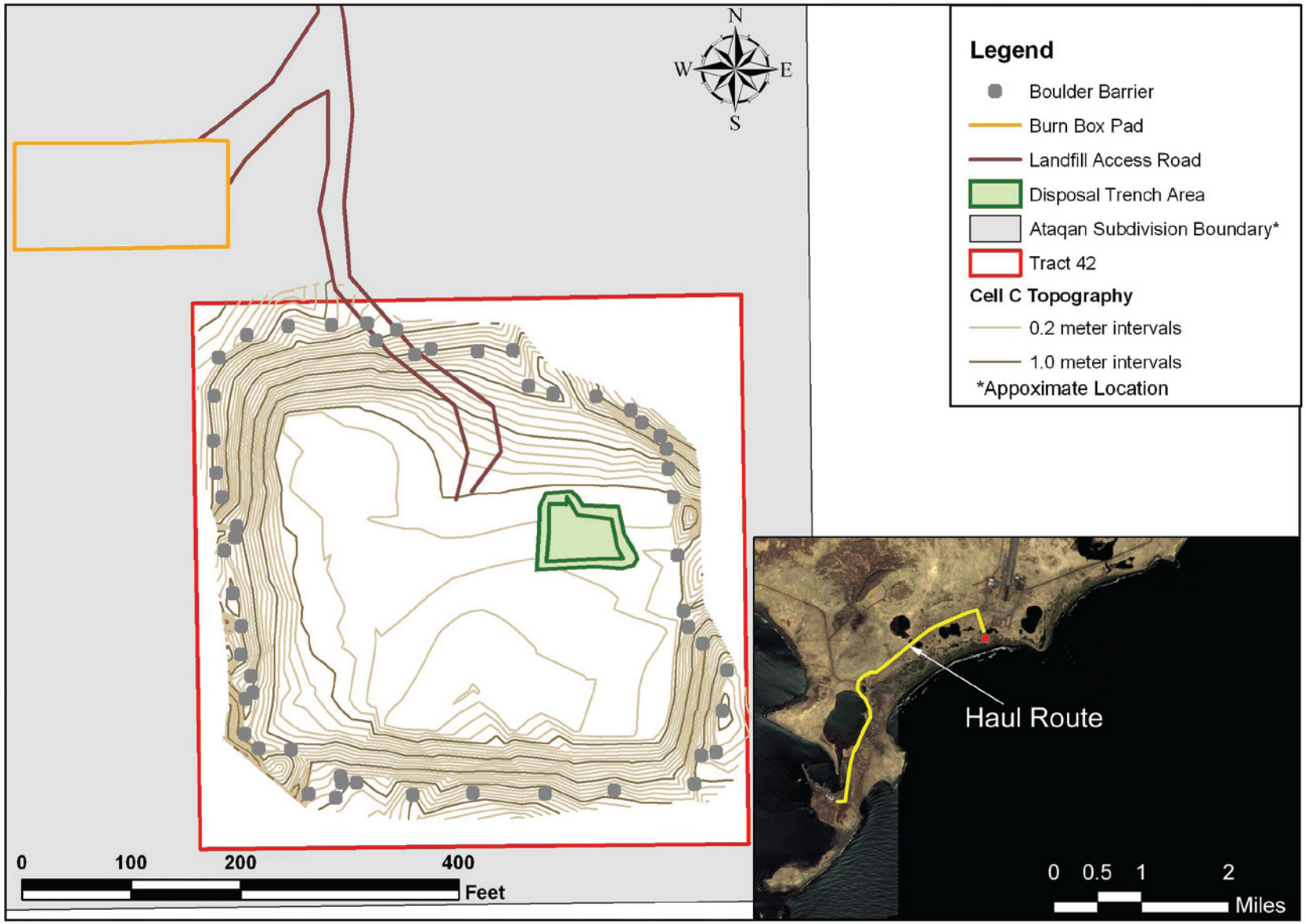


Figure 3-10

Waste Disposal Haul Route and Location
St. Paul Landfill/Tract 42
NOAA Site 60
St. Paul Island

Sources: Disposal Trench Area, Boulder Barrier, Burn Box Pad, Access Road, and Cell C Topography (NOAA 2003-2006), Tract 42 (BLM 1983), Ataqan Subdivision Boundary (Polarconsult 2001).

Pribilof Islands Restoration Project

Figure 3-11	Clean Backfill Borrow Area Haul Route and Sample Locations Lake Hill Scoria Pit NOAA Site 60 St. Paul Island, Alaska	Sources: Sample Locations (NOAA 2006), Scoria Pit Location (TTEMI 1999), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

Figure 3-12	Glass Bottles Encountered Along Teacher House 101 Foundation NOAA Site 60 St. Paul Island	Source: NOAA Pribilof Project Office.

Pribilof Islands Restoration Project

APPENDIX B: PHOTOGRAPHIC DOCUMENTATION

Photo 1. NTPA Site 60. Mike Baldwin, Chuck Mobley, and Jim Malchow at Site Investigation Test Pit. NOAA. 6/2006.

Photo 2. NTPA Site 60. Jim Wright Sampling During Site Investigation. NOAA. 6/2006.

Photo 3. NTPA Site 60. Jim Malchow w/Buried Cable TV Wire, NE Corner, TH101. NOAA. 6/2006.

Photo 4. NTPA Site 60. Buried Cable TV Wire, NE Corner, TH101. NOAA. 6/2006.

Photo 5. NTPA Site 60. Nir Barnea Sampling via Direct-Push, TH101. NOAA. 6/2006.

Photo 6. NTPA Site 60. Direct-Push Sample Sleeve. NOAA. 6/2006.

Photo 7. NTPA Site 60. Ray Beeter Treating Soil w/Ecobond, Duplex. NOAA. 10/2006.

Photo 8. NTPA Site 60. Ray Beeter and Nick Kozloff Excavating Soil, Duplex. NOAA. 10/2006.

Photo 9. NTPA Site 60. Excavation and Buried Telephone Lines, NW Corner,TH101. NOAA. 10/2006.

Photo 10. NTPA Site 60. Buried Telephone Lines, NW Corner,TH101. NOAA. 10/2006

Photo 11. NTPA Site 60. Excavation, NE and East Sides, TH101. NOAA. 10/2006.

Photo 12. NTPA Site 60. Richard Warner and Excavation, East Side, TH103. NOAA. 10/2006.

Photo 13. NTPA Site 60. Excavation Near AST, South Side, TH103. NOAA. 10/2006.

Photo 14. NTPA Site 60. Nick Kozloff Loading Temporary Stockpile, NE Corner, TH103. NOAA. 10/2006.

Photo 15. NTPA Site 60. Richard Warner and Nick Kozloff Loading Temporary Stockpile, SE Corner, TH103. NOAA. 10/2006.

Photo 16. NTPA Site 60. Temporary Stockpile Area After Loading, SE Corner, TH103. NOAA. 10/2006.

Photo 17. NTPA Site 60. Keith Guyer Sampling Clean Backfill, Lake Hill Scoria Pit. NOAA. 10/2006.

Photo 18. NTPA Site 60. Frank Shane Capping Disposal Pits, Landfill Cell C, Tract 42. NOAA. 12/2006.

Photo 19. NTPA Site 60. Frank Shane Capping Disposal Pits, Landfill Cell C, Tract 42. 12/2006.

Photo 20. NTPA Site 60. Greg Gervais Surveying Capped Disposal Trenches, Landfill Cell C, Tract 42. 12/2006.

Appendix II

APPENDIX II TO THE JUNE 4, 2008 REQUEST FOR CLOSURE OF THE ST. PAUL ISLAND, ALASKA, OPERABLE UNIT UNDER THE TWO-PARTY AGREEMENT BETWEEN THE ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION AND THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION SIGNED JANUARY 1996

In accordance with paragraph 59 of the Pribilof Islands Environmental Restoration Agreement (Two-Party Agreement or TPA) signed in January 1996 by designated officials of the State of Alaska and the National Oceanic and Atmospheric Administration (NOAA), NOAA requested Alaska Department of Environmental Conservation (ADEC), as the duly recognized representative of the State of Alaska, certification of NOAA's completion of corrective action for the St. Paul Island Operable Unit (OU).

NOAA asserted in its June 4, 2008 cover letter to ADEC that it had completed in accordance with the TPA all investigations and corrective actions approved by ADEC, to the extent practicable by:

- removing drums and debris,
- removing underground storage tanks (USTs) and above ground, storage tanks (ASTs),
- removing fuel pipelines,
- removing contaminated soil,
- closing solid waste sites, and
- characterizing and monitoring groundwater.

At each location, NOAA performed ADEC approved corrective actions to remove the potential sources of groundwater contamination. Corrective actions included capping of buried debris, excavation and disposal of vadose zone contaminated soil, and removal of underground storage tanks, above ground storage tanks, and fuel transfer pipelines, as appropriate. However, many corrective actions failed to remove all potential sources of groundwater contamination. Consequently, residual contamination remains at sites where underground utilities, building structures, consolidated soil (rock), large volumes of buried solid wastes, the presence of groundwater, or depths greater than fifteen (15) feet made contaminated soil removal impractical. A *Residual Contamination Report* included herein summarizes the nature and extent of residual contamination at each corrective action site.

During the course of environmental investigations at St. Paul Island, NOAA determined groundwater and surface water contamination existed above ADEC Table C cleanup levels (18 Alaska Administrative Code (AAC) Chapter 75.345) and the Clean Water Act (33 USC §1251 (33 U.S.C. Chapter 26, Subchapter III, 33 U.S.C. 1321 (b)(1 and 3), respectively, at the following locations:

1. St. Paul Village
2. Diesel Seep (groundwater and surface water)
3. Icehouse Lake.
4. St. Paul Landfill.

Because widespread groundwater contamination would not likely improve soon after source control, NOAA requested ADEC for an alternative cleanup standard ("10x Rule") determination in accordance with 18 AAC 75.345(b) (2). Such a determination was intended to serve as a land use or institutional control by placing legal restrictions to groundwater access to protect human and environmental health and welfare while natural attenuation processes worked to reduce contaminants to non-risk levels.

<u>Land Use Control - CWMA</u>

In 2002, at NOAA's request, ADEC approved alternative cleanup standards for groundwater and soil in a portion of St. Paul Village consistent with 18 AAC 75.345(b)(2). However, ADEC made its 10x Rule approval contingent on three requirements:

1. NOAA must consult with current and future landowners in the 10x Rule area regarding the effect of the rule on soil and groundwater cleanup levels, proper handling and disposal of contaminated soil in the rule area, and restrictions on groundwater use in the rule area.
2. NOAA must conduct a public meeting, together with ADEC, to discuss the 10x Rule with the community and offer the opportunity for comment.
3. NOAA must develop land use controls to prohibit or limit access to groundwater for use as drinking water and require contaminated soils to be handled and disposed of consistent with ADEC regulations.

NOAA satisfied the requirements, including implementation of land use controls with the 2006 designation of a critical water management area (CWMA) by the State of Alaska Department of Natural Resources.

Groundwater: Long-term Monitoring

For areas outside the bounds of the CWMA, NOAA undertook corrective actions and proposed long-term monitoring of the groundwater to satisfy Alaska regulations.

At the Diesel Seep, NOAA performed ADEC approved corrective actions intended to remove the source of surface water contamination due to the expression of petroleum sheen on the surface water of the nearby Salt Lagoon Channel. These corrective actions included vadose zone and saturated zone contaminated soil excavations, and dissolved and non-aqueous phase groundwater contaminant adsorption using two in-situ granular activated carbon trenches. These corrective actions successfully eliminated any expression of visible petroleum sheen to date.

At Icehouse Lake, NOAA performed corrective action by removing vadose zone soil contamination. Groundwater contamination decreased, but continued to exceed regulatory standards. NOAA is continuing long-term monitoring.

The St. Paul Landfill has not demonstrated a consistent groundwater contamination trend either before or following corrective action. However, NOAA is conducting landfill post-closure groundwater monitoring for a minimum of five years post-closure due to potential contaminant leaching from municipal solid waste, used oil disposal, construction and demolition debris, lead contaminated soil, lead-based paint abatement waste, and NOAA's beneficial re-use of petroleum-contaminated soil as landfill closure cap material.

NOAA's long-term groundwater monitoring plan not included herein was approved by ADEC in 2005. The plan detailed the groundwater sampling and analyses initiated during 2006 at the aforementioned sites. With ADEC's approval of this plan and based upon available information, NOAA considers groundwater and surface water corrective actions complete per TPA paragraph 59.

Appendix I includes copies of site closure documents and deed notices as appropriate.

FINAL

MTR 2002-23

Mitretek Technical Report

Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska

Technical Analysis and Recommendations

5 June 2002

John K. Miller

Customer:	National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration, Pribilof Project Office	**Contract No.:**	50-SPNA-9-00009
		Task Order:	56-S-NA-90003
Dept. No.:	H050	**Project No.:**	0699329C-PI

MTS™ Mitretek Systems *Innovative Technology in the Public Interest*
Center for Science and Technology
Falls Church, Virginia

1200-01-HP-9-0027

PDF 4...

Mitretek Systems

Mitretek Systems is a nonprofit, public interest corporation that works with federal, state, and local governments, as well as with other nonprofit public interest organizations, in the areas of scientific and information systems technologies. Incorporated in December 1995, Mitretek came into being as part of a restructuring of The MITRE Corporation. While Mitretek's name is new, the quality, value, and objectivity of Mitretek's work are well established based on past performance as part of The MITRE Corporation, which was founded in 1958. The corporate character and independence combined with the capability and broad-based experience of the professional staff have made Mitretek an unimpeachable source of conflict-free support for major federal environmental services and information systems acquisition life cycles.

Mitretek Systems is comprised of several centers of expertise. The ***Center for Science and Technology*** applies its systems engineering and scientific expertise to provide innovative solutions to problems concerning the environment, energy and resource systems, health information systems, biomedical sciences, industrial processes, public safety, and scientific and technical information technologies. The professional staff offers proficiency across a broad range of scientific and information systems technologies. This interdisciplinary team approach to projects enables Mitretek to address all facets of the situation at hand.

Executive Summary

Mitretek Systems conducted a review of the physical and chemical characteristics of the groundwater in the vicinity of Tract 46 on St. Paul Island to determine whether groundwater in the study area should be considered a potential drinking-water source. Attainment of a non-drinking water classification may allow a tenfold increase in the groundwater and soil cleanup criteria. Thus, the cleanup could proceed more quickly and at lower cost without any significant change to the risk to human health or the environment.

The regulations and guidance issued by the Alaska Department of Environmental Conservation (ADEC) consider all groundwater to be a drinking-water source unless a responsible party demonstrates or the department determines that the groundwater is not:

- Used for a private or public drinking-water system
- Within a zone of contribution, recharge area, or wellhead protection area for a private or public drinking-water system
- A reasonably expected potential future source of drinking water

There are 18 criteria embedded within the three factors and the assessment shows that all of the technical requirements for assignment of a non–drinking-water classification can be met.

Groundwater beneath the study area is not a current source of drinking water, and it is not within a zone of contribution, a recharge area, or a wellhead protection area for a drinking-water system. It is also not expected to be a future drinking-water source because of its poor natural water quality as defined by elevated electrical conductivity, total dissolved solids, and chloride concentrations. At a few locations, the groundwater falls within the federal "exempt aquifer" classification—it is not a suitable drinking-water source. Groundwater on the eastern side of the study area has the best overall quality, but it is locally impacted by floating fuel associated with the ATCO dormitory. Further, the aquifer is relatively close to the land surface and the freshwater layer is thin. These factors increase its susceptibility to contamination, reduce its potential yield to a low level, and provide little capacity to dilute any contamination. The exposure path to humans is limited unless wells are drilled or excavations extend to the groundwater. The ecological risk is likely to be low given the size of Village Cove, the fact that the primary contaminants are fuels, and the likely low flux of groundwater into the harbor.

The National Oceanic and Atmospheric Administration (NOAA) should petition ADEC for a non–drinking-water classification for the Tract 46 study area because it is a reasonable and appropriate approach for establishing cleanup levels in an industrial and commercial area. The 10X Rule does not affect the cleanup levels for the ingestion and inhalation exposure pathways. Thus, adoption of the 10X Rule will not alter or change the level of protection for individuals coming into contact with the soil or any vapors from the soil. As an additional safeguard to public health, NOAA should consider discussing land-use restrictions with the city of St. Paul and attaching deed restrictions on any land transfers; these restrictions should prohibit using groundwater or removing soil from the study area.

Preface

This report contains the results of Mitretek's analysis of Alaska state regulations and guidance, along with hydrogeological and chemical data from publicly available sources and from various contractors who have worked in the Pribilof Islands. Much of the contractor data used in this evaluation was reviewed in draft form. Regulatory documents and guidance were typically obtained over the Internet from state and federal agencies. The Internet addresses cited in the document and reference list were checked and found to be valid at the time of publication, but there is no assurance that these addresses will remain valid in the future. Time and staffing limitations precluded the analyst from validating every piece of data. The interpretations contained herein are based solely on the data provided to Mitretek. Questions or concerns about specific data or information used in this report should be directed to the source(s) noted on the tables, figures, and in the text.

Mitretek has attempted to correctly apply the promulgated regulations and guidance of the state of Alaska in developing the groundwater classification. However, the application of the regulations is subject to a final determination by the Alaska Department of Environmental Conservation. Mitretek has held discussions with persons knowledgeable in this area, but there is no assurance that the interpretation and application of the material presented within the report will be in complete harmony with the Agency's interpretations. In addition, public consultation is an important part of the process, and the public may or may not agree with the Mitretek conclusions and recommendations.

The conclusions and recommendations in this report are based on the materials presented and referenced in the report and reflect the technical assessment and opinion of the Mitretek staff. Although this report was prepared for the Pribilof Project Office within the National Ocean Service, a division of the National Oceanic and Atmospheric Administration, it may not reflect in whole or in part the position of the agency.

Mr. John K. Miller of Mitretek Systems conducted the review. As part of this assessment, Mr. Miller reviewed and analyzed the documents listed in the Reference List concerning groundwater distribution, use, quality, and classification on the Pribilof Islands, focusing on St. Paul Island in particular.

Table of Contents

Section		Page
1	**Introduction**	**1-1**
1.1	Background	1-1
1.2	Purpose and Approach	1-2
2	**Groundwater Use Classification**	**2-1**
2.1	Regulatory Framework and Guidance	2-1
2.2	Background Setting and General Patterns of Contamination	2-4
3	**Tract 46 and Vicinity, St. Paul Island**	**3-1**
3.1	Factor 1–Current Groundwater Use at the Site	3-1
3.2	Factor 2–Probability for Use as a Future Drinking Water Source	3-2
3.3	Factor 3–Transport of Contaminants into Areas Beyond the Site	3-12
4	**Conclusions and Recommendations**	**4-1**
List of References		**RE-1**
Appendix	**Additional Information**	**A-1**
Glossary		**GL-1**

List of Tables

Table		Page
2-1	Groundwater Use Factors and Criteria	2-3
2-2	ADEC Guidance and Considerations for Assessing Groundwater Use and Implementation of the 10X Rule	2-4
2-3	Soil Cleanup Levels for Hydrocarbons under the 10X Rule as compared to ADEC Cleanup Levels in Tables B1 and B2	2-9
2-4	Selected Groundwater Results for Monitor Wells in the Village Hill Area	2-11

Section 1

Introduction

1.1 Background

The Pribilof Project Office (PPO) of the National Oceanic and Atmospheric Administration (NOAA) is responsible for site characterization and restoration activities on St. Paul and St. George Islands, Alaska. These responsibilities arose through ownership and operation of land and facilities by NOAA and its predecessor agencies. Public Law (PL) 104-91 provides the mandate for site characterization and restoration activities on both islands. An agreement between NOAA and the Alaska Department of Environmental Conservation (ADEC), known as the Two-Party Agreement (TPA), was signed 26 January 1996. The TPA provides the framework for investigating and remediating many of the sites recognized in PL 104-91.

Under the TPA, 15 sites were identified on St. Paul Island and 25 sites on St. George Island. However, some TPA sites included numerous discrete source areas or sites with distinct bounds of contamination or debris. For example, TPA Site 9, also known as Tract 46, has had 16 distinct soil-contaminated sites identified by investigations subsequent to the signing of the TPA. In addition, other distinct sites not recognized during the preparation of the TPA have been added to the list of sites necessitating cleanup under PL 104-91. Based on surface debris and soil contamination, NOAA presently recognizes 84 sites—52 on St. Paul Island and 32 on St. George Island. At TPA Site 9, the majority of sites with groundwater contamination appear to be connected to a common groundwater contaminant plume consisting of fuel related substances.

The focus of this report is the groundwater beneath the general area of TPA 9 and TPA 12 on St. Paul Island. The study area was defined to include the bulk of the sources and sites of soil and groundwater contamination within the industrial and commercial portions of the city of St. Paul. The contamination identified in soils and groundwater is associated with a large number of current and historic aboveground and underground storage tanks (ASTs and USTs) and fuel transfer lines. The study area includes several different tracts of land, including all of Tract 46, Tract 43, and Parcel 6f and the portion of Tract A north of Bartlett Avenue and west of the Airport Road (Figure 1-1). The total area is approximately 45 acres and includes the primary industrial and commercial sections of the city.

The classification effort included examination of all available hydrogeological information and chemical data for soils and groundwater within the general study area. Although the groundwater use classification may be viewed primarily as a method for determining the cleanup level for groundwater, it also impacts soil cleanup levels where the pertinent soil cleanup value is determined by the potential migration of contaminants to groundwater.

Under the State of Alaska Administrative Code (AAC), there are several regulations that address the disposal and cleanup of oil and other hazardous substances. The primary regulations governing soil and groundwater cleanup and groundwater-use evaluations are

contained in 18 AAC 75, Sections 325 through 390. The ADEC regulations presume that groundwater is a drinking-water source unless shown otherwise. Because groundwater and soil remediation can be complex and must include consideration of many factors, the ADEC regulations offer four methods for establishing cleanup levels. These methods range from simple (Method 1) to increasingly more complex, requiring detailed site-specific information (Method 4). The four methods use predetermined levels set out in tables, simple calculations, or complex risk assessments.

After reviewing the methods for establishing cleanup levels, Mr. John Lindsay, the NOAA Pribilof Program Manager, tasked Mitretek Systems to assess the shallow groundwater in the vicinity of Tract 46 and determine whether the groundwater is a current or potential drinking-water source. This approach was determined to be the best option because it can be evaluated with existing data at low cost and has the potential to increase the ADEC cleanup levels tenfold for soil and groundwater while remaining protective of human health and the environment.

1.2 Purpose and Approach

The purpose of this review is to examine the ADEC regulations and guidance on groundwater usage and to determine whether the groundwater underlying the Tract 46 study area on St. Paul Island could support a non–drinking-water classification. If groundwater in the Tract 46 study area were accepted by ADEC as a non–drinking-water source, it would allow usage of the 10X Rule for groundwater remediation and protection and could also increase the required cleanup level for some soil contaminants by a factor of 10.

Mitretek approached the assessment by examining the publicly available hydrogeologic data available for St. Paul Island and other hydrogeologic data supplied by NOAA contractors, primarily Columbia Environmental Sciences, Inc. (CESI). The assessment focuses on the general vicinity of Tract 46, but it also includes information on the existing public supply wells. The public supply wells were examined to determine whether there is a hydraulic connection between the study area and the public wells or the area in which any potential future public wells might be located. The report identifies the critical watershed areas and potential locations for future supply wells that have been recommended by the U.S. Geological Survey (USGS) and the Alaska Department of Natural Resources (ADNR). These areas are critical to ensure protection of drinking-water resources. It is also important to compare the characteristics of the groundwater within the current well field to the Tract 46 study area to determine whether the groundwater in the study area is similar to the water in the well field and could be used as a future potential source of groundwater.

The goal of the groundwater use classification effort is to assign a single groundwater use class to the study area. Although the study area contains numerous release locations, Mitretek believes that the study area should be treated as a single area of concern for the following reasons:

- The study area is relatively small (45 acres).
- There are numerous release locations and potential sources within the study area.

- All the sources have a common type of contamination—petroleum.
- Groundwater plumes from several sources have commingled to form a single plume.

The approach used is based on the average or the weight of evidence for the area as a whole. However, it is possible that within the study area one could also find isolated locations where the data may appear to support a different use classification, but these areas are relatively small, no more than a few acres. Where these isolated exceptions are present, they are pointed out in the report and discussed to provide the full range of conditions for the reader.

Many of the figures in the report are modified versions of draft figures produced by CESI and are noted as such on the report figures where appropriate. In other cases, figures were created from data contained within draft reports. For example, Figures 3-1 through 3-5 were created using field data gathered by CESI.

The most recent groundwater information was supplied by IT Alaska, Inc. (IT) in a series of quarterly groundwater monitoring reports and this information was used to support the patterns shown in the CESI figures (IT, 2002a through 2002d). However, for each sample round, the groundwater patterns vary and the patterns shown in the report may not fully represent current conditions. The approach for groundwater relied on an examination of all of the groundwater analytical data and determining which monitor wells generally contain contaminant concentrations above potential ADEC cleanup criteria. Because the number of groundwater samples for each well are relatively few (<5), any well with a single valid contaminant concentration above the potential ADEC cleanup criteria has been considered as contaminated for the purpose of this study. An example of the approach can be found in the data presented in Section 2.2 where the variation in chromium concentrations is discussed. The contaminant patterns presented in the figures are believed to adequately represent the general areas of contamination in soil and groundwater and are suitable for use in groundwater classification decisions.

Infrequent or unusual contaminants were evaluated, but they are not included in this report because they do not have a significant impact on the general contaminant patterns in groundwater or soil. In almost all cases, these contaminants appear within the boundaries of the more dominant fuel contaminants. In a few cases, the validity of the contaminant or its concentration is questionable. These isolated occurrences are not important in determining the groundwater class and are not discussed in this report.

Section 2

Groundwater Use Classification

2.1 Regulatory Framework and Guidance

The ADEC regulations allow for the modification of groundwater and soil cleanup levels from those presented in tables within 18 AAC 75; modifications would be based on site-specific conditions, including current and future groundwater use and exposure scenarios. Groundwater use is evaluated using 18 AAC 75 (Sections 345 and 350) and the ADEC Guidance document, *Use of 10X Rule and Risk Assessments to Develop Groundwater Cleanup Levels* (Guidance No. CS/STP 01-01, 27 April 2001). The guidance document provides insight on how to assess the groundwater use criteria and factors and includes a few considerations that are not fully developed within the regulations.

The following discussion on establishing cleanup levels focuses on petroleum hydrocarbon contamination because these substances are the primary contaminants of concern at the sites being investigated by NOAA. Soil cleanup levels can be established using one of four methods (18 AAC 75.340). Factors that may play a role in establishing the site cleanup level include such site-specific conditions as soil type, depth to groundwater, and climate. For soils, the first two methods rely on simple calculations (Method 1, Table A1) or predetermined cleanup values (Method 2, Tables B1 and B2). Method 3 uses a set of equations whose variables can be adjusted using site-specific data to arrive at a cleanup level for petroleum hydrocarbons. Method 4 is based on a site-specific risk assessment.

Method 2 soil cleanup levels are based on three potential routes of exposure: inhalation, ingestion, and migration to groundwater. The regulations require selection of the cleanup criteria that are most stringent (18 AAC 75.340). Often, the migration to groundwater cleanup level is the lowest and must be selected. Thus, evaluation of groundwater use is especially important for soil cleanup when the required soil cleanup level is used to protect groundwater from leaching or migrating contaminants.

Groundwater cleanup levels are discussed in 18 AAC 75.345. Cleanup levels can be established using one of three methods:

- Use a set of standard values listed in Table C of 18 AAC 75.345.
- Develop site-specific values using risk assessment procedures (18 AAC 75.340 and 345).
- Multiply the standard values found in Table C of Method 2 by 10 (referred to as the 10X Rule) if an assessment of groundwater use determines that (1) groundwater at the site is not a current or potential drinking-water source as outlined in 18 AAC 75.350 and (2) the cleanup levels in Table C are met at the property boundary where the current or reasonably expected potential future use of groundwater in the neighboring property is a drinking-water source, unless an alternate point of compliance is approved.

Alternatively, ADEC can be petitioned for a waiver or modification of the site cleanup rules (18 AAC 75.390), but there is no likely reason for a petition; it is unlikely that ADEC would grant such waivers without good cause. Thus, this option is not a likely possibility.

The regulations recognize that groundwater that is not likely to be used as drinking water does not need to be remediated and protected as rigorously as current drinking-water source areas or areas that could be future drinking-water sources. For example, if the groundwater is not a current or a likely future source of drinking water and is not hydraulically connected to the drinking-water supply such that contaminants can reach and impact the existing drinking-water supply, then cleanup levels in Table C may be increased by a factor of 10. Further, the soil cleanup levels that are designed to protect groundwater under Method 2 (Tables B1 and B2) can also be modified by the same factor of 10 if ADEC agrees that the modified groundwater cleanup levels are protective of human health and the environment. However, the 10X Rule "only applies to ***contaminated*** groundwater—cannot apply 10X Rule if groundwater is not affected" (see the Appendix, ADEC Training slides, May 2001). Sites that have not released contaminants to groundwater at concentrations above the Table C levels have not—by ADEC definition—contaminated groundwater and are not available for evaluation under the 10X Rule. Further, the 10X Rule is restricted to those compounds detected in groundwater that meet the ADEC definition of contamination, that is, they exceed the Table C cleanup levels. Although the Tract 46 study area contains numerous sites and potential sites, the close proximity of these individual sites and the similarities between them suggests that the entire Tract 46 study area can be treated as a single site.

The 3 regulatory factors and 18 criteria used in the evaluation are reproduced in Table 2-1. Other items and issues that should be addressed can be found in the ADEC guidance and the May 2001 training slides referenced above. These items and issues are summarized in Table 2-2. A copy of the guidance document and the portion of the training slides on groundwater classification are included in the Appendix. The complete set of training slides can be found at http://www.state.ak.us/dec/dspar/csites/ind_docs.htm.

The three factors can be broadly grouped into assessments of the following:

- Current groundwater use at the site
- Potential for future groundwater use as a drinking-water source at the site
- Transport of contaminants from the site into areas currently used or with a potential for future use as a source of drinking water

The 3 factors and the 18 criteria, along with the ADEC guidance, are presented and discussed in detail in Section 3. An examination of Tables 2-1 and 2-2 will show that many of the items have a similar nature. Nevertheless, they have been kept separate to maintain clarity. Where sufficient similarity is present, a cross reference is provided between the factors.

The terms "site" and "contamination" are important concepts, and Mitretek has adopted the following ADEC definitions in this report:

> A site is an area that is contaminated, including areas contaminated by the migration of hazardous substances from a source area, regardless of property ownership (18 AAC 75.990[115]).

Table 2-1. Groundwater Use Factors and Criteria

Groundwater at the site is considered to be a drinking water source unless a responsible person demonstrates or the department determines that

(1) The groundwater is *not*:

(A) Used for a private or public drinking water system

(B) Within the zone of contribution of an active private or public drinking water system, or

(C) Within a recharge area for a private or public drinking water well, a wellhead protection area, or a sole source aquifer;

(2) The groundwater is not a reasonably expected potential future source of drinking water, based on an evaluation of:

(A) The availability of the groundwater as a drinking water source, including depth to groundwater, the storativity and transmissivity of the aquifer, the presence of permafrost, and other relevant information;

(B) Actual or potential quality of the groundwater, including organic and inorganic substances, and as affected by background, saltwater intrusion, and known or existing area wide contamination;

(C) The existence and enforceability of institutional controls described in 18 AAC 75.375 or municipal ordinances or comprehensive plans that prohibit or limit access to the groundwater for use as drinking water;

(D) Land use of the site and neighboring property, using the factors in EPA's *Land Use in the CERCLA Remedy Selection Process*, adopted by reference in 18 AAC 75.340;

(E) The need for a drinking water source and the availability of an alternative source; and

(F) Whether the groundwater is exempt under 40 CFR 146.4, revised as of July 1, 1997, and adopted by reference; and

(3) The groundwater affected by the hazardous substance will not be transported to groundwater that is a source of drinking water, or that is a reasonably expected potential future source of drinking water, in concentrations in the receiving groundwater that exceed the groundwater cleanup levels; in reviewing the demonstration required under this paragraph, the department will consider

(A) The areal extent of the affected groundwater;

(B) The distance to any existing or reasonably anticipated future water supply well;

(C) The likelihood of an aquifer connection due to well construction practices in the area where the site is located;

(D) The physical and chemical characteristics of the hazardous substance;

(E) The hydrogeological characteristics of the site;

(F) The presence of discontinuities in the affected geologic stratum at the site;

(G) The local climate;

(H) The degree of confidence in any predictive modeling performed; and

(I) Other relevant information; the department will request additional information if the department determines that the information is necessary to protect human health, safety, or welfare, or the environment.

Source: 18 AAC 75.350

Table 2-2. ADEC Guidance and Considerations for Assessing Groundwater Use and Implementation of the 10X Rule

1.	If the department determines in consultation with each site landowner, the public, and appropriate government officials, that the groundwater is not a current or a reasonably expected potential future source of drinking water based on an evaluation of factors in 18 AAC 75.350, then 10 times the applicable groundwater cleanup level applies throughout the contaminant plume
2.	If the 10X Rule applies, the soil migration to groundwater cleanup levels can be adjusted because the relationship between the Table C cleanup levels and the migration to groundwater cleanup level is linear
3.	The department must also consider whether a risk assessment is necessary to evaluate other exposure pathways, such as volatilization of contaminants into structures, and impacts to ecological receptors
4.	Free product needs to be recovered to the maximum extent possible in accordance with 18 AAC 75.325(f)(B) or 18 AAC 78.240(b)(2)
5.	Surface water and sediment quality standards in 18 AAC 70 must be met if the groundwater is closely connected hydrologically to surface water
6.	Table C levels apply off the affected property unless the department has also approved 10X Table C levels for those properties
7.	The risk for the site will not exceed the cumulative risk management levels for human health or ecological receptors
8.	Implement institutional controls as required by 18 AAC 75.375(a)
9.	The soil cleanup level for migration to groundwater is 10X Tables B1 and B2 (Method 2)

Source: ADEC Guidance Document No. CS/STP 01-01

> Contaminated soil and contaminated groundwater means soil or groundwater containing a concentration of a hazardous substance that exceeds the applicable cleanup level determined under the site cleanup rules (18 AAC 75.990[22] and [23])

The study area has been treated as a single site containing numerous sources. The areas identified in the figures as contaminated soil are based on ADEC Table B2 petroleum hydrocarbon values for migration to groundwater and background values for metals. Groundwater contamination is based on the cleanup levels in Table C for petroleum hydrocarbons and metals (see 18 AAC 75 Sections 340 to 345).

2.2 Background Setting and General Patterns of Contamination

This section examines the basic hydrogeologic setting of St. Paul Island, the general areas of contamination, and the locations of current and possible future drinking-water wells. The contamination involves releases of diesel fuel, gasoline, and used motor oil and hydraulic fluids through spillage, dumping, and leakage from various containers, including drums, pipes, ASTs, and USTs. Features relevant to the understanding of groundwater presence, movement, and classification are discussed below.

St. Paul Island is a relatively young, volcanic island formed by a series of volcanic eruptions along vents and fissures. The basalt consists of relatively thin (1–3 feet) to moderately thick (~20 feet) lava flows and sills emplaced during the late Pleistocene. Cinder cones with associated scoria and pyroclastic debris are present and are readily recognizable topographic

features. These topographic features help direct groundwater flow and movement. The groundwater is typically unconfined, and the groundwater surface crudely mimics the topographic surface. The volcanic features appear to be complex and heterogeneous, and they exhibit rapid changes over relatively short distances. There are also interbedded glacial and marine sediments within the volcanic flows. Extensive windblown sand dunes can be found along the southern edge and northeast corner of the island. Examples of these features can be found within the study area, and they combine to create a complex groundwater system.

The lava flows commonly have rough surfaces covered with scoria, and the number and size of the vesicles or air bubbles increases near the surface of the flow. The lower portions of the flows are typically more massive and compact but frequently fractured or jointed. These features result in high primary horizontal porosity along flow contacts. The fractures in the lava flows result in significant secondary porosity that allows groundwater to move easily between flow units.

The climate is typical subarctic marine with a relatively narrow range of temperatures, averaging slightly above freezing. Despite the relatively cold average temperatures, most of the precipitation occurs as rain. Summer temperatures rarely exceed 50°F, and winter temperatures are usually 10-25°F; however, periods of subzero temperatures can occur. Precipitation averages slightly less than 24 inches per year. Cold temperatures (40–50 °F) and abundant cloud and foggy conditions typify the summer months. The generally windy conditions that often prevail tend to increase evaporation, but the persistent cloud and fog cover tends to offset the effects of the wind. Thus, compared to the continental United States, evapotranspiration is relatively low on St. Paul Island. About 80 percent, or 19 inches, of the precipitation is available for infiltration through the porous alluvium and bedrock materials (CESI, 1999).

Groundwater generally occurs within a few feet of sea level, and only one potential aquifer is present. The aquifer occurs in a wide range of materials ranging from relatively clean, unconsolidated, aeolian sands to fractured basaltic bedrock and scoria. Groundwater appears to be unconfined with flow following recognizable geologic and topographic features. Flow is believed to be locally complex and may be controlled by secondary bedrock features such as numerous fractures. Because groundwater generally flows from higher to lower topographic areas, the general flow direction is outward towards the edges of the island.

Groundwater is present as a lens of freshwater floating on the slightly more dense seawater. The contact between freshwater and seawater is marked by a variably thick transition or mixed zone between the two. Theoretically, for every foot of freshwater above sea level there is approximately 40 feet of freshwater, based on the Ghyben-Herzberg relationship. However, this relationship is based almost entirely upon the density difference between freshwater and seawater and it generally underestimates the depth to saltwater. The contact between fresh and saltwater has not been directly investigated on St. Paul Island, but it is inferred based on the general island model—the Dupuit-Gyhben-Herzberg model.

Other factors such as the infiltration rate, hydraulic conductivity, and barriers to flow can greatly impact the shape and configuration of the freshwater lens. In addition, the volume of

freshwater present is hard to predict because it is largely dependent upon how well secondary porosity has been developed in the volcanic bedrock. The volcanic flows may contain intervening and discontinuous beds of scoria and some sediments. Groundwater quality and yields are variable, and in some places, saltwater has intruded vertically and horizontally into the freshwater zone through natural processes or has been induced by pumping activities for commercial reasons.

The horizontal extent of the freshwater is expected to mimic and follow the shoreline, but known areas of saltwater intrusion or up-coning have been identified within the town. In general, groundwater is present in the fractured lava flows and associated scoria as an unconfined or semi-confined aquifer of variable thickness and quality whose potential sustainable yield is highly variable.

The hydrogeological setting of the study area generally consists of surficial sands and gravels overlying basalt flows and boulders. In the eastern and northern portions of the study area, groundwater is contained within sandy units or fill materials at relatively shallow depths. In the middle and southern portion of the study area, groundwater may be found in sandy mud, in basalt flows, or in boulder-rich mixtures of sand and mud. The southwestern portion of the study area is centered on Village Hill where elevations rise to about 100 feet. Geologic materials beneath Village Hill consist of a thick sequence of pyroclastic deposits, muddy sands and gravels, and massive to fractured basalt flows.

There is evidence of old abandoned wells extending back before 1900. Many of these historical wells were most likely dug wells and were located near the existing town. All of these wells appear to have been abandoned more than 30 years ago. The reason for abandonment is not known, but is likely to have included supply and water quality limitations. Surface water was also taken from Ice House Lake from the early 1940s until abandonment in about 1960, when development began on the north and south well fields east of Telegraph Hill (Figure 2-1).

The city had only two wells in 1979, but this was increased to four wells in 1986 (Kirkwood and Associates, 1987; USGS, 1980; ADNR, 1994). Within the well field, there are 8 wells, but not all of these wells are used (CESI, 1999). The current public water supply is provided by four wells—Fredreka I, Fredreka II, North, and South wells. The city wells, located about two miles north-northeast of the town, produce about 80–200 gallons per minute (gpm) with only minimal drawdown. The elevation of the top of the freshwater lens at the well field is about 5 feet above sea level; this suggests that about 200 feet of freshwater may be available. Although higher yields can be obtained, high pumping rates are likely to increase saltwater up-coning from below and could render the aquifer useless if over pumped. Disturbance of the boundary between the freshwater and saltwater often takes many years to reestablish.

The catchment area for the well field is largely northwest of the current wells and does not include any of the Tract 46 study area as discussed in Section 3. Fresh groundwater within the study area is not connected to the groundwater that supplies the city drinking-water wells. The general pattern of groundwater elevations and flow directions indicates that groundwater within the Tract 46 study area flows towards and discharges into Village Cove except along the

west side of the study area, where it flows directly into the Bering Sea (Figure 2-2). The elevations shown in Figure 2-2 are in feet above the mean lower low water; this datum is about 2 feet below mean sea level (CESI, 2000). Thus, the water table elevations relative to *mean sea level* are about 2 feet *lower* than the contour values shown on Figure 2-2. The freshwater layer is typically only a few inches to about 2 feet above mean sea level; this suggests that the freshwater layer is likely to be fairly thin.

The general boundaries of the contamination have been delineated in soil and groundwater by recent borings and monitor wells installed by NOAA contractors for the purpose of assessing the nature and extent of the releases. A series of figures produced by CESI were used as the basis for many of the figures in this report. The CESI figures were modified slightly for presentation purposes and the groundwater figures were updated to include the most recent (September, 2001) groundwater sampling results. In other cases, new figures were created using data generated by NOAA contractors. For example, Figures 3-1 through 3-5 were created using field data gathered by CESI.

The primary organic contaminants of concern in soil and groundwater are fuels typified by gasoline range organics (GRO), diesel range organics (DRO), residual range organics (RRO), and benzene. Other fuel and petroleum-related compounds—such as toluene, xylenes, and the polynuclear aromatic hydrocarbons (PAHs)—are rarely reported above cleanup levels in soils or groundwater. The figures do not present the other fuel and petroleum-related compounds because they infrequently exceed cleanup levels and play no role in groundwater classification. The general areas where petroleum compounds occur above potential ADEC cleanup levels in soil and groundwater are shown in Figures 2-3a and 2-4a, respectively. The cleanup values were developed to be protective of long-term exposure in a residential setting. The cleanup levels were taken from ADEC Tables B1, B2, and Table C.

The soil contamination identified in Figure 2-3a is unlikely to be as continuous as shown. The shaded areas represent general locations where one or more soil samples contained petroleum compounds above the levels in Tables B1 or B2. The soil samples come from a wide range of activities, including soil and monitor-well borings, excavations, and hand samples. The figure is intended for groundwater classification purposes only. Other documents will present a more detailed picture of the nature and extent of contamination.

The most common soil and groundwater contaminant is DRO. In soils, GRO and RRO rarely occur over the cleanup levels, and GRO has not been detected above the 10X Rule cleanup level of 1,400 milligrams per kilogram (mg/kg). While DRO is the most common groundwater contaminant, significant concentrations of GRO, RRO, and benzene are also present in groundwater. The lack of GRO in soils relative to groundwater is likely a result of biodegradation and volatilization, coupled with the inherent difficulty of sampling soils for volatile compounds.

In order to show the impact that the 10X Rule could have on the soil and groundwater cleanup levels and the areas of contamination, two new figures were created. Figure 2-3b shows the general locations of petroleum contamination using the soil cleanup levels listed in Tables B1 and B2, as modified by the 10X Rule. Figure 2-4b shows the general areas of petroleum-contaminated groundwater using 10 times the Table C cleanup levels. A comparison of

Figures 2-4a and 2-4b shows that the areas of petroleum-contaminated groundwater are much smaller under the 10X Rule.

Although the 10X Rule increases the Table C groundwater cleanup levels by a factor of 10, the only soil cleanup levels affected are those related to the migration-to-groundwater pathway. The cleanup levels for the ingestion and inhalation pathways in Tables B1 and B2 are *not* affected by the 10X Rule. Thus, adopting the 10X Rule will not change the level of protection provided to those who could come into contact with the soil or soil vapors.

In selecting a soil cleanup level, the ADEC rules require an examination of the cleanup levels for the three possible routes of exposure: ingestion, inhalation, and migration-to-groundwater. For each substance evaluated, the applicable cleanup level is the *lowest* of the three exposure pathways. For many substances, the migration-to-groundwater pathway has the lowest cleanup level. Although the 10X Rule may increase the migration-to-groundwater cleanup level tenfold, if the value for the migration-to-groundwater pathway rises above either of the other two pathway values, it cannot be selected. This effectively caps the migration-to-groundwater level at the lowest exposure pathway.

An examination of ADEC Tables B1 and B2 shows that for most petroleum-related substances, there will be no change in the soil cleanup levels under the 10X Rule because the lowest possible value is associated with either the ingestion or inhalation exposure pathways. For other compounds, the cleanup level may be increased, but the increase may not necessarily be 10 times the migration-to-groundwater level. For example, the soil cleanup level for GRO is limited to 1,400 mg/kg—about 4.7 times the Table B2 migration-to-groundwater level—because that is the point at which the migration-to-groundwater level equals the inhalation and ingestion cleanup levels. The impact of the 10X Rule on the xylene soil cleanup level is even more limited—the cleanup level increases from 78 to 81 mg/kg.

Under the ADEC regulations, petroleum hydrocarbon cleanup levels must be met for 19 analytes. These include three general classes of hydrocarbons—GRO, DRO, and RRO—and chemical-specific cleanup levels for benzene, toluene, ethylbenzene, and xylenes (BTEX) and 12 PAHs (see note 15 for Tables B1 and B2). Table 2-3 presents the ADEC cleanup levels for these 19 analytes by exposure pathway and includes the impact, if any, of the 10X Rule. As noted earlier, the 10X Rule only applies to those compounds found in groundwater with concentrations exceeding the values listed in Table C. A current list of these compounds can be found in the Appendix. If future groundwater investigations or sampling reveal other compounds above the levels in Table C, then NOAA should submit the new data along with a letter requesting that the compounds be added to the list.

Only 4 of the 12 PAH compounds are affected by the 10X Rule. The remaining PAHs are unaffected because the lowest cleanup level occurs in the ingestion pathway. A comparison of the cleanup levels for hydrocarbon compounds in soils impacted by the 10X Rule is also presented in Table 2-3. Although many of the inorganic or metal cleanup values would also increase under the 10X Rule, they are not shown because they are generally believed to be relatively unimportant within the Tract 46 study area.

Table 2-3. Soil Cleanup Levels for Hydrocarbons under the 10X Rule as compared to ADEC Cleanup Levels in Tables B1 and B2

Analyte	Soil Cleanup Level under the 10X Rule	Cleanup Levels by Exposure Pathway (Under 40 inch Precipitation Zone)			Is the 10X Rule Soil Cleanup Level Limited?
		Migration to Groundwater	Ingestion	Inhalation	
Petroleum Compound Classes					
Gasoline Range (GRO)	1,400	300	1,400	1,400	Yes
Diesel Range (DRO)	2,500	250	10,250	12,500	No
Residual Range (RRO)	10,000	11,000	10,000	22,000	Yes
Fuel Compounds (BTEX)					
Benzene*	0.2	0.02	290	9	No
Ethylbenzene	55	5.5	10,000	89	No
Toluene	54	5.4	20,300	180	No
Xylenes	81	78	203,000	81	Yes
Polynuclear Aromatic Hydrocarbons (PAHs)					
Acenaphthene	2,100	210	6,100	nl	No
Anthracene	30,000	4,300	30,000	nl	Yes
Benzo(a)anthracene	11	6	11	nl	Yes
Benzo(b)fluoranthene	11	20	11	nl	Yes
Benzo(k)fluoranthene	110	200	110	nl	Yes
Benzo(a)pyrene	1	3	1	nl	Yes
Chrysene	1,100	620	1,100	nl	Yes
Dibenzo(a,h)anthracene	1	6	1	nl	Yes
Fluorene	2,700	270	4,100	nl	No
Indeno(1,2,3-c,d)pyrene	11	54	11	nl	Yes
Naphthalene	430	43	4,100	nl	No
Pyrene	3,000	1,500	3,000	nl	Yes

Note: All concentrations are in mg/kg or ppm. The 10X Rule increases the migration-to-groundwater cleanup level tenfold, but it *cannot* be selected as the site cleanup level if it is higher than either of the other two exposure pathway values; the lowest level must be selected. Shading identifies the lowest cleanup level under the 10X Rule when the cleanup level is not the migration-to-groundwater value.

*Only two samples (0.23 and 4.1 mg/kg) are reported above the cleanup level under the 10X Rule. However, under the Two Party Agreement the soil cleanup level for benzene is set at 0.50 mg/kg.

nl – not listed in the ADEC tables; unlikely exposure pathway or no data available

Figures 2-5a and 2-5b identify potential sources of contamination within the study area. These sources include both historic and current locations where fuel has been stored in tanks or drums or transported in pipelines. The chlorinated solvent tetrachloroethene (PCE) has been consistently measured at 4–9 micrograms per liter (µg/L) in monitor well MW46-9 near Village Cove. The source of the PCE is unknown, but it is expected to be near MW46-9 because PCE has not been found in any of the upgradient monitor wells.

The inorganic contamination is typically found in the same general areas as the organic fuel contamination. Localized groundwater geochemical conditions may cause some naturally occurring metals to become mobile, and the presence of these metals in groundwater above regulatory standards may not be indicative of a release of these metals to the environment.

A few inorganic substances—such as arsenic, lead, and chromium (Cr)—have also been identified at concentrations that may be above natural background levels in soils or groundwater (Figures 2-6 and 2-7). For soils, arsenic may be present above background, but the background level used for comparison (6.2 mg/kg) may not have been established according to ADEC guidelines and the actual background threshold could be somewhat different. Most of the soil samples shown on Figure 2-6 with "elevated" arsenic concentrations are relatively close to the background threshold. Figure 2-6 is based on a map prepared by CESI; the figure is believed to represent locations where any soil sample, regardless of depth, contains arsenic >6.2 mg/kg. For example, two soil samples from boring SS46-2 contained arsenic at 6.3 mg/kg and 7.4 mg/kg, while a soil sample from MW46-26 contained 7.5 mg/kg at a depth of 12–14 feet. The highest arsenic value in soils (13.4 mg/kg) within Tract 46 was found at 10 feet below ground surface (bgs) during the drilling of MW46-8. It is possible that the area shown in Figure 2-6 could be different once a more definitive background threshold is developed and applied.

Although there is considerable overlap between the higher arsenic concentrations in soil and the areas where groundwater is contaminated by fuels, the arsenic concentrations are only slightly higher than local background concentrations and well within the normal range for many soil types (Boyle and Jonasson, 1973). Arsenic concentrations in fuels and waste oils are typically well below 1 mg/kg (VANR, 1996), and it is unlikely that releases of these substances are responsible for the low levels of arsenic found in the soils.

The four monitor wells shown on Figure 2-7 in the Village Hill area have yielded groundwater samples showing a wide range in Cr and, to a lesser extent, lead values (Table 2-4). Figure 2-7 was taken from a draft CESI figure that appears to represent the May 2001 sampling event (CESI, 2001b); the report did not indicate what sample round was shown. The data in Table 2-4 clearly demonstrate that the general Cr pattern shown in Figure 2-7 has varied with each sample round. In fact, at no time have the 4 wells consistently shown total Cr values above the potential ADEC cleanup criterion of 100 μg/L. The Cr concentrations in the first set of groundwater samples from these 4 wells (June–September 2000) were all below 100 μg/L. In the latest round of samples (September 2001), only MW46-2 at 205 μg/L exceeded the potential ADEC cleanup criterion.

An examination of the boring logs for these four wells suggests that they could produce turbid groundwater if they were not properly developed and sampled. The geologic material encountered in the screened intervals of these four wells is highly variable and ranges from brown fine sand or sand with shell fragments in MW46-1 and MW46-21 to scoria, gravel, ash, fractured basalt, and muddy sands in MW46-2 and MW46-22. The largest range in Cr values is found in MW46-2 and MW46-22; these two wells appear to be screened in finer-grained material (muddy sands) compared to the fine sand found in the other two wells.

Groundwater samples are typically unfiltered and variations in field-sampling technique could result in highly variable amounts of suspended sediment in the groundwater sample. Sample preservation techniques require that nitric acid be added, which is likely to cause metals such as Cr to leach from the suspended soil particles. Careful purging and sampling or low-flow purging and sampling techniques that minimize turbidity are likely to show that groundwater in this area is not impacted by elevated levels of dissolved metals. Alternatively, measurements of turbidity or collection of filtered and unfiltered samples could be used to demonstrate that the metal results are sampling artifacts unrelated to potential releases of hazardous substances or petroleum products.

During September 2001, the four wells at Village Hill (Table 2-3)—plus six wells from outside the study area—were analyzed for total Cr using inductively coupled plasma–mass spectrometry (ICP-MS), and chromium^{+6} (Cr^{+6}) using the colorimetric diphenyl carbazide method (Hach kit), which has a detection limit of 10 µg/L. Groundwater samples from monitor wells MW46-1 and MW46-2 were each reported to contain 10 µg/L of Cr^{+6}, while MW46-21 was non-detect and MW46-22 contained 20 µg/L of Cr^{+6}. There did not appear to be any correlation between total Cr and Cr^{+6} for the 10 samples. The lack of correlation may partly result from the very low Cr^{+6} values (<30 µg/L) and the low sensitivity of the analytical method; it is only readable in 10 µg/L increments. Nevertheless, nearly all the Cr reported is in the trivalent or chromium^{+3} form (Cr^{+3}). The ADEC cleanup criterion for Cr^{+3} is 36,500 µg/L; this may be the more appropriate cleanup criterion.

Table 2-4. Selected Groundwater Results for Monitor Wells in the Village Hill Area

Monitor Well	Date	Cr µg/L	Lead µg/L	Monitor Well	Date	Cr µg/L	Lead µg/L
MW46-1	6/29/00	50	5	MW46-21	10/03/00	19	2
	11/12/00	116	29		11/12/00	14	3
	2/08/01	300	<50		2/08/01 P[1]	26	<50
	5/18/01 B[1]	85	21		5/15/01 P	270	1
	9/03/01 B	29 [10]	7		9/03/01 B	7 [<10]	0.3
MW46-2	9/08/00	8	3	MW46-22	10/03/00	15	6
	11/12/00	11	1		11/12/00	No sample	No sample
	2/08/01 P	95	<50		2/08/01 P	830	<50
	5/15/01 B	440	3		5/22/01 P	5,200	40
	9/03/01 B	205 [10]	2		9/03/01 B	79 [20]	4

Source: Tables 2 and 13, *Draft, Annual Groundwater Monitoring Report*, (IT, 2002d).

NOTE: Values in [ ] are field measurements for Cr^{+6} Information was not available for all sample rounds.

[1] B – sample collected with bailer P – sample collected with Grundfos™ submersible pump.

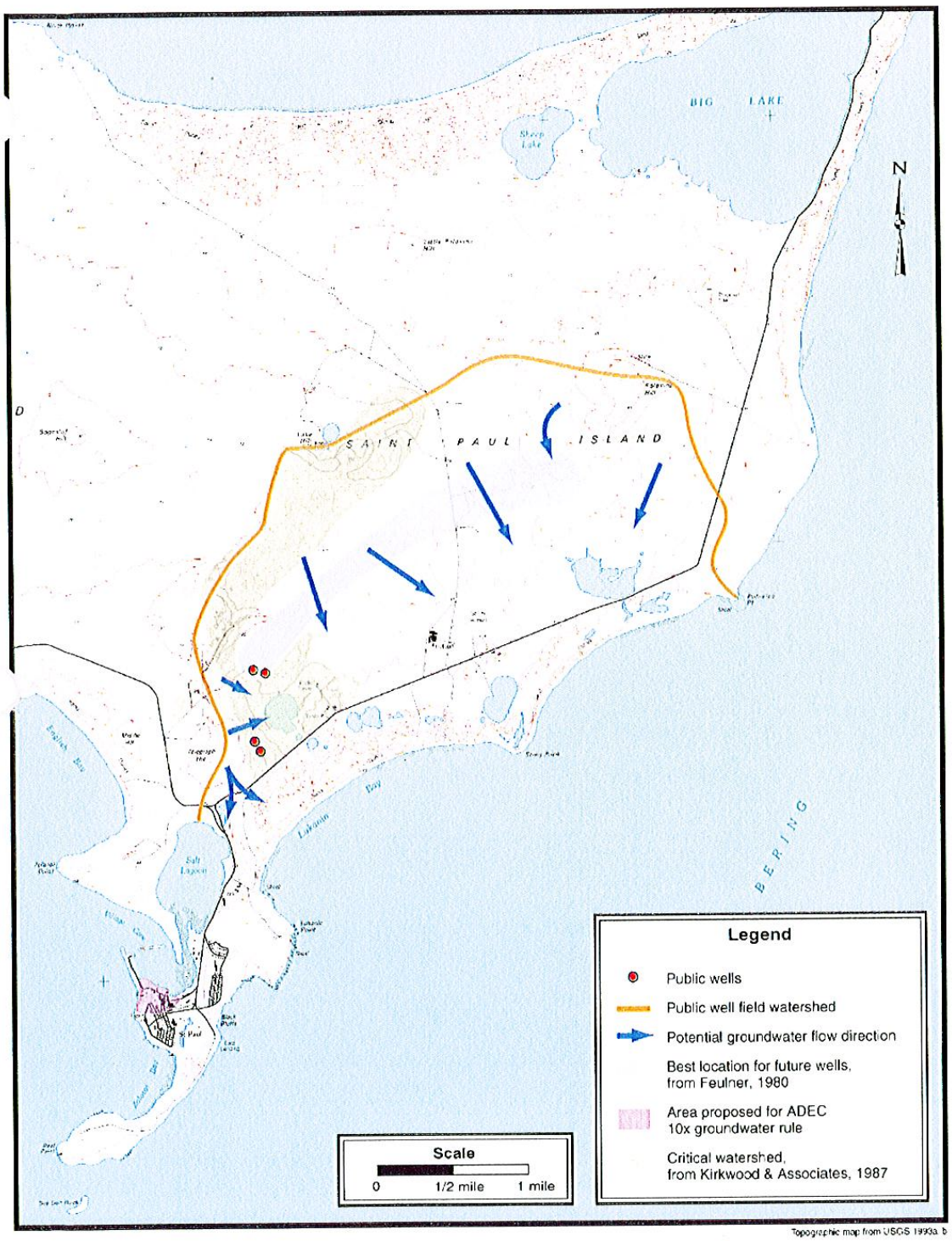
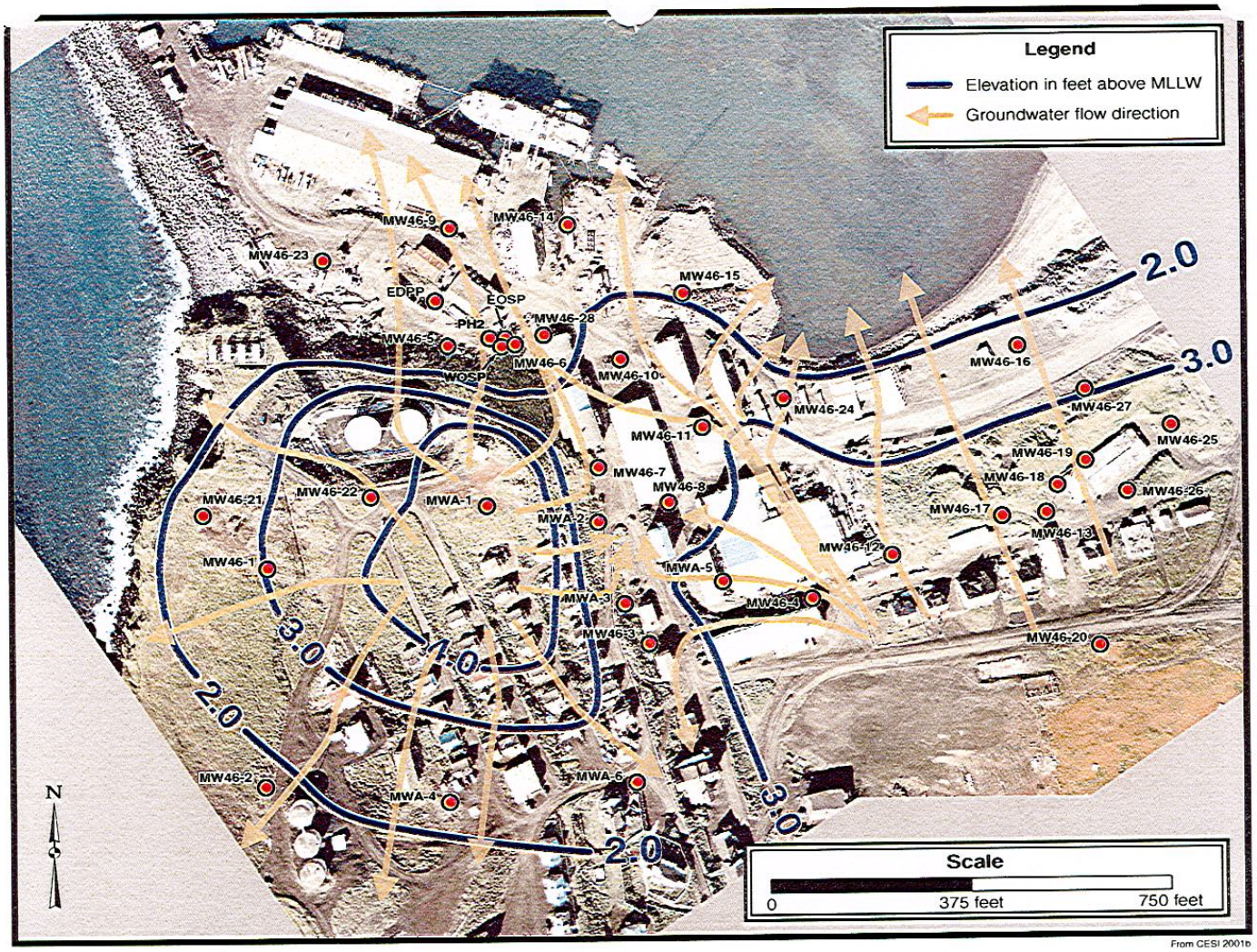
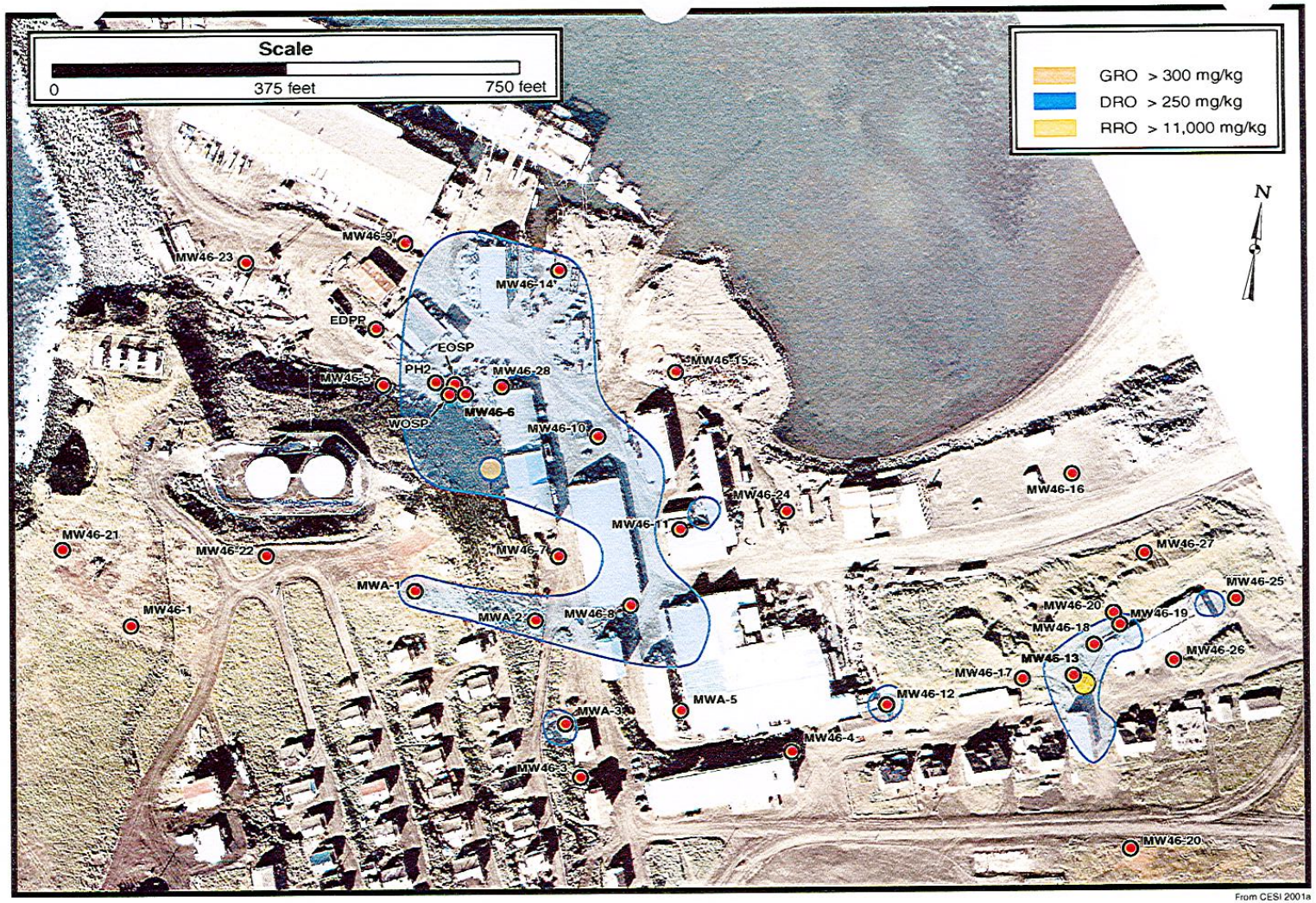


Figure 2-1. Location of the Public Supply Wells and Critical Watershed



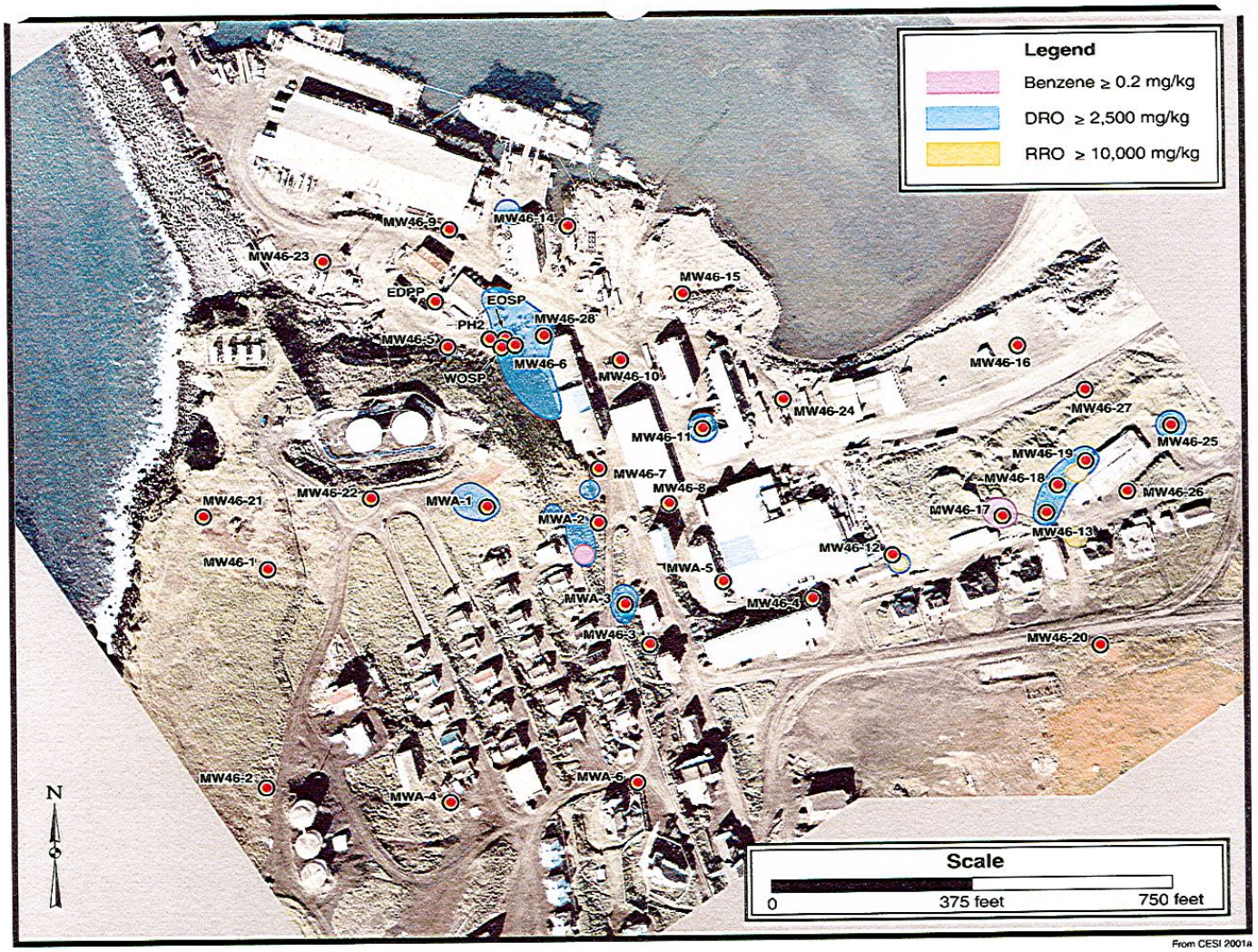
From CESI 2001b

Figure 2-2. General Groundwater Elevations and Flow Directions within the Study Area



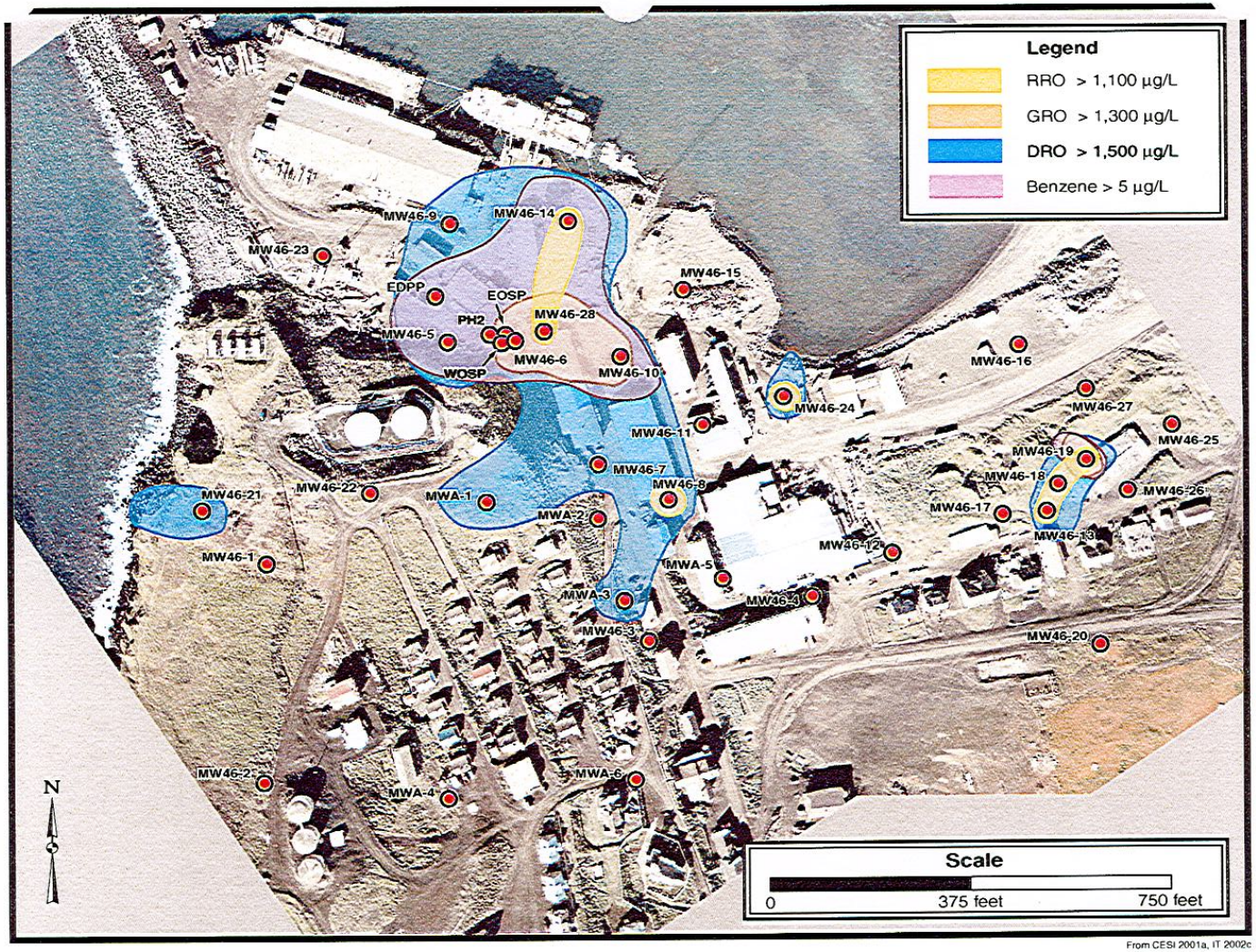
From CESI 2001a

Figure 2-3a. Generalized Areas with GRO, DRO, and RRO in Soils Above Potential ADEC Cleanup Criteria



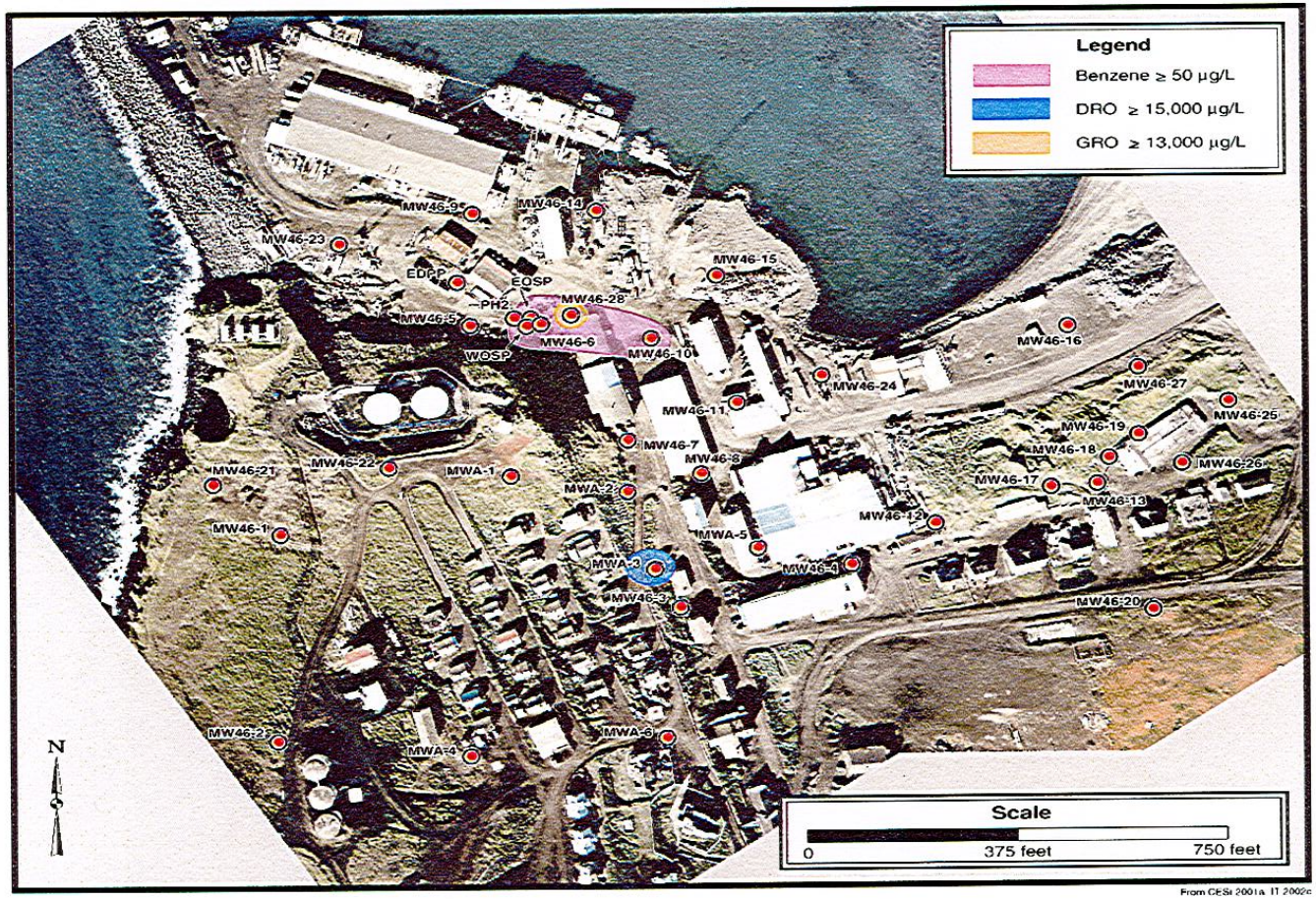
From CESI 2001a

Figure 2-3b. Generalized Areas with DRO, RRO, and Benzene in Soils Above 10x Rule Cleanup Levels



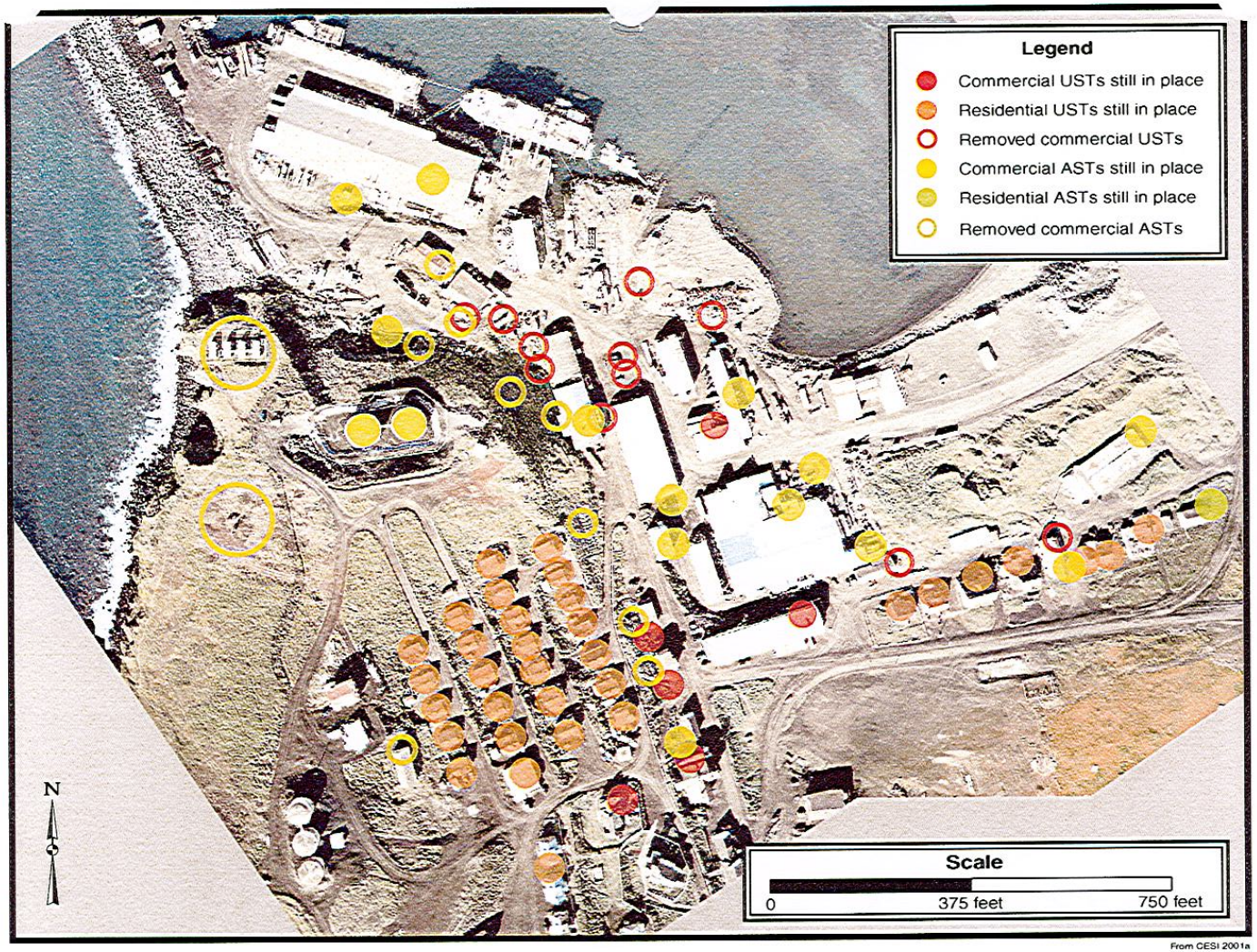
From CESI 2001a, IT 2002c

Figure 2-4a. Generalized Areas with GRO, DRO, RRO, and Benzene in Groundwater Above Potential ADEC Cleanup Criteria



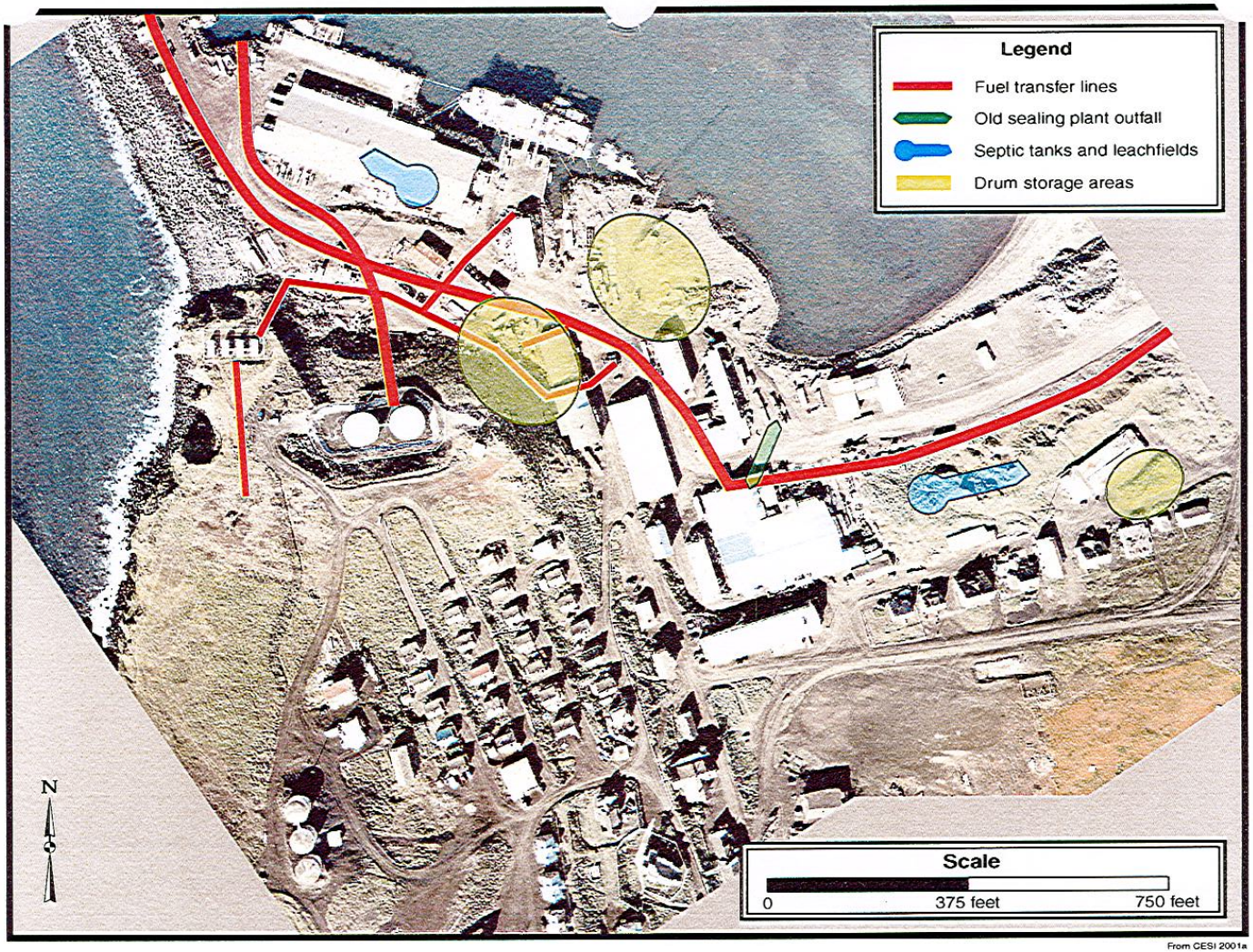
From CESI 2001a, 11 2002c

Figure 2-4b. Generalized Areas with GRO, DRO, and Benzene in Groundwater Above 10x Rule Cleanup Levels



From CESI 2001a

Figure 2-5a. Locations of Potential AST and UST Sources within the Study Area

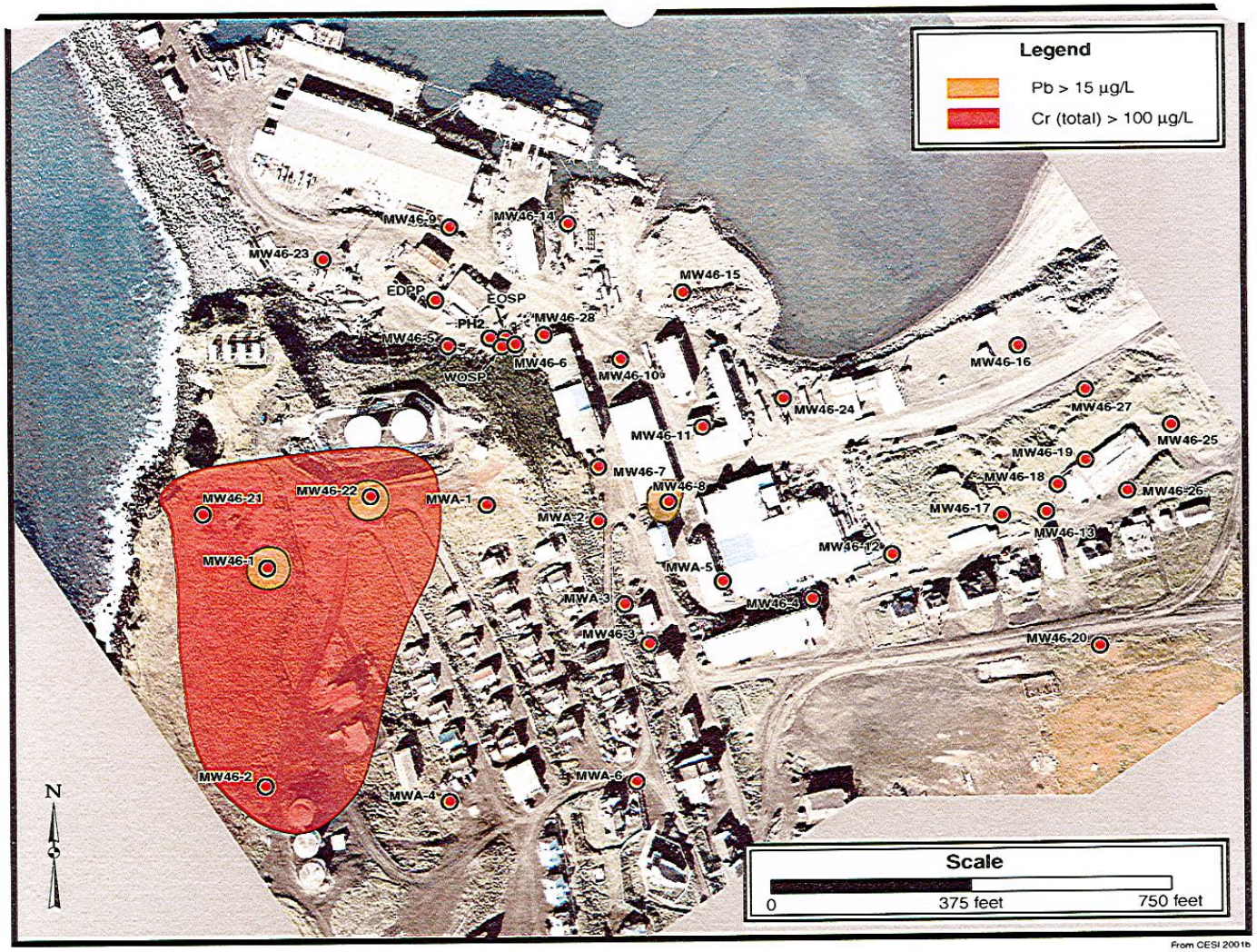


From CESI 2001a

Figure 2-5b. Locations of Other Potential Sources within the Study Area

From CESI 2001a

Figure 2-6. Generalized Areas Where Arsenic in Soil may be Above Background



From CESI 2001b

Figure 2-7. Generalized Areas of Groundwater with Lead and Chromium Above Potential ADEC Cleanup Critieria

Section 3

Tract 46 and Vicinity, St. Paul Island

3.1 Factor 1–Current Groundwater Use at the Site

Factor Summary: Factor 1 was assessed by evaluating items 1A, 1B, and 1C in Table 2-1. The Tract 46 study area appears to meet all the requirements of this factor.

> ⇨ *Criterion 1A*:
>
> Groundwater at the site is not used for a private or public drinking-water system.

Discussions with the city manager in July 2001 and published information on the public water supply system indicate that there are no private drinking-water wells on the island (USGS, 1980; ADNR, 1994). All residents obtain water from the public water supply system whose wells are located about two miles northeast of the city (Woodward Clyde, 1994). The U.S. Coast Guard has its own well just east of the city wells, but the city supply was recently extended to the Coast Guard.

Historical information indicates that several shallow wells were dug or possibly drilled within and near the Tract 46 study area, but these wells were all abandoned many years ago. In the early 1900s, some wells dug in the vicinity of the school and radio building were found contaminated with seal oil and never used. Some wells contained brine, but others provided low yields of potable water. Several old wells were intentionally installed to obtain saltwater from beneath the thin freshwater layer for use in seal processing. Two wells, the east and west wells associated with the Old Sealing Plant (OSP), remain between the Maintenance Garage and the Decommissioned Power Plant (DPP), and two wells are within the DPP. After these wells have served their value for site investigation and remediation, NOAA, as the present federal property manager, will formally abandon these wells. Other old wells in the vicinity were located and sampled, and the old salt-water wells within the study area were confirmed to contain non-potable water (CESI, 1999).

> ⇨ *Criterion 1B*:
>
> Groundwater at the site is not within the zone of contribution of an active private or public drinking-water system.

The zone of contribution (ZOC) has not been delineated for the drinking-water supply wells. The ZOC is typically based on the pumping rate, the standard groundwater hydraulic parameters (such as hydraulic conductivity and transmissivity), and possibly a certain number of years of pumping. If a ZOC were defined for the city wells, it would be contained within the groundwater basin shown in Figure 2-1. Such a ZOC would not include any of the groundwater within the study area, which flows towards the harbor or the Bering Sea (Figure 2-2). The potential ZOC for the city wells would include the area north and northwest of the wells. Kirkwood and Associates (1987) delineated the critical watershed needed to

support the existing well field. They also identified the area around the current well field as suitable for any future wells, as reported in a site inspection report (Woodward Clyde, 1994). Groundwater flow within the study area is not towards or connected to the groundwater basin or watershed containing the city wells (Figure 2-1). The watershed containing the city wells was delineated by a NOAA contractor (CESI, 1999); their draft map showed that the city wells are located in the southwestern corner of the watershed, far from the study area. There are no private drinking water wells within the study area.

⇨ *Criterion 1C:*

Groundwater at the site is not within a recharge area for a private or public drinking-water well, a wellhead protection area, or a sole-source aquifer.

The study area is not within the recharge area for any drinking-water well, public or private, and it is far removed from the municipal well field, as discussed under criterion 1B. The recharge area for the municipal wells can generally be estimated based on topography and the limited water elevation data that are available. The recharge area is based on the assumption that groundwater is largely unconfined and that the water elevations and gradients generally follow the land surface topography. These assumptions appear valid for much of St. Paul Island. The recharge area for the municipal wells includes the possible ZOC discussed above and may also include areas where surface water is brought into the ZOC and recharges the aquifer. Thus, the recharge area can be broadly approximated as that portion of the watershed overlying or feeding into the possible ZOC. The groundwater supplying the municipal wells is completely separate and distinct from the groundwater within the study area (Figure 2-1).

A wellhead protection area has not been established for the municipal wells, but if one were established, it would be smaller than and within the critical watershed shown in Figure 2-1.

The aquifer has not been designated a sole source aquifer based on a search of the Region 10 records of the U.S. Environmental Protection Agency (EPA). The search of the EPA web site also revealed that there are no pending applications for a sole-source aquifer designation at EPA (http://www.epa.gov/safewater/swp/ssa/reg10.html).

3.2 Factor 2–Probability for Use as a Future Drinking Water Source

Factor Summary: Factor 2 was assessed by evaluating criteria 2A through 2F in Table 2-1. The study area meets all of the requirements of this factor.

⇨ *Criterion 2A:*

The availability of the groundwater as a drinking-water source, including depth to groundwater, storativity and transmissivity of the aquifer, presence of permafrost, and other relevant information

Although there are several components to criterion 2A, they are all concerned with how easy the groundwater at the site can be developed and the ability of the aquifer to provide a drinking-water supply in terms of yield and available volume of water.

Availability of Groundwater as a Drinking-Water Source

Information published by government agencies (USGS, 1980 and ADNR, 1994) and draft reports prepared by NOAA contractors (CESI, 2000, 2001b) were used to evaluate the availability of groundwater at the site and, in more general terms, as a source of drinking water. Groundwater is readily available on the island at depths that range from a few feet to several hundred feet, depending upon the topography. There are no permanent streams (Kirkwood and Associates, 1987) within or near the study area.

Several small ponds and a few relatively large lakes can be found northeast of the city. The largest lake is Big Lake at the northeast corner of the island, but it is more than seven miles from the city. Although several of the small lakes were used for drinking water in the past (CESI, 1999), most lakes do not appear to contain sufficient volume to provide a secure and certain annual supply (USGS, 1980). In addition, some lakes are ephemeral, and all are subject to freezing; they would have little recharge during a large part of the year. Surface water also generally requires more treatment than groundwater to minimize bacteriological contaminants. The close proximity of the largest lakes to the ocean and the hydrologic connection between the lakes and the ocean suggests that the lakes could be impacted quickly by saltwater intrusion if large-scale pumping were to occur. The lakes were not seriously considered by the USGS in their study as alternative supplies because groundwater resources in the area of the existing city well field are more than adequate for current needs. Thus, groundwater is the only current and reliable source of drinking water on the island. However, in discussions with community members, NOAA indicated that any industrial use of freshwater—such as in a meal production facility—would overwhelm the current well field.

The city's well field is about two miles northeast of the city and the elevation at the top of the freshwater lens is about 4–5 feet above mean sea level. The Dupuit-Gyhben-Herzberg model predicts that for every foot of freshwater above sea level, there is about 40 feet of freshwater below resting on the saltwater. The model suggests that the thickness of the freshwater layer within the city well field could be as much as 200 feet. As noted in the studies conducted by the USGS and the ADNR, the well field has historically supplied about 0.08 million gallons per day (mgd), but this increased to a maximum of about 0.5 mgd with the construction and operation of the fish plant in the 1980s. The USGS (1980) estimated that, in the general area of the current well field, a yield of at least 1.0 mgd could be developed. This is in sharp contrast to the groundwater within the Tract 46 study area where the thickest zone of freshwater is expected to occur in the small area under Village Hill, but even here the average thickness of the freshwater was estimated at 13 feet (CESI, 2001b). Potential yields are high, but substantial quality problems related to saltwater intrusion are likely to occur quickly if withdrawal of water from such a thin layer is attempted.

Depth to Groundwater

Groundwater is generally found at 8 to 25 feet bgs and within a few feet of mean sea level. The depth to groundwater mirrors the topography and is easy to predict. Groundwater depths can be measured using the nearly 40 wells within the study area. However, the depth to groundwater shows considerable variation because of high topographic relief. At Village Hill, the depth to groundwater is 80 to 105 feet near the top of the hill, but quickly decreases

to 25 feet or less around the base of the hill. Elsewhere, the depth to groundwater is consistently less than 20 feet, with nearly half of the wells outside of Village Hill having depths to groundwater of 4–10 feet (Figure 3-1).

The reason the depth to groundwater is considered in the ADEC groundwater use classification is not stated, but there are two possible reasons—well construction costs and health concerns. The depth to groundwater can be used to judge how difficult or expensive it would be to install and operate a well. Simply put, shallow wells are less expensive than deeper wells.

The depth to groundwater also has health implications because groundwater that is too close to the land surface is more susceptible to contamination from anthropogenic sources. Although Alaska does not appear to have any minimum depth requirements for wells, the division of environmental health recommends that all private wells should have casing that extends at least 20 feet bgs to guard against bacteriological and chemical contamination (see http://www.state.ak.us/dec/deh/water/private.htm). This means that well screens must be set at least 20 feet bgs. This practice is consistent with requirements of other states, such as Wisconsin and Utah, where private wells must extend at least 25 to 30 feet bgs or 10 feet below the static water level, whichever is greater. These minimum depths are recommended to protect public health and ensure an adequate supply as the groundwater table fluctuates. The inference that may be drawn from these recommendations and requirements is that water from less than 20 feet bgs should not be used for drinking water.

Much of the study area has a depth to groundwater of less than 20 feet. This fact, coupled with the relatively thin nature of the freshwater layer, suggests that the shallow groundwater in this commercial and industrial area is unsuitable for drinking water. These facts support a non–drinking-water classification for the study area.

The regulations do not directly consider the thickness of the aquifer, but this is an important consideration. Direct thickness measurements of the freshwater have not been made, but they can be estimated from the elevations of the top of the groundwater. Groundwater elevations are highest beneath Village Hill, and the thickest layer of freshwater within the study area is likely to occur beneath Village Hill on the west side of the study area. However, the fresh groundwater under Village Hill has been estimated to average about 13 feet thick, and the maximum estimated yield—assuming that pumping from such a thin layer could be done without saltwater intrusion—would only supply about one tenth the amount currently used by the residents (CESI, 2001b).

Storativity and Transmissivity

ADEC does not state how these two aquifer parameters will be used in their classification evaluation. Nevertheless, these parameters are likely to be highly variable because the aquifer is contained within a broad range of geologic materials ranging from unconsolidated silty fine sands to boulder and cobbles mixed with mud. Groundwater is also found within bedrock units consisting of fractured to massive basalt flows, scoria, and fine-grained ash deposits.

Storativity is a term that is typically associated with confined aquifers, and the groundwater present in the study area is unconfined. The common storage term for unconfined aquifers is called the specific yield, but ADEC's definition of storativity in 18 AAC 75.990(122) is suitable for unconfined aquifers. The specific yield is a measure of the volume of water released from aquifer storage in response to a change in the water-table elevation. The usual range of specific yield is 0.01–0.30, and it is expected that much of the freshwater lens within the study area would have a specific yield of about 0.2 to 0.25 in the fine to medium sand material; within the fractured, vesicular basalt, the specific yield is likely to be more variable and overall lower, with values likely to fall within a range of 0.08–0.15.

Transmissivity is a measure of the amount of water that can be transmitted horizontally through a unit width under a hydraulic gradient equal to 1 (ADEC 18 AAC 75.990[135]). Transmissivity estimates are the product of hydraulic conductivity times the aquifer thickness. The concept assumes that there is an aquitard at the base of the aquifer; however, on St. Paul Island, the base of the aquifer is the interface between seawater and freshwater. Thus, estimates for transmissivity are not realistic in this situation because the estimated values are too large to support sustained pumping without serious mixing of saltwater and freshwater and near permanent damage to the freshwater layer. Nevertheless, it can be stated that the aquifer has moderate hydraulic conductivity that averages about 6×10^{-5} meters/sec (CESI, 2001b). The hydraulic conductivity is typical of silty sands or fractured igneous rocks (Freeze and Cherry, 1979). Although one could calculate the transmissivity, assuming that the bottom of the aquifer was the interface between freshwater and saltwater, this estimate would be meaningless because it is not possible to produce water over the entire thickness of the freshwater lens without upsetting the delicate balance between salt and freshwater. The freshwater layer in the study area is incapable of meeting the production estimates one might calculate from hydraulic conductivities and aquifer thickness estimates.

Although the specific yield of the aquifer is likely to be relatively high given the texture of the aquifer materials, the transmissivity of the aquifer is low because the aquifer is thin. Practical considerations are likely to make the aquifer yield even lower because the full thickness of the aquifer is not available without significant impacts from saltwater intrusion. In comparison, the transmissivity estimates for the aquifer in the city well field range from 100,000 gallons per day per foot (gpd/ft) to over 2,000,000 gpd/ft (USGS, 1980 and ADNR, 1994). The method(s) the government agencies used to estimate transmissivity is not given, but the variation is high, and it is unclear if this is strictly related to the heterogeneity within the aquifer or may be in part related to the calculation method.

Permafrost

Permafrost is not present on St. Paul Island (Kirkwood and Associates, 1987). The mean average air temperature is about 35–36°F, too high to develop or sustain permafrost. The USGS has produced the Permafrost Map of Alaska (USGS, 1965), and it shows the Pribilof Island and all of the Aleutian Islands to be free of permafrost.

Other Relevant Information

The regulation does not define "other relevant information," but this is likely to encompass some of the items listed in the guidance (Table 2-2). The most likely items that would fall in

this "other" category are risk assessment (human health and ecological impacts) and the need to consult with each site landowner, the public, and appropriate government officials before making a decision (see Table 2-2, items 1, 3, and 7). These three items cannot be evaluated until ADEC has first determined whether they will need this information for decision making. This determination is anticipated to occur during ADEC's evaluation of the proposed non-drinking-water classification request. NOAA should anticipate that ADEC would solicit input and consult with other stakeholders before making a decision.

Risk assessments for human and ecological receptors do not appear necessary given the type of contamination and overall patterns, but this is an item that ADEC must evaluate. In any event, a specific risk assessment for the groundwater use classification is not necessary. Rather, if a risk assessment is required by ADEC, NOAA may chose to use or adapt risk assessments from other reports.

The guidance in Table 2-2 also states that surface water and sediment quality standards in 18 AAC 70 must be met if the groundwater is closely connected hydrologically to surface water (Item 5). Because groundwater discharges to Village Cove, ADEC may request samples of harbor water and sediment to demonstrate that surface-water quality standards are being met. The interpretation of these samples may be complicated by the fact that Village Cove has numerous marine vessels, some of which release petroleum substances in various amounts through the normal operations associated with a harbor. This potential problem was recognized long ago when Kirkwood and Associates (1987) stated: "In the long term, water quality degradation could result from operation of the boat harbor with adverse impacts on the biological community" (Volume II, page 26). Mitretek does not believe that samples from Village Cove are necessary.

Finally, ADEC guidance requires that free product needs to be recovered to the maximum extent possible in accordance with 18 AAC 75.325(f)(B) or 18 AAC 78.240(b)(2). Free product was identified in four old (1960s) abandoned wells—two at the DPP and two at the OSP. However, only the east DPP well (EDPP) contained any measurable free product; the west DPP (WDPP) well contained only a sheen or small droplets entrained in the groundwater. Approximately 40 gallons of what appeared to be used motor oil mixed with water was removed from the EDPP well (CESI, 2001a). The east and west wells at the OSP (EOSP and WOSP) also contained petroleum sheen on the water table or small droplets of oil during purging and sampling. The oil in the EDPP well appeared to have been poured into the well and probably represents a small quantity. The volume removed suggests that the oil did not represent a major release. The removal of petroleum from the EDPP well appears to have met the ADEC requirements because follow-up checks on this well have not shown measurable free product on the water table.

Several feet of free product were also discovered in monitor well MW46-19, which was installed by NOAA. The fresh diesel fuel found in MW46-19 appears to be associated with a leaking fuel line at the ATCO dormitory. Preliminary removal tests on the free product show that it is more widespread and persistent than free product found in the EDPP well. Further, the release does not appear to be related to NOAA activities. This release should not become

an issue in NOAA's request for a non–drinking-water use classification. NOAA should continue to help facilitate cleanup of this free product by keeping ADEC informed of the situation and any potential impact the free product may have on the NOAA remedial effort.

> ⇨ *Criterion 2B:*
>
> Actual or potential quality of the groundwater, including organic and inorganic substances, and as affected by background, saltwater intrusion, and known or existing area-wide contamination

Criterion 2B focuses on the overall quality of the groundwater, and the evaluation includes both natural and man-made impacts on the water quality. The evaluation includes an examination of current and potential impacts to groundwater. The criterion can be assessed through examination of maps showing the distributions of water quality parameters, such as electrical conductivity (EC), total dissolved solids (TDS), and chloride (Figures 3-2 to 3-4 respectively). The EC of the groundwater is a good indicator of overall water quality and the EC values have been used to empirically estimate TDS and chloride. EC is also a direct indicator of the degree of saltwater mixing that has occurred either through natural processes or by historic pumping of certain wells to encourage "saltwater" intrusion in Tract 46 during the 1960s. Finally, potential and actual impacts to groundwater can be evaluated through an examination of the contaminant distribution maps for soils and groundwater and a map showing the locations of all potential sources within the study area.

Potential sources of groundwater contamination are largely related to fuel storage and transfer operations. Most releases have been associated with leaking or overfilled tanks, spills, and fuel transfer lines, as discussed earlier and shown in Figures 2-5a and 2-5b. Figures 2-3 to 2-7 outline general areas where soil and groundwater are contaminated by organic and possibly inorganic substances. There is considerable overlap between fuel contamination and apparent contamination by one or more metals.

With the possible exception of low-level detections of PCE in groundwater from monitor well MW46-9, the organic contaminants are the direct result of fuel releases. The inorganic contaminants may result from multiple factors. Petroleum products contain traces of metals, such as arsenic, that may dissolve into the groundwater. However, a study by the state of Vermont (VANR, 1996) and other information (Valkovic, 1978) show that arsenic levels in used oil and petroleum products are quite low (<1.0 milligrams per liter [mg/L]) with fuel oil containing less than 0.10 mg/L, but the arsenic groundwater cleanup level is also relatively low (0.05 mg/L).

It is more likely that arsenic would be released from natural materials as a result of biodegradation of petroleum. Biodegradation of petroleum in groundwater may cause a shift in the groundwater geochemistry from aerobic (oxidizing) to anaerobic (reducing) conditions. This may result in mobilization of naturally occurring metals as iron and manganese oxides within the aquifer materials begin to dissolve. The dissolution of these materials may release arsenic and other metals at concentrations high enough to exceed primary or secondary drinking-water standards. Finally, metals may also be detected at high

concentrations in groundwater samples if the sample is turbid and contains suspended sediment. Groundwater samples for metals must be preserved with nitric acid to a pH <2. The acid will cause the metals in the suspended sediment to dissolve and the resultant concentrations may be above health-based criteria. Filtered groundwater samples or samples collected in a manner that minimizes turbidity and suspended sediment will often have much lower total metal concentrations.

A review of the data in the figures clearly demonstrates the following:

- Groundwater is shallow and susceptible to contamination.
- Groundwater has been impacted by saltwater intrusion.
- There are numerous potential contaminant sources.
- There are large areas of soil contamination.
- There are large areas of groundwater contaminated with fuel components.
- There is a high level of ongoing commercial and industrial activities that makes the shallow groundwater unsuitable for drinking-water purposes.

The water quality within the study area can be viewed independently or in comparison to the existing water quality found in the city supply wells. It is important to first examine the water quality of the city supply so that it can be compared to the general water quality found within the study area and some general measures of water quality. The city water quality is good based on an average chloride content of about 100 mg/L, TDS at 260 mg/L, and EC readings of about 460 µhmos/cm (ADNR, 1994).[1] Thus, the quality of water within the potential ZOC is more than adequate to meet the city's needs. The ADNR study also directly measured and provided scatter diagrams showing correlations between EC, TDS, and chloride concentrations. This information made it possible for ADNR to estimate the TDS and chloride concentrations from the EC data. The ADNR study stated the following on page 6:

> Extrapolation of the data suggests that a conductivity of approximately 1000 micromhos/cm (at 25°C) will result in exceedance of the drinking water standards for chloride and total dissolved solids.

The drinking water standards referred to are the secondary maximum contaminant level (MCL) for TDS and chloride of 500 mg/L and 250 mg/L, respectively. Thus, EC readings above 1,000 microSiemens per centimeter (µS/cm) are very likely to represent areas where the TDS and chloride concentrations are both above secondary MCLs. This relationship was checked against earlier data for the city wells and data from the St. George municipal wells, and the correlation was found to be similar when EC readings were at or above 1,000 µS/cm.

The water quality in the city wells contrasts sharply with the description and chemical composition for groundwater beneath the study area. Most of the groundwater in the study

[1] Note that 1 microhmos per centimeter (µmhos/cm) is equal to 1 microSiemens/cm (µS/cm) and that µS/cm have been the recommended units for EC since about 1980.

area contains EC readings greater than 1,000 µS/cm (Figure 3-2), and the vast majority of the groundwater within the study area is estimated to contain TDS and chloride concentrations above secondary MCLs (Figures 3-3 and 3-4 respectively). Further, brackish water is commonly defined as having TDS concentrations between 1,000 and 3,000 mg/L, and these concentrations are approximately equivalent to EC readings between 2,000 and 6,000 µS/cm. A large part of the groundwater in the Tract 46 study area is within the brackish range; at a few locations, the EC readings are high enough that the water exceeds the upper end of the brackish range (EC >6,000 µS/cm or TDS >3,000 mg/L) and begins to approach the composition of seawater (Figures 3-2 and 3-3). For example, wells near the center of the study area in the vicinity of the DPP have penetrated about 15–20 feet into groundwater, but the water is either brackish or highly saline. The EDPP well has a salinity of 15 parts per thousand (ppt) equivalent to an EC reading of about 25,000 µS/cm, while the two wells at the OSP have salinities of about 4.5 ppt. As a comparison, the salinity of seawater is about 35 ppt. Clearly, the natural groundwater quality and the susceptibility of the groundwater to contamination in the central portion of the Tract 46 study area make it unacceptable for a drinking-water supply irrespective of the presence of petroleum contaminants.

Within the study area, the best water quality and thickest freshwater layer occur under Village Hill and along the eastern side of the study area. However, the limited area coupled with the thin nature of the freshwater layer makes the available yield too restricted to satisfy more than a small portion of the city's water demand. Further, in the eastern part of the study area, the proximity to potential sources and the shallow nature of the groundwater makes this area a poor choice for a drinking water supply.

⇨ *Criterion 2C:*

The existence and enforceability of institutional controls described in 18 AAC 75.375 or municipal ordinances or comprehensive plans that prohibit or limit access to the groundwater for use as drinking water

There are no institutional controls, ordinances, or comprehensive plans that prohibit or limit access to groundwater within the study area. However, in a meeting with the city manager in July 2001 he indicated that there are no wells in this area, and he could not imagine why anyone would want to install a well in the downtown area. He indicated that the city would not allow wells to be installed within the commercial area because of the poor groundwater quality and the presence of saltwater. NOAA may wish to ensure that groundwater will not be used within the study area by working with the city to develop institutional controls and by including deed restrictions on the land before it is conveyed to other groups.

⇨ *Criterion 2D:*

Land use of the site and neighboring property, using the factors in EPA's *Land Use in the CERCLA Remedy Selection Process*, adopted by reference in 18 AAC 75.340

This EPA headquarters directive stresses that for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or Superfund, future land use decisions should

be more realistic so that cleanup criteria are not so stringent that they become technically impractical. The memo states that, "remedial action objectives developed during the RFI/FS [Resource Conservation and Recovery Act (RCRA) Facility Investigation/Feasibility Study] should reflect the reasonably anticipated future land use." It lists 19 sources and types of information that might help in determining the "reasonably anticipated future land use." This means that, where appropriate, scenarios other than residential should be considered for Superfund. The memo also implies that RCRA should do the same. However, EPA is aware that RCRA sites are often industrial sites that will remain industrial. This makes the issue of future land use less problematic. The directive states that EPA intends to address the issue of future land use as it relates specifically to RCRA facility cleanups in subsequent guidance or rule makings; no additional information was found specifically on this issue, which may explain why ADEC is relying on the CERCLA directive.

The directive includes the following considerations:

- Developing assumptions about future land use based on input from the local community
- Community involvement in deciding what the future land use might be for the site
- Future land-use assumptions to help focus the baseline risk assessment and feasibility study on cost-effective remedies
- Remedial action objectives reflecting reasonably anticipated future land use
- Institutional controls to prevent unanticipated changes in land use if the remedy includes some type of restricted use in order to be protective
- Five-year reviews of the institutional controls at sites where on-site levels of contaminants require limited use and restricted exposure

Land ownership is a complex issue because of the land entitlement procedures under the Alaska Native Claims Settlement Act (ANCSA) of 1971. The land within the study area has a complex history and multiple landowners. A resurvey of the industrial area in 1997 resulted in the renumbering of Tract 41 as Tracts 45 and 46 (CESI, 1998, CESI, 2000). Tract 45 is relatively small (0.11 acre), while Tract 46 is listed as 9.82 acres. Tract 43 is the site of the former AST farm on Village Hill (Figure 1-1), while Tract A is the St. Paul town site. There are many parcels of land within the various tracts, and nine of the parcels are denoted as having an application for a Section 3(e) determination under ANSCA.

Land use within the approximate 45-acre study is largely commercial/industrial. The largest residential area is about 7 acres and is centered on Village Hill. However, the areas with soil and groundwater contamination are largely restricted to the commercial and industrial portions of the study area and the area extending downgradient towards the harbor.

The city adopted a Comprehensive Plan for St. Paul Island in 1984, and most of the study area was classified as industrial/harbor under the 1984 plan. This land-use classification remained largely the same in the more recent Ataqan Akun Community Plan (city of St. Paul, Alaska, March 1995). The land-use patterns have been relatively stabile over the years, and this pattern is not expected to change in the foreseeable future. The resident population is

expected to remain relatively stabile over the next decade. There is no reason to expect that the current land use will be markedly different in the future.

> ⇨ *Criterion 2E:*
>
> The need for a drinking-water source and the availability of an alternative source

There is no current need for a drinking-water source, and as previously discussed, the groundwater within the study area has insufficient thickness and natural quality to support the city needs even on a part-time basis. The city has an existing well field that is about two miles northeast of the study area. The groundwater within and upgradient of the well field is not hydrologically connected to the study area. The area containing the city water supply has been evaluated several times in the last 30 years, and new areas for possible expansion have been identified within the same watershed as the current public supply wells. Thus, there is no current need—or any reason to expect that there will be a future need—for the groundwater within the study area to be used as a potential drinking-water source.

The existing water supply and the potential ZOC are adequate to meet all anticipated future needs, except a possible large expansion in fish-processing capacity. If additional drinking water is needed for fish processing, it is very likely that any new wells would be installed within the well field watershed area shown in Figure 2-1. An alternative source of water is not needed because the contamination does not impact the drinking-water wells or the source area for the drinking-water supply.

> ⇨ *Criterion 2F*:
>
> Whether the groundwater is exempt under 40 CFR 146.4, revised as of July 1, 1997, and adopted by reference

This criterion was taken from the EPA underground injection control program. Groundwater that is an "exempt aquifer," means that it is not suitable for a public drinking-water supply. The complete text of 40 CFR 146.4 follows:

> An aquifer or a portion thereof which meets the criteria for an "underground source of drinking water" in § 146.3 may be determined under 40 CFR 144.8 to be an "exempt aquifer" if it meets the following criteria:
>
> (a) It does not currently serve as a source of drinking water, and
>
> (b) It cannot now and will not serve as a source of drinking water because:
>
> 1. It is mineral, hydrocarbon or geothermal energy producing, or can be demonstrated by a permit application for a Class II or III operation to contain minerals or hydrocarbons that considering their quantity and location are expected to be commercially producible.
> 2. It is situated at a depth or location which makes recovery of water for drinking purposes economically or technologically impractical;

3. It is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption; or
4. It is located over a Class III well mining area subject to subsidence or catastrophic collapse; or
5. The total dissolved solids content of the groundwater is more than 3,000 mg/L and less than 10,000 mg/L and it is not reasonably expected to supply a public water system.

The above section refers to "an underground source of drinking water," and that phrase is defined in 40 CFR § 146.3 as follows:

An aquifer or its portion:

(1) (i) Which supplies any public water system; or

(ii) Which contains a sufficient quantity of ground water to supply a public water system; and

(A) Currently supplies drinking water for human consumption; or

(B) Contains fewer than 10,000 mg/L total dissolved solids; and

(2) Which is not an exempted aquifer.

Small portions of the groundwater in the study area can be classified as an exempt aquifer—an aquifer not suitable for a public water supply. The groundwater meets the requirements of an exempt aquifer under items (a) and (b)(5) as shown in Figure 3-3. Portions of the aquifer may also qualify as an exempt aquifer under (b)(3), but the economics and technology have not been considered in sufficient detail to make this determination. The groundwater in the study area is not being used and EC readings suggest that TDS is >3,000 mg/L in several areas. Figure 3-5 identifies at least four locations where groundwater is likely meet the exempt aquifer criterion for TDS.

3.3 Factor 3–Transport of Contaminants into Areas Beyond the Site

Factor Summary: This factor was assessed by evaluating criteria 3(A) to 3(I) in Table 2-1. The study area meets all the requirements of this factor.

Factor 3 states that "groundwater affected by the hazardous substance will not be transported to groundwater that is a source of drinking water, or that is a reasonably expected potential future source of drinking water, in concentrations in the receiving groundwater that exceed the groundwater cleanup levels." Table 2-1 presents Factor 3 and the nine criteria (3A to 3I) used in the evaluation.

ADEC will use Factor 3 to help determine whether groundwater containing hazardous substances can be transported into groundwater that is a current or future source of drinking water. The information that would be used in assessing the nine criteria has generally been presented in earlier discussions. The nine criteria and the specific information that addresses them are presented below or, if previously discussed, the earlier discussion is referenced.

⇨ *Criterion 3A*:

The areal extent of the affected groundwater

The areal extent of the affected groundwater was discussed in Section 2.2 and under Criterion 2B. The general outlines of the major groundwater contaminant plumes are shown in Figures 2-4a, 2-4b, and 2-7.

⇨ *Criterion 3B*:

The distance to any existing or reasonably anticipated future water supply well

The information addressing this criterion was presented in Section 2.2 and under Criteria 1A and 1B. The distance to the existing and reasonably anticipated future water supply wells is at least 2 miles (Figure 2-1).

⇨ *Criterion 3C*:

The likelihood of an aquifer connection due to well construction practices in the area where the site is located

This criterion is designed for areas with multiple overlying aquifers or significant vertical distances between the contaminated soil and groundwater. These potential site conditions are not present in the study area, so this criterion is not applicable. There is only a single, shallow aquifer in the study area. The distance to groundwater is generally less than 20 feet, and infiltration is relatively rapid given the overall porous nature of the soils and bedrock. Contaminants can easily reach groundwater, and well-construction practices are not a factor in contaminant migration to the shallow groundwater.

⇨ *Criterion 3D*:

The physical and chemical characteristics of the hazardous substance

The substances comprising the bulk of the contamination are petroleum hydrocarbons related to releases of diesel oil, fuel oil, or heating oil (e.g., # 2 fuel oil) and used motor oil. DRO is the primary contaminant of concern, and this fuel product is semi-volatile, relatively mobile, and moderately soluble and persistent. Diesel fuel is primarily composed of aromatic hydrocarbons (35 percent) and aliphatic hydrocarbons (64 percent), with about 1 percent olefinic hydrocarbons. DRO is the class or group of compounds measured by Alaska Method AK102 and is defined as n-alkanes between C_{10} and C_{25}. DRO tends to be more persistent than the lower-weight components of petroleum.

Small amounts of GRO may also be present, and there are occasional reports of arsenic, lead, and chromium above background levels in soil or groundwater. The petroleum compounds are largely present in groundwater in the dissolved phase, and they readily move with the groundwater. The metals in groundwater tend to form a more restricted pattern than the petroleum compounds, and the metals are generally less mobile.

It is likely that dissolved Cr, in particular, is a result of adding nitric acid as a preservative to groundwater samples during the preservation of the unfiltered samples. Nonetheless, speciation of Cr revealed that it is predominantly in the less toxic Cr^{+3} form; if the ADEC Cr^{+3} groundwater cleanup standard (36,500 µg/L) is used, the concentrations are well within the acceptable limits. The lead in groundwater may be associated with the former gasoline tank farm, although wells at that site did not reveal lead contamination in the groundwater. Careful sampling should help determine the true groundwater concentrations of the metals.

ADEC is likely to have sufficient experience with these common contaminants, making it unnecessary to reproduce detailed chemical and physical data for these substances. This information can be supplied on short notice if required.

⇨ *Criterion 3E*:

The hydrogeological characteristics of the site

Sections 2.2 and 3.2 (Factor 2A) presented the hydrogeological characteristics of the site.

⇨ *Criterion 3F*:

The presence of discontinuities in the affected geologic stratum at the site

There are various geologic discontinuities at the site. These include structural discontinuities, such as the potential for large-scale faulting or fractures. A fault or fault zone may be present on the northeast side of Village Hill near the center of the site. The fault may be an area of higher hydraulic conductivity. Groundwater in this area is influenced more than any other portion of the study area by the three-foot tidal range. This may help explain, in part, the high salinity found in the area of the OPP and OSP.

Depositional discontinuities include rapid and abrupt lithologic changes related to volcanism and sedimentation. Although these geologic features add complexity to the groundwater system, they do not play a role in groundwater classification for this site. The groundwater within the study area is distinctly separate from the groundwater supplying the city wells. Discontinuities are important where they can provide a pathway or a barrier between the affected area and current or future water supply wells or groundwater basins. Because the study area is an entirely separate groundwater basin, discontinuities within the study area are relatively unimportant in deciding a groundwater class.

⇨ *Criterion 3G*:

The local climate

The local climate is typical subarctic marine as discussed in Section 2.2 and under Criterion 2A. The average annual temperature is about 36°F, precipitation averages about 24 inches per year, and permafrost is not present.

⇨ *Criterion 3H*:

The degree of confidence in any predictive modeling performed

Predictive modeling was not performed. There is no need for groundwater modeling with regards to groundwater classification at this site.

⇨ *Criterion 3I*:

Other relevant information; the department will request additional information if the department determines that the information is necessary to protect human health, safety, or welfare, or the environment.

ADEC will request additional information if needed.

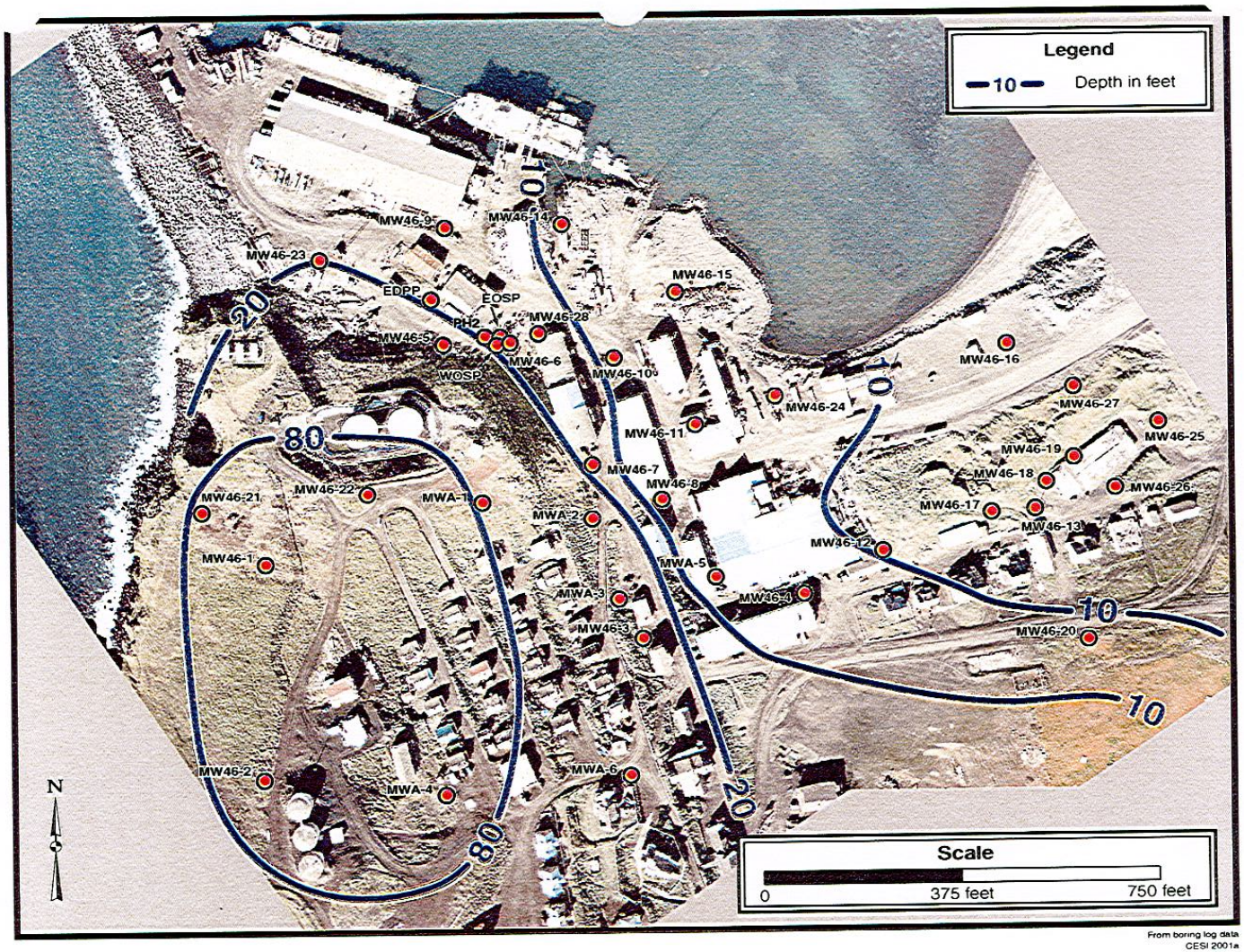
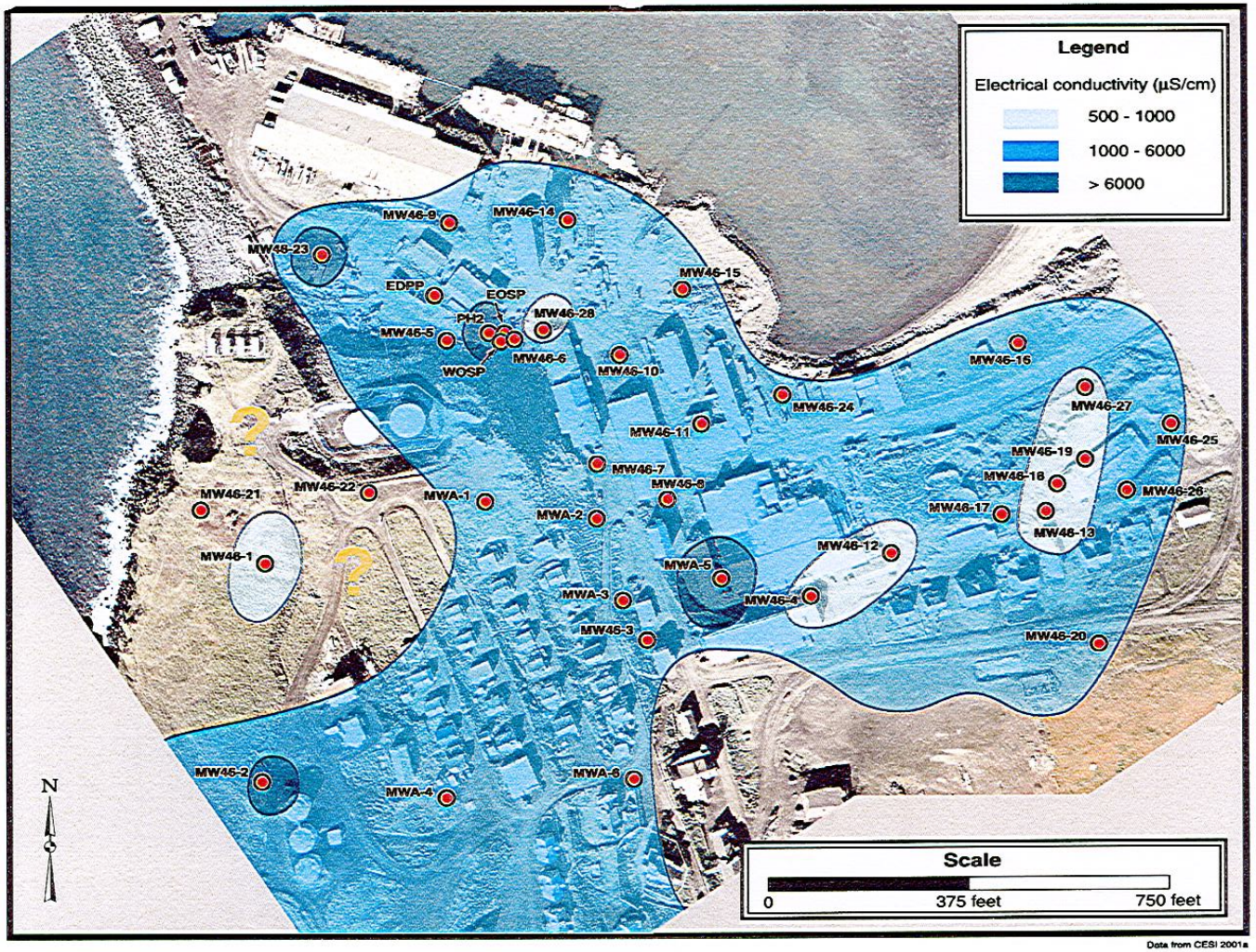


Figure 3-1. Depth to Groundwater within the Study Area



Data from CESI 2001a

Figure 3-2. Electrical Conductivity (EC) in Groundwater
July/September 2000

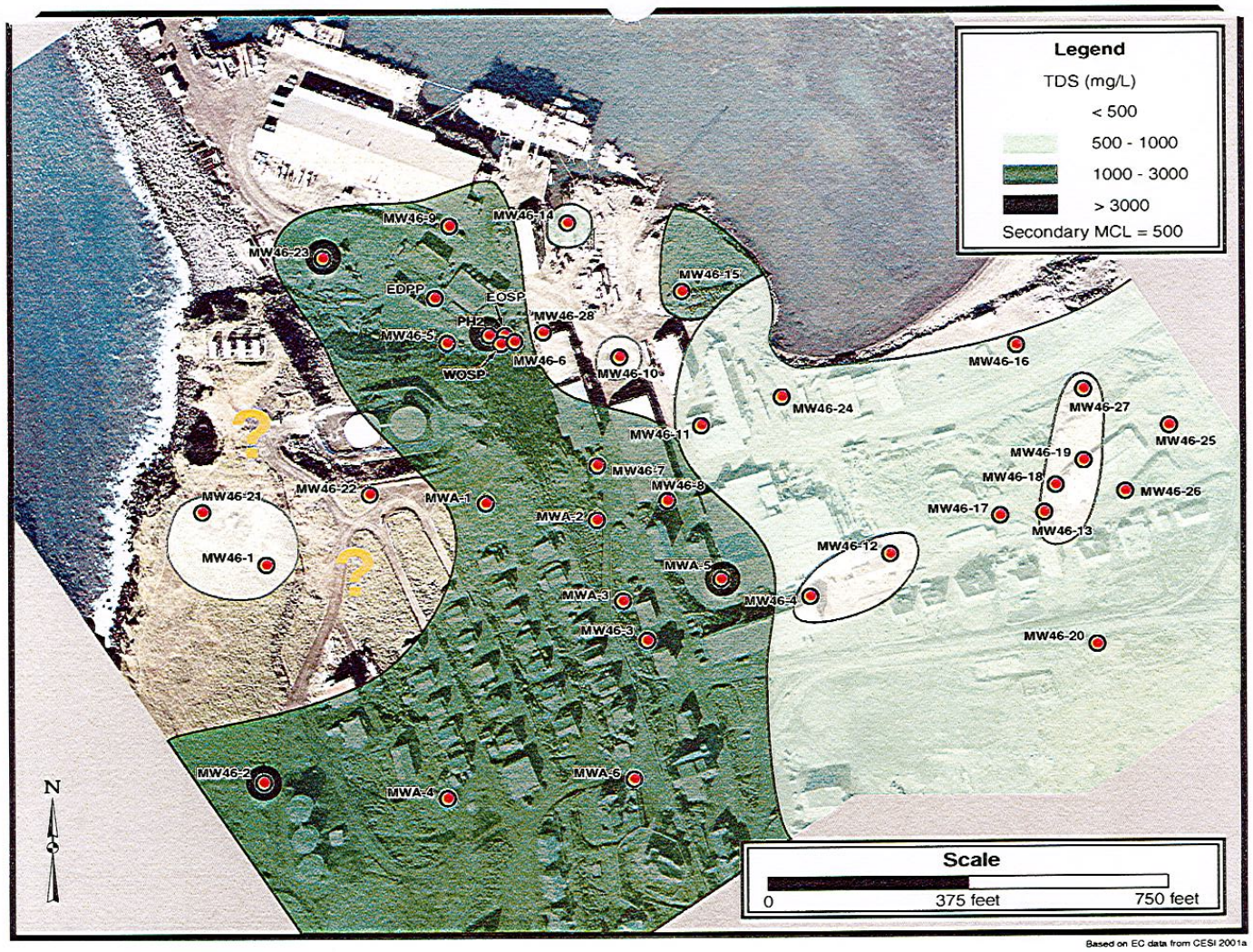


Figure 3-3. Estimated Total Dissolved Solids (TDS) Concentrations in Groundwater
July/September 2000

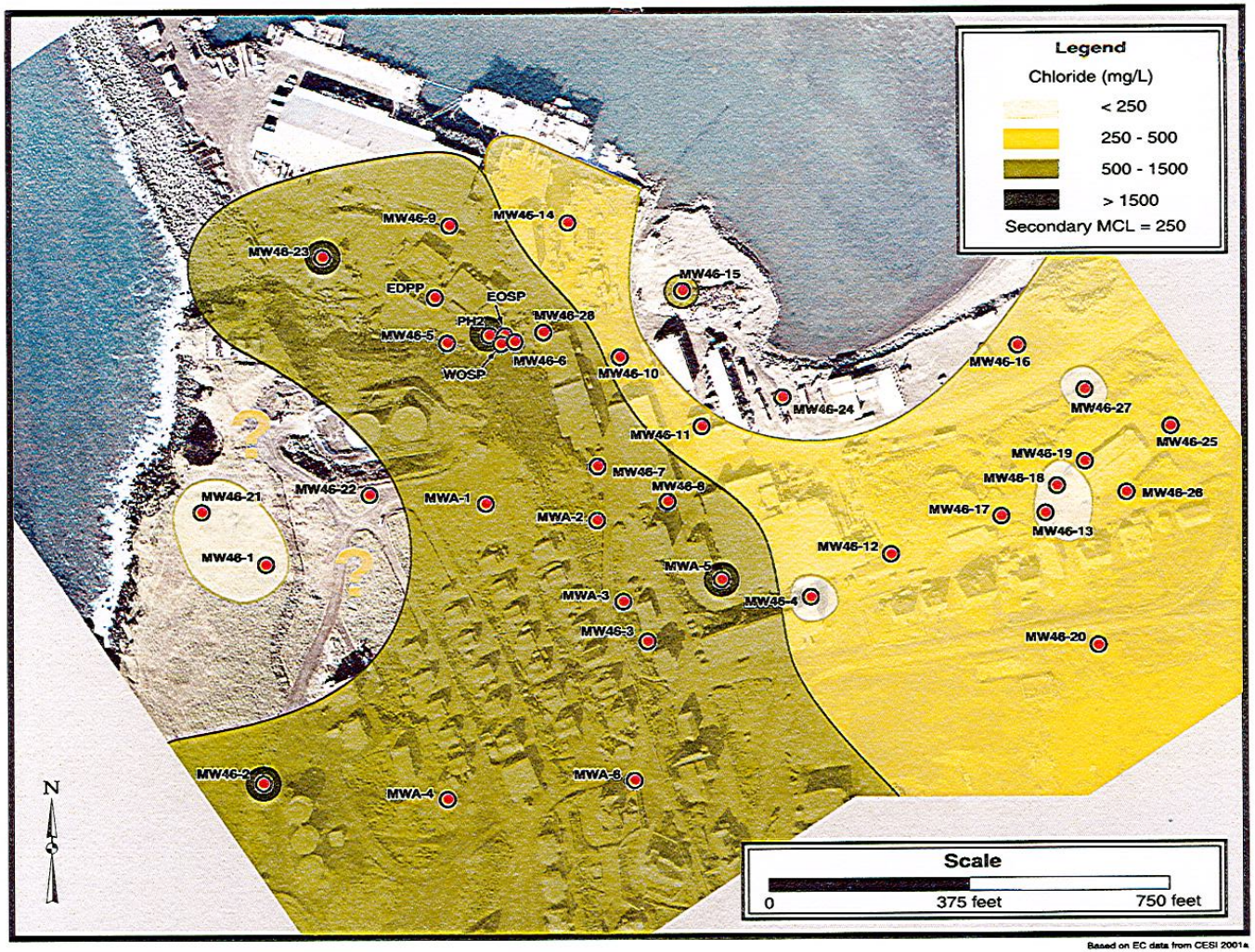


Figure 3-4. Estimated Chloride Concentrations in Groundwater
July/September 2000

Figure 3-5. Locations Where Groundwater Meets the Criteria for an Exempt Aquifer

Section 4

Conclusions and Recommendations

The shallow groundwater beneath the study area meets all the technical requirements for assignment of a non–drinking-water classification. The shallow groundwater has poor natural water quality with elevated EC, TDS, and chloride. Nearly all the study area is underlain by groundwater whose natural water quality exceeds the secondary MCLs for TDS and chloride. Groundwater on the eastern side of the study area has the best overall quality, but it is locally impacted by floating fuel associated with the ATCO dormitory. Because the groundwater is relatively close to the land surface and thin, it is susceptible to contamination and the potential freshwater yield is low. The soil type and shallow depth to groundwater provide little capacity to dilute any contaminants.

The exposure path to humans is limited unless wells or excavations expose the contaminated groundwater. Adoption of the 10X Rule does not change or alter cleanup levels for the soil ingestion and inhalation exposure pathways. Thus, the protection afforded by the ADEC regulations will be the same for exposure to petroleum-contaminated soil.

The ecological risk is likely to be low given the size of Village Cove and the likely low flux of groundwater into the harbor. Nevertheless, this determination is one that not only must be demonstrated, but must also be approved by ADEC. Part of this approval process is likely to include public meetings to obtain input from other stakeholders.

NOAA should pursue a non–drinking-water classification for the study area because it is a reasonable and an appropriate approach for establishing cleanup levels in an industrial and commercial area with no current or likely future potential for drinking-water use. As an additional safeguard to public health, NOAA should consider discussing land-use restrictions with the city of St. Paul and attaching deed restrictions on any land transfers. These restrictions should prohibit using groundwater to minimize exposure to contaminated groundwater. Consideration should also be given to prohibit removal of potentially contaminated soil from any site within the study area without written notification and approval of NOAA.

List of References

AAC. 1999. Alaska Administrative Code, Title 18, Chapter 75.

ADEC. 2001. Guidance No. CS/STP 01-01 *Use of 10X Rule and Risk Assessments to Develop Groundwater Cleanup Levels.* 27 April 2001 (www.state.ak.us/local/akpages/env.conserv/dspar/csites/guidance/10xrule.pdf)

ADEC, 2001. *Conducting Cleanups Under Methods Two and Three.* May 2001 (http://www.state.ak.us/dec/dspar/csites/guidance/ind_trainmethod23.htm).

ADEC, 2000. *Risk Assessment Procedures Manual.* 8 June 2000. (http://www.state.ak.us/dec/dspar/csites/ind_docs.htm)

ADNR, 1994. *Analysis of an Aquifer Test at St. Paul Island, Pribilof Islands, Alaska*, Public-Data File 94-27, Alaska Department of Natural Resources, J. A. Munter and R. D. Allely.

Boyle and Jonasson. 1973. *The Geochemistry of Arsenic and Its Use as an Indicator Element in Geochemical Prospecting*, Journal of Geochemical Exploration, Vol. 2, pages 251-296.

CESI, January 1997. *Expanded Site Investigation, St. Paul Island, Pribilof Islands, Alaska Volume I* prepared for the U.S. Army Corps of Engineers by Hart Crowser.

CESI, January 1998. *Preliminary Assessment (PA) for St. Paul Former Fish Processing Plant and Gas Station Additional UST, St. Paul, Island, Alaska* Columbia Environmental Sciences, Inc.

CESI, March 1999. *St. Paul Groundwater and Potential Source Investigation, St. Paul Alaska* Site Investigation Report, Columbia Environmental Sciences, Inc.

CESI, January 2000. *Site Characterization Plan for Tract 46 and Adjoining Properties, St. Paul Island, AK.* Version 2.0. Columbia Environmental Sciences, Inc.

CESI, May 2001a. *Draft Site Characterization Report, Tract 46 and Vicinity (TPA Site 9) Saint Paul Island, Alaska,* Version 1.6, Columbia Environmental Sciences, Inc.

CESI, October to December 2001b. *Draft Site Characterization Report, Tract 46 and Vicinity (TPA Site 9) Saint Paul Island, Alaska,* Versions 1.7 to 2.0, Columbia Environmental Sciences, Inc.

Freeze and Cherry. 1979. *Groundwater*, Prentice-Hall Inc., R. Allen Freeze and John A. Cherry.

IT, March 2002a. *Groundwater Monitoring Report, February 2001 Quarterly Event St. Paul Island, Alaska*, IT Alaska, Inc.

IT, March 2002b. *Groundwater Monitoring Report, May 2001 Quarterly Event St. Paul Island, Alaska*, IT Alaska, Inc.

IT, March 2002c. *Groundwater Monitoring Report, September 2001 Quarterly Event St. Paul Island, Alaska*, IT Alaska, Inc.

IT, March 2002d. *Draft, Annual Groundwater Monitoring Report–2001 St. Paul Island, Alaska*, IT Alaska, Inc.

Kirkwood and Associates, 1987. *Saint Paul Conceptually Approved Coastal Management Plan, Resource Inventory and Analysis, Volumes I and II*, September 1987.

USGS. 1976. *Water-Resources Reconnaissance of St. George Island, Pribilof Islands, Alaska*, Water Resources Investigations 6-76, United States Geological Survey, Gary S. Anderson, January 1976.

USGS, 1965. *Permafrost Map of Alaska, Map I-445*, United States Geological Survey, O. J. Ferrians, Jr.

USGS. 1980. *Water-Resources Reconnaissance of the Southeastern Part of St. Paul Island, Pribilof Islands, Alaska*, Water Resources Investigations 80-61, United States Geological Survey, Alvin J. Feulner.

USGS. 1993a. *Saint Paul Island East Quadrangle, Alaska, 1:25,000 Series*. Produced in cooperation with U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

USGS. 1993b. *Saint Paul Island West Quadrangle, Alaska, 1:25,000 Series*. Produced in cooperation with U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

Valkovic. 1978. *Trace Elements in Petroleum*, Petroleum Publishing Company, Vlado Valkovic.

VANR. 1996. *Vermont Used Oil Analysis and Waste Oil Furnace Emissions Study*. Prepared by the Vermont Agency of Natural Resources, Department of Environmental Conservation. March 1996.

Woodward-Clyde, 1994. Site Inspection Report, St. Paul Island, Alaska. Prepared for the Seattle District US Army Corps of Engineers, November 1994.

Appendix

Additional Information

A.1 Relevant Guidance Documents

ADEC Guidance Document, No. CS/STP 01-01, *Use of 10X Rule and Risk Assessments to Develop Groundwater Cleanup Levels* 27 April 2001

ADEC training slides dated May 2001

A.2 Compounds Exceeding Table C Levels

Table A-1 presents the compounds in groundwater that are covered by the 10X Rule because they exceed Table C levels.

Table A-1. Compounds in Groundwater that Exceed Table C Levels

Organic Compounds	Inorganic
Benzene	Chromium
Gasoline Range Organics (GRO)	Lead
Diesel Range Organics (DRO)	
Residual Range Organics (RRO)	
Toluene	
Tetrachloroethene (PCE)	

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITE REMEDIATION AND STORAGE TANK PROGRAMS

Guidance No. CS/STP 01- 01 April 27, 2001

USE OF 10X RULE AND RISK ASSESSMENTS TO DEVELOP GROUNDWATER CLEANUP LEVELS

PURPOSE:

This policy describes the application of 18 AAC 75, Article 3 and 18 AAC 78, Article 6 for approving a groundwater cleanup level developed using the 10X Rule or a department-approved risk assessment.

BACKGROUND:

Three options are provided in 18 AAC 75. 345 (b) for establishing a groundwater cleanup level.

1. Contaminated groundwater must meet the Table C cleanup levels if the current or reasonable expected future use of groundwater, as determined under 18 AAC 75.350, is a drinking water source.

2. The department may establish a groundwater cleanup level equal to 10 times the Table C cleanup level (10X Rule) if the department determines in consultation with specified parties that the groundwater, as determined under 18 AAC 75.350, is not a current or reasonably expected future drinking water source. The Table C cleanup levels must be met at the property boundary in an area where the current or reasonably expected potential future use of groundwater in the neighboring property is a drinking water source, unless an alternate point of compliance is approved.

3. Under 18 AAC 75.345(b)(3), the department may approve groundwater cleanup levels based on an approved risk assessment conducted in accordance with the department's *Risk Assessment Procedures Manual*, dated June 8, 2000, incorporated by reference into regulation. If a risk assessment indicates that exposure to contamination results in unacceptable risk to human health or the environment, alternative cleanup levels may be proposed that reduce the risk to acceptable risk management levels established under 18 AAC 75.325(h) or 18 AAC 78.600(e). Risk management involves an evaluation of the results of a risk assessment in conjunction with overlying regulatory requirements in making cleanup decisions at a contaminated site.

The groundwater and surface water cleanup regulations also identify cases that provide for more stringent cleanup levels than those listed above in site specific cases.

This guidance document describes the decision process that applies to the development of groundwater cleanup levels based on the implementation of the 10X Rule or site-specific risk assessments. The document also identifies applicable criteria for the cleanup of a contaminated

site where a groundwater cleanup level is developed based on the 10X Rule or a site-specific risk assessment.

APPLICABILITY/ACTION:

The attached guidance applies to all Division of Spill Prevention and Response (SPAR) staff involved in approving groundwater clean up levels using the 10X Rule or a department-approved risk assessment. The regulations at 18 AAC 75, Article 3 or 18 AAC 78 govern where a conflict arises between this guidance document and the regulations.

GUIDANCE:

Regulations under 18 AAC 75, Article 3, and referenced in 18 AAC 78.620, provide the requirements for cleaning up groundwater contaminated by hazardous substances. Cleanup levels are based on actual and potential groundwater use. If groundwater is a current or reasonably expected future source of drinking water, then Table C cleanup levels apply throughout the contaminant plume. For contaminants not listed in Table C, the appropriate groundwater cleanup level for potable groundwater is a federal Maximum Contaminant Level (MCL). If one does not exist, then the appropriate cleanup level is a calculated level protective of drinking water use of the groundwater under a residential land use scenario using department approved toxicity data and Equations 1 and 2 of the department's *Guidance on Cleanup Standards Levels and Input Parameters* dated July 28, 1999, incorporated by reference into regulation. For the purposes of this document, Table C cleanup levels, federal MCLs, and approved risk-based cleanup levels protective for use of the groundwater as a drinking water source under a residential land use scenario are collectively termed in this document ***"applicable cleanup levels."*** If the department determines in consultation with each site landowner, the public, and appropriate government officials, that the groundwater is not a current or a reasonably expected potential future source of drinking water based on an evaluation of the factors in 18 AAC 75.350, then 10 times the applicable groundwater cleanup level applies throughout the contaminant plume.

A site specific risk assessment may also be used as the basis for developing site-specific groundwater cleanup levels. The risk assessment provides the basis for determining whether impacted media at a site require cleanup to protect human health and the environment under specific land use and site conditions.

In all cases, the department will consult with each landowner, the public and applicable government officials in making a determination whether the groundwater is considered not a current or future drinking water source.

Use of 10X Rule for Approved Site-Specific Cleanup Levels

If a site-specific analysis under 18 AAC 75.350 indicates there is no exposure to groundwater because groundwater is determined by the department to not be a current or potential drinking water source, then the applicable groundwater cleanup level is 10 times the cleanup levels in Table C, for each contaminant, as required under 18 AAC 75.345(b)(2). However, project managers must consider whether a risk assessment is necessary to evaluate other exposure pathways, such as volatilization of contaminants into structures, and impacts to ecological receptors. If the 10X Rule is not protective of other exposure pathways than determining a cleanup level using a risk assessment is appropriate.

If site-specific cleanup levels based upon the 10X Rule are developed for groundwater that is not a current or potential drinking water source, then approval of the 10X Table C cleanup levels will require the following:

- free product will be recovered in accordance with 18 AAC 75.325(f)(B) or 18 AAC 78.240(b)(2);
- where groundwater is closely hydrologically connected to surface water, water quality standards in 18 AAC 70 will be met for surface water and sediment;
- each proposed site-specific cleanup level does not exceed 10 times the cleanup levels in Table C on the property. Table C cleanup levels apply off the property unless the department has also approved 10X Table C levels for those properties;
- the site risk will not exceed the department's cumulative risk management levels for human health or ecological receptors;
- applicable institutional controls as required by 18 AAC 75.375 (a) will be implemented.

Upon approval of the site-specific 10 X Rule cleanup levels, a plan for conducting a cleanup of the groundwater shall be submitted to the department for approval as required by 18 AAC 75.360, when groundwater cleanup levels are exceeded.

For groundwater where 10 times the residential groundwater cleanup level is the applicable cleanup level, a No Further Remedial Action Planned (NFRAP) letter will be issued for the groundwater contamination at the site, indicating that active remediation is no longer required, when the following requirements under 18 AAC 75.380(c)(2) or 18 AAC 78.276(e)(2) have been met:

- the maximum concentration of each groundwater contaminant, as confirmed by periodic sampling, is at or below 10 times the cleanup level in Table C;
- the size of the contaminant plume is steady-state or shrinking;
- a trend of reducing contaminant concentrations has been established;
- water quality standards have been met in contaminated surface water and sediment where contaminated groundwater is closely hydrologically connected to surface water; and
- Institutional controls for the groundwater if required by 18 AAC 75.375 (a) have been established.

The department will issue a Site Closure letter for groundwater contamination at the site when:

- contaminated groundwater has reached 10 times the cleanup levels in Table C, as confirmed by periodic sampling; and
- soil has reached levels considered protective of residential use of the site; and
- long term monitoring and institutional controls are no longer required.

Use of Risk Assessment for Approved Site-Specific Cleanup Levels

If a risk assessment is conducted to demonstrate that cleanup of groundwater is not necessary based on proposed risk-based cleanup levels, approval of the risk-based cleanup levels will require the following:

- free product will be recovered in accordance with 18 AAC 75.325(f)(B) or 18 AAC 78.240(b)(2);
- there will be no adverse impacts to human health or to the environment from potential

exposure to groundwater contamination;

- the site risk will not exceed the department's cumulative risk management levels for human health or ecological receptors.
- where groundwater is closely hydrologically connected to surface water, water quality standards in 18 AAC 70 will be met for surface water and sediment;
- potential plume migration has been evaluated in the site characterization and risk assessment; and
- applicable institutional controls as required by 18 AAC 75.375(a) will be implemented.

For sites where the department has approved site-specific risk-based groundwater cleanup levels for groundwater which is not a current or potential drinking water source, a NFRAP letter will be issued for the groundwater contamination at a site indicating that active remediation of the groundwater is no longer required when the following requirements under 18 AAC 75.380(c)(2) or 18 AAC 78.276(e)(2) have been met:

- the maximum concentration of each groundwater contaminant, based on sufficient periodic sampling is at or below the site-specific risk-based cleanup level(s);
- the size of the contaminant plume is steady-state or shrinking;
- a trend of reducing contaminant concentrations has been established;
- water quality standards have been met in contaminated surface water and sediment where contaminated groundwater is closely hydrologically connected to surface water; and
- institutional controls for the groundwater as required by 18 AAC 75.375 (a) have been established.

The department will issue a Site Closure letter for groundwater contamination at the site when:

- contaminated groundwater has reached applicable groundwater cleanup levels as confirmed by periodic sampling;
- soil has reached levels considered protective of residential use of the site; and
- long term monitoring and institutional controls are no longer required.

Terms used in this document, unless defined otherwise, have the meaning given in 18 AAC 75.990.

APPROVAL:

_____ _____

James F. Hayden Date
Acting Program Manager

Gw risk guid final 4_27_01

Method Two

10 Times Rule

- Only applies to **contaminated** groundwater
  - can not apply 10X Rule if groundwater is not affected
- 18 AAC 75.345(b)(2) - 10 times Table C applies where groundwater is not a current or future source of drinking water
  - "350 Determination"
- If GW is not a suitable source of drinking water, then:
  - the applicable GW cleanup level is 10x Table C
  - the soil cleanup level for migration to GW is 10x Table B1/B2 (Method 2)

350 Determination

- 18 AAC 75.350 - Groundwater is considered to be a drinking water source unless is it determined that...
  - (1) Current Use
    - is not used for private or public DWS
    - is not within the zone of contribution
    - is not within a recharge area
  - (2) Future Use
    - Availability - depth to GW, storativity and transmissivity of aquifer, permafrost
    - Quality - organics/inorganics, saltwater intrusion, background or areawide contamination
    - ICs - 18 AAC 75.375, municipal ordinances, comprehensive plans
    - Land Use - of site and neighboring property
    - Need - availability of alternatives
  - (3) Transport
    - will not be transported to GW who's current or future use is as a DW source at concentrations that exceed GW or SW cleanup levels

Case Study - 350 Determination

- Large industrial facility, near shore in Southeast Alaska
- Arsenic, lead, manganese, PAHs, dioxins, PCBs, and petroleum hydrocarbons were identified as COPCs in soil at one or more areas
- Groundwater was also affected
- Early removal actions were implemented to minimize the possibility of offsite migration of contaminants to cove through surface water or groundwater

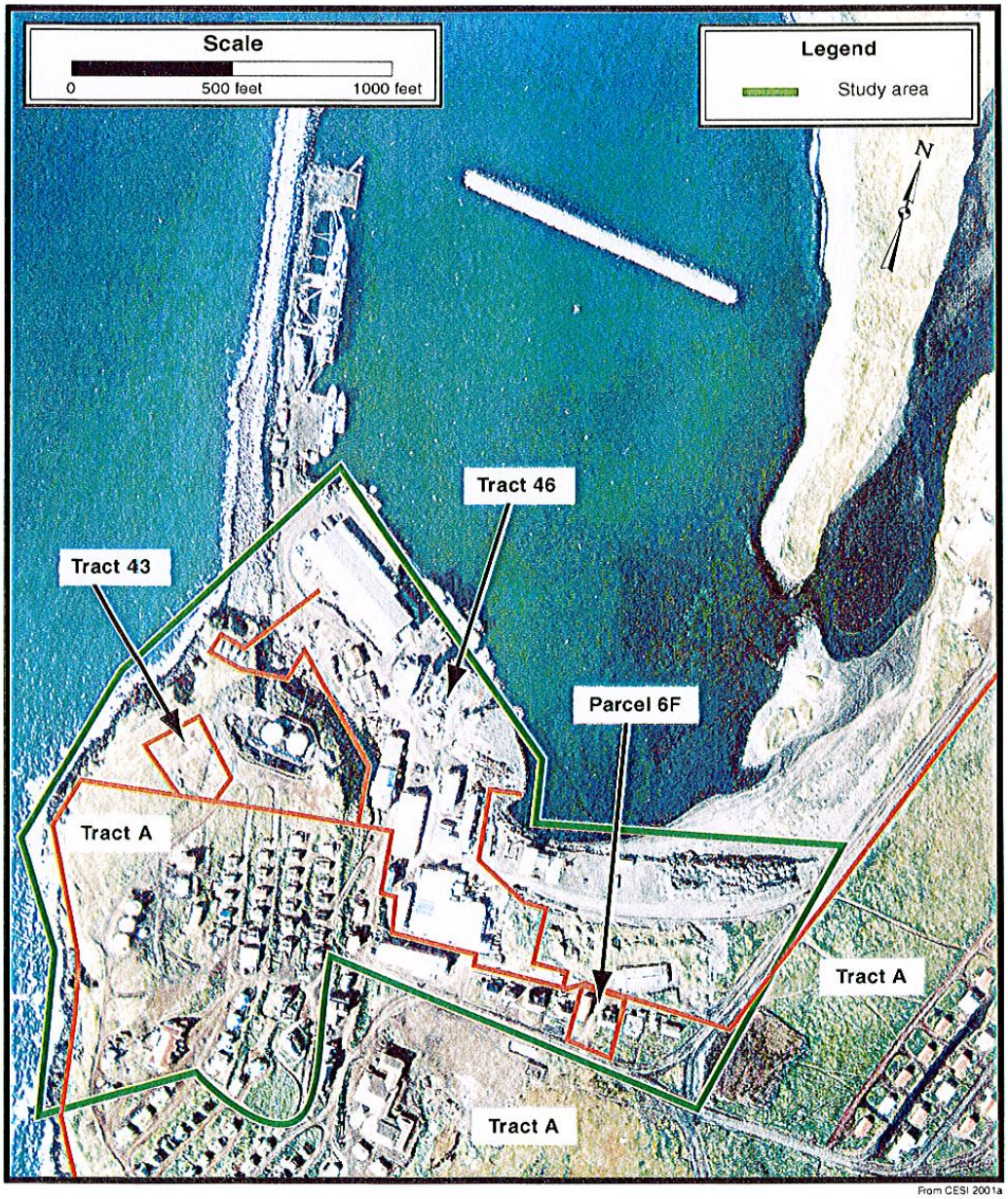
Case Study (cont.)

- Groundwater Determination
  - DEC determined that groundwater beneath the site and the wood waste and ash disposal landfill is not suitable as a potable water supply, as evaluated under 18 AAC 75.350

- 18 AAC 350(1) - Current Use
  - Groundwater at the site is not:
    - Currently used for a public or private drinking water system
    - Within the zone of contribution of an active private or public drinking water system
    - Within a recharge area for a private drinking water well, a wellhead protection area, or a sole source aquifer

Case Study (cont.)

- 18 AAC 75.350(2) - Future Use
  - Documented shallow groundwater and the potential deeper bedrock aquifer are not considered reasonably expected future sources of drinking water because:
    - Bedrock and fractured bedrock drinking water well placement is complex and costly
    - Drinking water wells placed in the shallow fill aquifer and shallow bedrock aquifer at these location will likely be of poor production capacity
    - The site has poor water quality due to saltwater intrusion
    - Practical siting considerations preclude well development in the vicinity of a permitted landfill facility
    - Readily available and less expensive sources of drinking water already exist



From CESI 2001a

Figure 1-1. Location of the Study Area

Case Study (cont.)

- 18 AAC 75.350(3) - Transport
  - Finally, the groundwater flow direction at the site and wood waste and ash disposal landfill will not transport hazardous substances in concentrations that exceed state regulatory limits to groundwater that is a reasonably anticipated future source of drinking water

- Highlights of Selected Remedy
  - The enforceable Environmental Protection Easement and Declaration of Restrictive Covenants includes use restrictions applicable to both the groundwater and land use determinations
  - Drilling of drinking water wells and use of groundwater for drinking water is prohibited
  - The site may not be used for human habitation, in whole or in part, necessitating around-the-clock residence

Glossary

µg/L	micrograms per liter
µhmos/cm	microhmos per centimeter
µS/cm	microSiemens per centimeter
AAC	State of Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
ANCSA	Alaska Native Claims Settlement Act
AST	Aboveground storage tank
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESI	Columbia Environmental Sciences, Inc.
Cr	Chromium
Cr^{+3}	Chromium^{+3}
Cr^{+6}	Chromium^{+6}
DPP	Decommissioned Power Plant
DRO	Diesel range organics
EC	Electrical conductivity
EDPP	East Decommissioned Power Plant
EOSP	East Old Sealing Plant
EPA	U.S. Environmental Protection Agency
gpd/ft	gallons per day per foot
gpm	gallons per minute
GRO	Gasoline range organics
ICP-MS	Inductively coupled plasma-mass spectrometry
IT	IT Alaska, Inc.

MCL	Maximum contaminant level
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NOAA	National Oceanic and Atmospheric Administration
OSP	Old Sealing Plant
PCE	Tetrachloroethene
PL	Public Law
PPO	Pribilof Project Office
ppt	parts per thousand
RRO	Residual range organics
TDS	Total dissolved solids
TPA	Two-Party Agreement
USGS	U.S. Geological Survey
UST	Underground storage tank
WDPP	West Decommissioned Power Plant
WOSP	West Old Sealing Plant
ZOC	Zone of contribution

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

TONY KNOWLES, GOVERNOR

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269-7552
Fax: (907) 269-7649
http://www.state.ak.us/dec/

May 30, 2002

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-0070

RE: Draft Final Groundwater Use and Classification in the Vicinity of Tract 46 TPA 9 St. Paul Island April 30, 2002 Contract No. 50-SPNA-9-00009 Task Order 56-S-NA-90003

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (the Department) received the above document on May 6, 2002. Department staff also attended and participated in a briefing given by NOAA regarding the 18 AAC 75.350 10X Table C groundwater cleanup levels in the Tract 46 (TPA 9) area on May 9, 2002. Below are the Department's general comments regarding NOAA's request for a 10X rule determination for groundwater at Tract 46. Specific comments regarding the document referenced above will be addressed in another letter to NOAA.

General Comments

After reviewing the data and hearing NOAA's briefing, the Department will approve the use of a 10X rule for groundwater cleanup levels in Tract 46. This approval does not modify the Water Quality Standards found in 18 AAC 70, which NOAA must comply with where applicable. The rationale for the Department's approval is based on these site-specific conditions listed below:

- The groundwater in the Tract 46 area is impacted by saltwater intrusion from the nearby Bering Sea, which makes it unfit for drinking water consumption. This is demonstrated with the high levels of total dissolved solids, chloride, and electrical conductivity NOAA has measured in the Tract 46 area.
- The groundwater is not currently used for drinking water and there is no anticipated future use of groundwater in the study area.
- All residents obtain their drinking water from the public water supply system two miles northeast from the city.
- There is no current or future need for the groundwater within the study area to be used as a potential drinking water source. The existing water supply located two miles away from Tract 46 is adequate to meet all anticipated needs for drinking water.

The Tract 46 area includes sixteen (16) distinct soil contaminated sites-e.g. Tract 43, Parcel 6f and Tract A north of Bartlett Ave. and west of Airport Rd. encompassing 45 acres. Department approval is contingent upon NOAA resolving the following issues.

1. NOAA shall consult with the current and future landholders of the property it has transferred and will transfer regarding:

   a) the 10X rule for groundwater cleanup levels and corresponding migration to groundwater cleanup levels for soil,

   b) proper handling and disposal of contaminated soils excavated in the Tract 46 area in accordance with 18 AAC 75.325(i) and 18 AAC 75.370 and,

   c) prohibition of installation of groundwater wells and restrictions on groundwater use for drinking water or other uses.

2. NOAA shall conduct, with DEC participation, a public meeting to discuss the 10X rule for cleanup levels in groundwater, institutional controls on current and future landowners, restriction on groundwater use, proper soil handling and disposal requirements when excavating soil, which is contaminated.

3. NOAA shall develop institutional controls as described in 18 AAC 75.375 which will be incorporated into one or more of the following to prohibit or limit access to the groundwater for use as drinking water or other purposes and that documented contaminated soils are present and must be handled and disposed of in accordance with 18 AAC 75.370:

   - Municipal ordinance,
   - Comprehensive plan,
   - Restrictive covenants,
   - Deed restrictions (or other measures that would be examined during a routine title search),
   - Zoning restriction or land use plan by a local government with land use authority,

The use of institutional controls must, to the maximum extent practicable, be

(1) appurtenant to and run with the land so that the control is binding on each future owner of the site; and

(2) maintained by each responsible person or owner of the site.

If the concentrations of all residual hazardous substances remaining at property located within: Tract 46,Tract 43, Parcel 6f and Tract A, are subsequently determined to be below the applicable cleanup levels, the Department will approve, at the owner's request, elimination of the institutional controls.

If you have any questions regarding this letter, please call Louis Howard at (907) 269-7552.

Sincerely,

Jennifer Roberts
Section Manager

cc: Louis Howard, DEC Anchorage
Breck Tostevin, AGO Anchorage
St. Paul Island RAB Members

2002 Tract 46 75_350.doc

NOAA TPA 9 Tract 46, Tract 43, Parcel 6f and Tract A, genl corr.

Final

LONG TERM GROUNDWATER MONITORING PLAN
St. Paul Island, Alaska

Pribilof Islands Environmental Restoration Project
St. Paul Island, Alaska

August 29, 2005

Prepared By:

National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE
Seattle, Washington 98115

TABLE OF CONTENTS

Section Page

ACRONYMS AND ABBREVIATIONS 1503
EXECUTIVE SUMMARY 1504
1.0 INTRODUCTION 1505
2.0 LONG-TERM GROUNDWATER MONITORING PLANS 1505
2.1 CITY OF ST. PAUL 1505
City of St. Paul Wells: Retention 1506
City of St. Paul Wells: Decommission 1506
City of St. Paul Wells: Transfer/Decommission 1507
2.2 SALT LAGOON DIESEL SEEP 1507
Diesel Seep Wells: Retention 1508
Diesel Seep Wells: Decommission 1509
2.3 ICEHOUSE LAKE 1509
Icehouse Lake Wells: Retention 1509
Icehouse Lake Wells: Decommission 1509
2.4 LUKANIN BAY DEBRIS SITE 1510
Lukanin Bay Wells: Retention 1510
Lukanin Bay Wells: Decommission 1510
2.5 FORMER ST. PAUL LANDFILL 1510
St. Paul Landfill Wells: Retention 1510
St. Paul Landfill Wells: Decommission 1511
2.6 NATIONAL WEATHER SERVICE LANDSPREADING AREA/OIL DRUM DUMP 1511
NWS Landspreading Area/Oil Drum Dump Site Wells: Retention 1512
NWS Landspreading Area/Oil Drum Dump Site Wells: Transfer/Decommission 1512
2.7 VEHICLE BONEYARD 1512
Vehicle Boneyard Wells: Retention 1513
Vehicle Boneyard Wells: Transfer/Decommission 1513
2.8 TELEGRAPH HILL SCORIA PIT 1513
Telegraph Hill Scoria Pit Wells: Retention 1513
Telegraph Hill Scoria Pit Wells: Transfer/Decommission 1514
3.0 GROUNDWATER SAMPLING AND ANALYSIS 1514
3.1 GROUNDWATER SAMPLING METHODOLOGY 1514
3.2 LABORATORY ANALYSIS OF GROUNDWATER SAMPLES 1514
3.3 EQUIPMENT DECONTAMINATION 1514
3.4 ANALYTICAL DATA QUALITY 1514
3.5 WASTE MANAGEMENT 1515
4.0 WELL DECOMMISSIONING 1515
5.0 REFERENCES 1515

FIGURES

Figure
1-1 Location Map, St. Paul Island, Alaska
1-2 Site Map, St. Paul Island, Alaska
2-1 Current Groundwater Monitoring Network, City of St. Paul
2-2 TPA Excavation Sites, City of St. Paul
2-3 Long-Term Monitoring Well Plan, City of St. Paul
2-4 Formerly Used Defense Site, Naval Radio Station Complex
2-5 Groundwater Monitoring Network, Diesel Seep
2-6 Groundwater Monitoring Network, Icehouse Lake
2-7 Groundwater Monitoring Network, Lukanin Bay
2-8 Groundwater Monitoring Network, St. Paul Municipal Landfill
2-9 Groundwater Monitoring Network, National Weather Service Landspreading Area/Oil Drum Dump Site
2-10 Groundwater Monitoring Network, Vehicle Boneyard
2-11 Groundwater Monitoring Network, Telegraph Hill Scoria Pit

TABLES

Table
2-1 Long-Term Plans For St. Paul Monitoring Wells
2-2 City of St. Paul TPA Site Excavation Quantities

ACRONYMS AND ABBREVIATIONS

µg/L	Microgram per liter
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
BTEX	Benzene, Toluene, Ethylbenzene, total Xylene
CWMA	Critical water management area
DRO	Diesel range organics
EPA	U.S. Environmental Protection Agency
GRO	Gasoline range organics
mg/L	Milligram per liter
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
PAH	Polynuclear aromatic hydrocarbons
PCS	Petroleum-contaminated soil
QA	Quality assurance
QC	Quality control
SVOC	Semivolatile organic compound
Tetra Tech	Tetra Tech EM Inc.
TDS	Total dissolved solids
TPA	Two-party Agreement
VOC	Volatile organic compound

EXECUTIVE SUMMARY

This long term groundwater monitoring plan addresses 87 wells installed on St. Paul Island to gather information critical to environmental investigations and remediation planning pursuant to a Two Party Agreement (TPA) between National Oceanic and Atmospheric Administration (NOAA) and the State of Alaska Department of Environmental Conservation (ADEC). Groundwater studies utilizing these wells provide data on contaminant concentration, fate, and transport at island locations where past government operations contributed to the contamination of the site. In the future, a select number of these monitoring wells will be needed for determining groundwater contaminant concentration trends at TPA sites in order to gauge the long term effectiveness of remedial actions, and to monitor for contaminant migration. However, monitoring wells also pose a liability by providing a potential conduit for introducing contaminants to groundwater and being an impediment to use of the land around them. Therefore, wells that are not needed by NOAA for long term groundwater monitoring will be decommissioned in accordance with applicable ADEC requirements or, at some locations, offered for transfer of ownership.

Wells at four sites where NOAA's TPA related remedial activities have been completed will be offered for transfer of ownership to U.S. Department of Defense or a third party that potentially has responsibilities for cleanup in areas monitored by the transferred wells. If the transfers are not accepted within 90 days following an official written offer, then NOAA will decommission these wells.

Monitoring wells addressed by this plan are located at eight sites on St. Paul Island. Of the 87 wells, 36 will be retained for long term monitoring; 20 will be decommissioned; and 31 will either be transferred to parties other than NOAA or decommissioned. The retained wells will be used to monitor groundwater for a minimum of either three or five years depending on the site; thereafter NOAA will evaluate the data and submit a recommendation to ADEC for further sampling or closure. Water samples will be analyzed for contaminants specific to each site. Table 2-1 summarizes plans for wells at each of the St. Paul Island sites; Figures 2-3 through 2-11 provide well locations.

1.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA) National Ocean Service, through its Office of Response and Restoration, Pribilof Project Office, is responsible for site characterization and restoration on St. Paul Island, Alaska. Public Law No. 104-91 of 1996 (Pribilof Environmental Restoration Act) and Public Law 106-562 of 2000 (Pribilof Transition Act) provide the mandate for these activities. The Two-party Agreement (TPA) signed on January 26, 1996, between NOAA and the Alaska Department of Environmental Conservation (ADEC) provides the framework for site restoration (NOAA 1996).

St. Paul Island is the largest of the Pribilof Islands, a five-island archipelago in the Bering Sea (Figure 1-1). The other islands include St. George Island, which is the second largest of the Pribilof Islands, Otter Island, Sea Lion Rock, and Walrus Island. The only inhabited islands are St. Paul and St. George.

This long-term groundwater monitoring plan addresses eight sites on St. Paul Island (Figure 1-2) where NOAA installed 87 monitoring wells to evaluate the nature and extent of groundwater contamination. These sites are:

- St. Paul Landfill (TPA Site 5)
- City of St. Paul (numerous TPA 9 Sites and TPA Site 11)
- Lukanin Bay (TPA Site 12)
- Salt Lagoon Diesel Seep (TPA Site 13)
- Icehouse Lake (TPA Site 14)
- National Weather Service (NWS) Land Spreading Area (non-TPA) /Oil Drum Dump (TPA Site 1)
- Vehicle Boneyard (TPA Site 2)
- Telegraph Hill Scoria Pit (TPA Site 15a)

Formerly Used Defense Sites (FUDS), with environmental remediation responsibilities shared between NOAA and Department of Defense (DOD), are either co-located with or adjacent to: TPA Site 1 (Oil Drum Dump), TPA Site 4 (Vehicle Boneyard), City of St. Paul TPA Site 9i (E-Shop/Radio Building and Duplex), and TPA Site 15a (Telegraph Hill Scoria Pit).

NOAA has completed remedial activities at all eight sites pursuant to the TPA. NOAA conducted groundwater monitoring at all the sites; concentrating on the City of St. Paul (the City), the Salt Lagoon Diesel Seep, Icehouse Lake, Lukanin Bay, and the St. Paul Landfill in 2003 and 2004. Details on island geology, hydrogeology, and groundwater sampling results for these sites can be found in Tetra Tech EM Inc.'s *Final Field Investigation Report, Pribilof Islands Environmental Restoration Project, St. Paul Island, Alaska* (Tetra Tech 2005a).

2.0 LONG-TERM GROUNDWATER MONITORING PLANS

The following sections provide information on the background, remedial actions taken, groundwater monitoring results, planned well disposition and long-term groundwater monitoring plans for each of the eight sites addressed by this document. Table 2-1 summarizes long-term plans for each well.

2.1 CITY OF ST. PAUL

The City consists of the original settlement of the Village of St. Paul, with residential housing, schools and shops situated on a hill overlooking Village Cove and St. Paul Harbor. The City also contains Tract 46, which encompasses most of the harbor front and industrial area (Figure 2-1). TPA sites in the City have petroleum hydrocarbon contamination of soil and groundwater as a result of fuel leaking from storage tanks, leakage from fuel supply pipelines, and spills during fuel transfer operations.

Remedial action sites within the City include many TPA Site 9 sub areas, and the Former Diesel Tank Farm (TPA Site 11). Soil excavations within the City removed nearly 18,000 cubic yards of petroleum-contaminated soil (PCS), resulting in a significant reduction of the amount of vadose zone petroleum available for groundwater con-

tamination. NOAA is in receipt of Conditional Closures from ADEC for all City TPA sites. Conditional Closures stipulate further remedial activities are not required for soil. Figure 2-2 shows the locations of City TPA corrective action sites, and Table 2-2 provides a summary of PCS quantities removed from each site.

Thirty-nine monitoring wells are installed in the City area; NOAA uses these wells to investigate groundwater contamination and flow direction. NOAA conducted groundwater sampling during four consecutive quarters from 2003 to 2004, with analyte selection based on well and soil sampling history and location. Groundwater analytes included gasoline range organics (GRO); diesel range organics (DRO); benzene, toluene, ethylbenzene, and total xylenes (BTEX); select polynuclear aromatic hydrocarbons (PAH); metals; and total dissolved solids (TDS). For detailed analytical results, see Tetra Tech EM Inc.'s *Final Field Investigation Report, Pribilof Islands Restoration Project, St. Paul Island, Alaska* (TTEMI 2005a). Groundwater analyses indicated that areas within the City's harbor/industrial area are highly contaminated with DRO, GRO, benzene, toluene and ethylbenzene; while the City's residential areas are not contaminated with these constituents. For contaminated groundwater in City's harbor/industrial area, ADEC granted NOAA an increase in groundwater contaminant concentration cleanup levels to ten times (10X Rule) the levels listed in Table C of 18 Alaska Administrative Code 75 (18 AAC 75) contingent upon a determination by Alaska Department of Natural Resources (ADNR). A requirement for applying the 10X Rule is that institutional controls must be in place to prevent use of the groundwater for drinking or other purposes. NOAA has applied to ADNR, pursuant to Alaska Statute (AS) 46.15 and 11 AAC 93, for the establishment of a Critical Water Management Area (CWMA). The CWMA provides the institutional controls required for application of the 10X Rule by preventing the issuance of water use permits for groundwater withdrawal within the CWMA boundaries. The proposed 10X Rule and CWMA boundaries around the harbor/industrial area are shown on Figure 2-3. Figure 2-3 also shows estimated contaminant plume distribution and groundwater flow directions based on Mitretek Systems initial draft report *Tidal Corrections for Groundwater Flow in the Critical Water Management Area and the Diesel Seep Site, St. Paul Island, Alaska* (Mitretek 2005).

City of St. Paul Wells: Retention

NOAA will retain the following ten wells as sentinel wells for long-term monitoring (Figure 2-3): MW46-23, MW46-9, MW46-14, MW46-15, MW46-31, MW46-24, MW46-12, MW46-4, MW46-3, and MWA-2. Four quarters of sample analyses have shown that groundwater in the vicinity of these wells is uncontaminated, and the locations of these wells between suspected plume areas and the CWMA boundary make them suitable for monitoring for potential contaminant migration. Sentinel wells will be sampled semiannually for five years; thereafter NOAA will evaluate the data and submit a recommendation to ADEC for further sampling or closure.

NOAA will retain the following nine wells for long-term monitoring of contaminant trends within known plumes (Figure 2-3): MW46-30, MW46-5, MW46-6, MW46-28, MW46-10, MW46-11, MW46-7, MWA-1, and MWA-3. Sample analyses have shown that groundwater is contaminated in the vicinity of these wells to levels above Table C cleanup criteria, and in the case of MW46-6 and MW46-28, above the 10X Rule cleanup criteria. Monitoring these wells will provide an indication of the effectiveness of remedial actions taken to-date (contaminated soil removal) in the harbor/industrial area, with the anticipated result of decreasing contaminant concentration trends. Contaminant trend wells will be sampled annually for five years; thereafter NOAA will evaluate the data and submit a recommendation to ADEC for further sampling or closure.

For all retained wells, groundwater sample analytes will be the previously identified contaminants of concern in Tract 46, namely DRO, GRO and BTEX. Sampling will be conducted in accordance with Section 3.0. Well monitoring will include inspection and photo documentation of well conditions, with expedient repairs or other actions performed when required. NOAA will report analytical results to ADEC semiannually beginning in FY06 contingent on the availability of funds.

City of St. Paul Wells: Decommission

NOAA will decommission the following eleven wells (Figure 2-3): MW46-2, MWA-4, MWA-7, MWA-6, MWA-8, MW46-8, MWA-5, MW46-22, MW46-1, MW46-29, and MW46-21. Sample analyses have shown that groundwater is uncontaminated in the vicinity of these wells. NOAA has completed all soil remedial actions associated with these sites. Retention of these wells for possible future needs is less a consideration than the liability and cost associated with maintaining them. Well decommissioning will be in accordance with Section 4.0. Ad-

ditionally, all retained wells will be decommissioned following completion of long-term monitoring requirements as approved by ADEC.

City of St. Paul Wells: Transfer/Decommission
NOAA will either transfer or decommission the following nine wells (Figure 2-3): MW46-20, MW46-13, MW46-17, MW46-18, MW46-19, MW46-26, MW46-25, MW46-27, and MW46-16. NOAA has been granted a Conditional Closure for TPA Site 9i (Figure 2-2), the only TPA site located within this area of the City (NOAA 2005a). In 2000, Public Law 104-91 was amended with Public Law 106-562 which introduced specific language prohibiting the use of NOAA's Pribilof Islands cleanup funds for remediation of contamination left at Formerly Used Defense Sites (FUDS) on the Pribilof Islands. Additionally, NOAA is not responsible for remediation of contamination caused or contributed to by local entities, officials, or landowners after March 15, 2000; or for releases at any time by third parties on private property following property transfer under the Alaska Native Claims Settlement Act of 1971 or the Transfer of Property Agreement of 1984. Soil and groundwater contamination contributable to historic FUDS activities or more contemporary third party spills is still present in areas monitored by these nine wells (NOAA 2005b). Figure 2-4 is a historic map of a naval radio station complex located in this area. NOAA will offer to transfer ownership and responsibility for these wells to DOD or to a third party. If other parties do not accept the transfer within 90 days following an official written offer, then NOAA will decommission these wells in accordance with Section 4.0.

2.2 SALT LAGOON DIESEL SEEP

The Salt Lagoon Diesel Deep (Diesel Seep), TPA Site 13, is located approximately one-quarter mile north of City Tract 46. The site, situated between the Salt Lagoon Channel and the Polovina Turnpike (Figure 2-5), is the location of a former fur seal by-products plant. Site soil and groundwater contamination resulted from diesel fuel releases from storage tanks, transfer piping, and fueling operations at the plant.

Remediation of the Diesel Seep was first attempted in 1994 (OSC 1995), and then again during the 2004 field season. In 2004, remedial actions included excavation of approximately 10, 300 cubic yards of Petroleum Contaminated Soil (PCS); the installation of two trenches filled with sand bags containing granular activated carbon (GAC), with the trenches running parallel to the lagoon and perpendicular to groundwater flow; and the installation of barrier rock and erosion control fabric along the beach front (NOAA 2005c).

Three consulting firms have investigated groundwater at the Diesel Seep Site since the installation of five monitoring wells in 2000. The consultants were Columbia Environmental Services, Inc. (CESI) in 2000 (CESI 2001), IT Alaska, Inc, (IT) in 2001 (IT 2002), and Tetra Tech in 2004 (Tetra Tech 2005a). IT's and Tetra Tech's investigation reports conflict with the CESI report regarding well identifications. IT's analytical results also seemingly conflict with results from the CESI and Tetra Tech investigations for three wells. For clarity, the following table and discussion summarizes the history of groundwater monitoring at the Diesel Seep Site, and proposes explanations for noted report discrepancies.

Diesel Seep	**Well 1**	**Well 2**	**Well 3**	**Well 4**	**Well 5**
CESI 2000					
Report's Well ID	MWDS-1	MWDS-2	MWDS-3	MWDS-4	MWDS-5
GRO (µg/L)	190	ND	ND	ND	ND
DRO (µg/L)	**9000**	83	400	130	150
IT 2001					
Report's Well ID	MWDS-2	MWDS-1	MWDS-3	MWDS-4	MWDS-5
GRO (µg/L)	ND	ND	ND	ND	ND
DRO (µg/L)	320	ND	**2500**	130	ND

Diesel Seep	Well 1	Well 2	Well 3	Well 4	Well 5
Tetra Tech April 2004					
Report's Well ID	MWDS-2	MWDS-1	MWDS-3	MWDS-4	MWDS-5
GRO (µg/L)	85	ND	ND	ND	ND
DRO (µg/L)	**2900**	ND	370	110	75
Tetra Tech July 2004					
Report's Well ID	MWDS-2	MWDS-1	MWDS-3	MWDS-4	MWDS-5
GRO (µg/L)	76	ND	ND	ND	ND
DRO (µg/L)	**2700**	ND	240	100	ND

Bold Result– Above ADEC Table C criteria.
ND – Not detected above Practical Quantitation Limit.

CESI installed five monitoring wells at the Diesel Seep Site in 2000. The CESI report identified the generic "Well 1" in the table above as "MWDS-1" and "Well 2" as "MWDS-2" (see Figure 5, CESI 2001). As indicated in the above table, the IT report (see Figure 3, IT 2002) reversed the identification of these wells. All reports generated subsequent to the IT report used IT's identification, *i.e.*, "Well 1" became "MWDS-2", and "Well 2" became "MWDS-1".

A possible discrepancy also exists with the assignment of IT's DRO analytical results between "Well 1" and "Well 3". The IT "Well 1" result of 320 µg/L differs significantly from the CESI and Tetra Tech DRO results that were above the ADEC cleanup criterion of 1,500 µg /L. Similarly, the IT "Well 3" DRO result of 2,500 µg/L differs significantly from CESI's and Tetra Tech's DRO results that were well below cleanup levels. As indicated by the table above, if IT's DRO "Well 1" and "Well 3" results were reversed, then they would closely match the corresponding levels found at those wells by CESI and Tetra Tech. IT's report does not provide clues that the wells were misidentified during sampling, or sample labels/results were inadvertently switched in the field or the lab. However, DRO results shown in the above table suggest that IT inadvertently misidentified the two wells.

In 2003 and 2004, prior to the 2004 PCS excavations, quarterly groundwater samples were drawn and analyzed for GRO, DRO, BTEX, and lead. Analytical results indicated that groundwater in the vicinity of monitoring well MWDS-2 (Figure 2-5) is contaminated with DRO in concentrations above the ADEC Table C cleanup level of 1500; no other analytes were found above Table C requirements at MWDS-2, and groundwater in the vicinity of the other Diesel Seep monitoring wells is below Table C cleanup levels for all analytes (Tetra Tech 2005a).

Diesel Seep Wells: Retention

NOAA will retain MWDS-3 as a sentinel well (Figure 2-5). The location and analytical history (below ADEC cleanup standards) of this well are suitable for monitoring DRO migration at the edge of the 2004 PCS excavation. Additionally, visual inspections for petroleum sheen on the Salt Lagoon Channel will be conducted, coincident to well monitoring, to check the effectiveness of the GAC trenches in preventing residual petroleum from entering the lagoon. MWDS-3 will be sampled semiannually for three years; thereafter NOAA will evaluate the data and submit a recommendation to ADEC for further sampling or closure.

NOAA will retain MWDS-2 for long-term monitoring of contaminant trends (Figure 2-5). Groundwater in the vicinity of MWDS-2 is contaminated with DRO, however, due to the removal of PCS during the 2004 field season, the DRO concentration is expected to decrease over time. MWDS-2 will be sampled annually for three years; thereafter NOAA will evaluate the data and submit a recommendation to ADEC for further sampling or closure.

For retained wells, the groundwater sample analyte will be DRO. Sampling will be conducted in accordance with Section 3.0. Monitoring will include inspection and photo documentation of well conditions, with expedient repairs or other actions performed when required. Future sampling requirements will be determined based on initial three-year results. Reports of analytical results will be provided to ADEC semiannually beginning in FY06 contingent on the availability of funds.

Diesel Seep Wells: Decommission
NOAA will decommission the following 3 wells (Figure 2-5): MWDS-1, MWDS-4, and MWDS-5. Sample analyses have shown that groundwater is uncontaminated in the vicinity of these wells. NOAA has completed all soil remedial actions associated with the Diesel Seep Site (NOAA 2005c). Retention of these wells for possible future needs is less a consideration than the liability and cost associated with maintaining them. Well decommissioning will be in accordance with Section 4.0. Additionally, all retained wells will be decommissioned following completion of long-term monitoring requirements as approved by ADEC.

2.3 ICEHOUSE LAKE

The Icehouse Lake Site, TPA Site 14, is located approximately one mile north of the St. Paul Village, adjacent to Icehouse Lake and a prominent bend in Polovina Turnpike, the road that passes west of the site (Figure 2-6). The site, which consists of an open, graded, scoria pad adjacent to the eastern edge of the lake is identified as the Icehouse Lake Debris Site in the TPA. From the 1930s to the late 1950s, a diesel-powered pump was used to supply lake water to St. Paul Village for drinking water. The Icehouse Lake pumphouse and other structures were demolished in the early 1990s and a scoria pad was added for access to the lake. Fuel storage and disposal practices related to the former pumphouse introduced contamination to soil and groundwater at the site.

Soil remediation of this site was completed in 2004 with the excavation of 72 cubic yards of PCS (NOAA 2005d).

Six monitoring wells are installed at Icehouse Lake. In 2003 and 2004, quarterly groundwater samples were drawn and analyzed for GRO, DRO, BTEX, PAH, metals and TDS. Analytical results indicate that groundwater in the vicinity of monitoring well MWIHL-4 is consistently contaminated with GRO, DRO, and lead in concentrations above the ADEC Table C cleanup criteria; no other analytes were found above Table C levels at MWIHL-4, and groundwater in the vicinity of the other Icehouse Lake monitoring wells is below Table C cleanup levels for all analytes (Tetra Tech 2005a).

Icehouse Lake Wells: Retention
NOAA will retain MWIHL-2 and MWIHL-6 as a sentinel wells (Figure 2-6). Groundwater flow in this area is directed away from the lake and toward MWIHL-2 and MWIHL-6 (IT 2001). These wells are suitable for monitoring contaminant migration due to their location down-gradient of MWIHL-4 and their analytical history below ADEC cleanup standards. MWIHL-2 and MWIHL-6 will be sampled semiannually for three years; thereafter, NOAA will evaluate the data and submit a recommendation to ADEC for further sampling or closure.

NOAA will retain MWIHL-4 for long-term monitoring of contaminant trends (Figure 2-6). Groundwater in the vicinity of MWIHL-4 is contaminated, however excavation of PCS during the 2004 field season should promote a decrease in contaminant concentrations over time. MWIHL-4 will be sampled annually for three years; thereafter, NOAA will evaluate the data and submit a recommendation to ADEC for further sampling or closure.

For retained wells, the groundwater sample analytes will be GRO, DRO, total and dissolved lead. Sampling will be conducted in accordance with Section 3.0. Monitoring will include inspection and photo documentation of well conditions, with expedient repairs or other actions performed when required. Reports of analytical results will be provided to ADEC semiannually beginning in FY06 contingent on the availability of funds.

Icehouse Lake Wells: Decommission
NOAA will decommission the following 3 wells (Figure 2-6): MWIHL-1, MWIHL-3, and MWIHL-5. Sample analyses have shown that groundwater is uncontaminated in the vicinity of these wells. All soil remedial actions associated with the Icehouse Lake site have been completed (NOAA 2005d). Retention of these wells for possible future needs is less a consideration than the liability and cost associated with maintaining them. Well decommissioning will be in accordance with Section 4.0. Additionally, all retained wells will be decommissioned following completion of long-term monitoring requirements as approved by ADEC.

2.4 LUKANIN BAY DEBRIS SITE

The Lukanin Bay Debris Site, TPA Site 12, is located about one mile northeast of the St. Paul Village, approximately 300 feet inland from Lukanin Bay (Figure 2-7). The site encompasses land on both sides of Diamond Hill Road, which transects the site. The site is characterized by vegetated, rolling sand dunes that slope generally eastward toward Lukanin Bay.

TPA Site 12 was previously used for the disposal of metal and wood debris, general household waste, metal drums, government vehicles and steel storage tanks. Corrective actions were completed at the site in 2004 that included excavation of 1,778 cubic yards of PCS and removal of approximately 395 cubic yards of debris such as drum remains, scrap wood and metal (Tetra Tech 2005b).

Three monitoring wells are installed at Lukanin Bay. In 2003 and 2004, quarterly groundwater samples were drawn and analyzed for GRO, DRO, BTEX, PAH, metals and TDS. Analytical results indicate that groundwater is not contaminated at the Lukanin Bay Debris Site (Tetra Tech 2005a).

Lukanin Bay Wells: Retention

NOAA will not retain any wells at the Lukanin Bay Debris Site.

Lukanin Bay Wells: Decommission

NOAA will decommission the following 3 wells (Figure 2-7): MWLB-1, MWLB-2, and MWLB-3. Sample analyses have shown that groundwater is uncontaminated in the vicinity of these wells. NOAA has completed all remedial actions associated with the Lukanin Bay Debris Site and has been granted a Conditional Closure by ADEC (NOAA 2005e). Retention of these wells for possible future needs is less a consideration than the liability and cost associated with maintaining them. Well decommissioning will be in accordance with Section 4.0.

2.5 FORMER ST. PAUL LANDFILL

The former St. Paul Municipal Landfill, TPA Site 5, is located about 3 miles north of St. Paul Village. This site was an active landfill that accepted the island community's municipal waste, demolition and construction debris, and served as a disposal area for used oil. NOAA conducted several remedial actions at the landfill from 2000 to 2004 to address municipal solid waste issues and petroleum contamination at sub-TPA Sites 5b, 5c, and 5d, which are owned by the City (Tetra Tech 2004). Conditional Closures have been approved by ADEC for Site 5b (approved November 15, 2004), Site 5c (approved April 11, 2005) and Site 5d (approved February 11, 2005). NOAA retains ownership of a portion of the landfill designated TPA Site 5a (Cell C) within property Tract 42. Cell C was capped with PCS in 2004 (NOAA 2005f).

Cell C contains 25,267 cubic yards of PCS from various TPA sites on St. Paul Island. As required by applicable Corrective Action Plans (CAP), the PCS was sampled prior to being placed on Cell C. Sample analytical results indicated the contaminants of concern for PCS at Tract 42 are GRO, DRO, and BTEX.

Eight monitoring wells are currently installed at St. Paul Landfill. In 2003 and 2004, quarterly groundwater samples were drawn from 5 wells at the site (one of which was subsequently decommissioned to allow for completion of installation of Cell C) and analyzed for GRO, DRO, BTEX, PAH, metals and TDS. Analytical results indicated that groundwater is uncontaminated in the vicinity of St. Paul Landfill, with the exception that in October 2003 monitoring well MWSNPLF-1 (Figure 2-8) had one lead analysis at 16.4 µg/L, which is slightly above the ADEC cleanup criterion of 15 µg/L (Tetra Tech 2005a). This result may be an anomaly because all other lead results have been well below cleanup levels, and PCS within Cell C has been sampled and found not contaminated with lead concentrations above the ADEC Table B "Migration to Groundwater" cleanup criterion.

St. Paul Landfill Wells: Retention

ADEC Solid Waste regulations require long-term groundwater monitoring of closed landfill sites. NOAA will retain all eight remaining wells at the St. Paul Landfill site to monitor for contaminant migration associated with former disposal activities in and around Tract 42 (Figure 2-8). The monitoring wells include MWSNPLF-1, MWSNPLF-10, HC-4, MWSNPLF-9, HC-5, MWSNPLF-11, MWSNPLF-12 and MWSNPLF-13. Note that

although MWSNPLF-9 and HC-5 are located close together, these wells are both needed to monitor the entire aquifer due to differing screen depths. The St. Paul landfill monitoring wells will be sampled annually for five years; thereafter, NOAA will evaluate the data and submit a recommendation to ADEC for further sampling or closure. Post-closure monitoring of the Cell C cover is specified in NOAA's Cell C (Tract 42) closure report (NOAA 2005f).

For retained wells, the groundwater sample analytes will be GRO, DRO, BTEX, total and dissolved lead. Sampling will be conducted in accordance with Section 3.0. Monitoring will include inspection and photo documentation of well conditions, with expedient repairs or other actions performed when required. Future sampling requirements will be determined based on initial five-year results. Reports of analytical results will be provided to ADEC annually beginning in FY06 contingent on the availability of funds.

St. Paul Landfill Wells: Decommission

Retained wells will be decommissioned following completion of long-term monitoring requirements as approved by ADEC.

2.6 NATIONAL WEATHER SERVICE LANDSPREADING AREA/OIL DRUM DUMP

The NWS Landspreading Area/Oil Drum Dump Site is located about 3.5 miles northeast of the City of St. Paul, about 1.5 miles east of the St. Paul airport, and is separated from the Bering Sea by several dune ridges. The landspreading area is accessed by the main road running from the airport, while the Oil Drum Dump (TPA Site 1) is served by an unimproved, unmarked road running north-south, terminating at TPA Site 1 (Figure 2-9).

NOAA's Pribilof Project Office chose landspreading as a practicable means of achieving remediation of PCS excavated from various locations on St. Paul Island. Approximately 2,600 cubic yards of PCS was spread in an 18-inch deep layer across National Weather Service (NWS) property in 2004 (NOAA 2005f). The PCS layer was periodically tilled during 2004 to allow organics to volatize. In 2005, the landspreading area will be seeded with local varieties of grass to help prevent wind and water erosion during natural biodegradation of petroleum contaminants in the soil. In 2004, NOAA installed wells MWLS-1, MWLS-2, and MWLS-3 (Figure 2-9) to monitor for contaminants migrating from the PCS layer to groundwater.

Northeast of the landspreading area is the location of the Oil Drum Dump Site, which was used as a disposal area for drums and debris during the 1940s and later decades. Department of Defense identifies the Oil Drum Dump Site as Formerly Used Defense Site B-1 (FUDS B-1). In 1986, a DOD contractor (Chase Construction, Inc.) removed approximately 4,000 waste drums and metal debris from this area (NOAA 2004a). At this time, DOD constructed a centrally located gravel pad for drum staging. At the end of the 1986 action, over 300 waste drums, determined to be "non DOD related", were left on the central pad. In 1992 a DOD environmental consultant (Ecology & Environment Inc.) investigated FUDS B-1 and observed approximately 350 rusting drums on the central pad, petroleum odors, petroleum saturated soils, partially buried drums in the surrounding FUDS B-1 area, and various debris still remaining at the site. In 1992 a DOD contractor (Harding and Lawson Associates) consolidated drum contents and removed approximately 200 drums, leaving over 100 waste drums on the central pad. In 1994, another DOD consultant (Woodward-Clyde) performed a site inspection and observed approximately 100 drums, some leaking, on the central pad. In 1994, DOD contractor Oil Spill Consultants found 174 drums and heavy soil contamination due to drum punctures. Oil Spill Consultants consolidated drum contents and removed the remaining drums from the central pad. After the 1994 DOD action, known soil contamination and miscellaneous debris still remained at FUDS B-1.

In 1996, the TPA was signed and the central pad within FUDS B-1 was designated TPA Site 1 (Oil Drum Dump). In 1996, NOAA collected surface soil samples from the central pad area (NOAA 2004a). Analytical results of these samples confirmed the earlier observations of petroleum contamination of TPA Site 1 resulting from DOD drum handling and storage activities between 1986 and 1994. In 1997, as part of a cooperative agreement with NOAA, Bering Sea Eccotech, Inc. removed the majority of the surface debris remaining in the area. In 1999, NOAA consultants installed the five Oil Drum Dump Site monitoring wells (Figure 2-9); and collected soil and groundwater samples from FUDS B-1, including TPA Site 1. Analytical results of the soil and groundwater samples confirmed earlier observations of contamination remaining at FUDS B-1 (NOAA 2004a).

NWS Landspreading Area/Oil Drum Dump Site Wells: Retention
ADEC does not require NOAA to monitor groundwater at the NWS landspreading area. However, NOAA will retain the following four wells for long-term monitoring of contaminant trends (Figure 2-9): MWLS-1, MWLS-2, MWLS-3, and MWODDS-4 to address concerns posed by NOAA's Weather Service which manages the property. The locations of these wells near the area where PCS was placed on NWS property make them suitable for monitoring contaminant migration from the PCS to groundwater in the area. MWLS-1, MWLS-2, and MWLS-3 have not been sampled previously. Analyses of samples drawn from MWODDS-4 in 1999 indicate all contaminants below ADEC cleanup criteria (NOAA 2004a). Wells will be sampled annually under this long-term monitoring plan for three years beginning in FY06 contingent on the availability of funds; thereafter NOAA will evaluate the data and determine whether further sampling or closure is appropriate.

For all retained wells, groundwater sample analytes will be the contaminants of concern for PCS excavated from TPA Sites on St. Paul Island, *i.e.*, DRO, GRO and BTEX. Sampling will be conducted in accordance with Section 3.0. Well monitoring will include inspection and photo documentation of well conditions, with expedient repairs or other actions performed when required. Although not required, reports of analytical results will be provided to ADEC annually.

NWS Landspreading Area/Oil Drum Dump Site Wells: Transfer/Decommission
NOAA will either transfer to DOD or decommission the following four wells (Figure 2-9): MWODDS-1, MWODDS-2, MWODDS-3, and MWODDS-5. Documented Department of Defense drum handling practices at TPA Site 1 (central gravel pad for FUDS B-1) resulted in soil and groundwater contamination at this site. Any future cleanup of FUDS B-1/TPA Site 1 cannot, by public law, be funded by NOAA. NOAA cannot expend Pribilof cleanup funds to inspect and maintain these wells. NOAA will offer to transfer ownership and responsibility for these wells to DOD. If the transfer is not completed within 90 days following an official written offer, NOAA will decommission these wells in accordance with Section 4.0.

2.7 VEHICLE BONEYARD

The Vehicle Boneyard (TPA Site 2) is located on the eastern portion of St. Paul Island north of Polovina Hill and south of Big Lake. The major portion of the site, the Vehicle Boneyard proper, was used for disposal of old vehicles, drums, and debris. The northwestern portion of the site was reportedly used for disposal of emptied drums and debris originating from FUDS B-1 and FUDS C during DOD remediation of those sites in 1986. The TPA Site 2 and the reported FUDS disposal area border (to the south and east) the proposed location for a new landfill for Saint Paul Island. The site is served by an unmarked access road running east/west and connecting with the Polovina Turnpike to the east and Little Polovina Road to the west. Access control is by a locked gate from the east and a warning sign from the west.

NOAA contractor Harding Lawson Associates drained fluid from 240 vehicles in 1992. In 1994, Oil Spill Consultants identified and removed 213 drums from the site. In 1997, Bering Sea Eccotech, Inc. (BSE) removed approximately 2,460 tons of bulk surface debris (metal, tires, and batteries) from the Vehicle Boneyard and other smaller sites. No stained soils were observed at the Vehicle Boneyard during debris removal. In 2003, NOAA consolidated remaining surface debris in a single location and placed a two-foot thick clean material cover over it. The cover material was graded and contoured to ensure proper surface runoff. In 2004, NOAA completed erosion control measures that included fertilizing and seeding the cover with native grass varieties, and installing erosion control matting (Tetra Tech 2005c).

In 1999, Tetra Tech EM, Inc. removed 18.5 tons of debris from the site, and performed subsurface soil sampling at ten locations. Only one location had analytical results for DRO and RRO above ADEC cleanup criteria. In 2000, 13 monitoring wells were installed; in 2000 and 2001, five rounds of groundwater samples were taken and analyzed for GRO, DRO, RRO, VOCs, PAHs, and metals. No contaminant analyte concentrations exceeded ADEC cleanup levels (Tetra Tech 2005c).

Vehicle Boneyard Wells: Retention
NOAA will not retain any wells at Vehicle Boneyard. Inspection and maintenance of the TPA Site 2 cover material are specified in NOAA's Vehicle Boneyard Corrective Action Report (Tetra Tech 2005c).

Vehicle Boneyard Wells: Transfer/Decommission
NOAA will either transfer to DOD or the City of St. Paul (for possible use with the new municipal landfill site) the following 13 wells: MWVB-1 through MWVB-13 (Figure 2-10), or NOAA will decommission any wells not transferred to the aforementioned entities. Wells will be decommissioned in accordance with Section 4.0.

2.8 TELEGRAPH HILL SCORIA PIT

The Telegraph Hill scoria pit site is designated TPA Site 15-1 by NOAA, and as FUDS C by DOD. The site is located along the northwest side of Telegraph Hill, about two miles north of the City of St. Paul. Telegraph Hill reportedly received its name from the establishment of a military telegraph station atop its summit. In the past, the site was used as an oil drum and debris disposal area. Currently, as well as historically, the site is quarried for volcanic scoria. The following is a summary of remedial activities and investigations conducted at the Telegraph Hill Scoria Pit, more detailed information can be found in NOAA's *Final Site Characterization Report, Telegraph Hill Scoria Pit Site, Two-Party Agreement Site No. 15-1, Pribilof Islands Environmental Restoration Project, St. Paul Island, Alaska* (NOAA 2004b).

In 1986, DOD contractor Chase Construction, Inc. remov ed an estimated 4,000 drums and various debris from FUDS C.

In 1992, an assessment by Ecology and Environment, Inc. observed two power shovels and approximately 175 rusted drums in the area, but no soil staining.

In 1997, Aleutian Enterprises removed the power shovels and drum debris.

In 1999, Tetra Tech performed a debris survey and observed crushed drums that had been excavated during scoria mining. These drums purportedly had been buried at the site in the 1940's and 1950's and were relics of the World War II era. Tetra Tech also observed approximately 100 newer intact drums stockpiled near the southern boundary of the active quarry pit, but could not determine when the drums had been placed there. Tetra Tech could not confirm that any of the observed debris and drums originated from NOAA activities. Tetra Tech observed only one small area of surface soil staining; analyses of a sample taken from this spot indicated only DRO slightly above ADEC cleanup standards (GRO, RRO, VOCs and BTEX were not detected).

In 2000, BSE and Nortech removed drums and other debris from the site. Metallic debris was barged to Seattle, Washington for recycling. No soil staining, stressed vegetation, hydrocarbon odors, or other indication of contamination was observed during removal actions.

In 2000, CESI installed monitoring wells MWTH-1 through MWTH-5 (Figure 2-11), and conducted soil and groundwater sampling. The petroleum-stained soil area sampled in 1999 by Tetra Tech was included in CESI's sampling. In 2001 IT conducted groundwater sampling. Analytical results from the CESI and IT sampling events were all below applicable ADEC cleanup criteria, or below background concentration levels in the case of metals.

A review of the analytical results from all sampling conducted at TPA Site 15-1 leads to the conclusion that this site is not contaminated (NOAA 2004b). Additionally, historic records indicate that past use of this site as an oil drum and debris disposal area was likely tied to DOD activities, therefore under PL-106-562 NOAA cannot expend funds to maintain monitoring wells at this site.

On August 24, 2004, ADEC determined that no further action was required at TPA 15-1 Telegraph Hill (ADEC 2004).

Telegraph Hill Scoria Pit Wells: Retention
NOAA will not retain any wells at Telegraph Hill Scoria Pit.

Telegraph Hill Scoria Pit Wells: Transfer/Decommission
NOAA will either transfer to DOD or decommission the following five wells (Figure 2-11): MWTH-1, MWTH--2, MWTH--3, MWTH-4, and MWTH--5. However, with site investigation sampling results indicating that soil and groundwater contamination in below ADEC cleanup criteria, it is likely DOD will decline receiving these wells and they will be decommission by NOAA in accordance with Section 4.0.

3.0 GROUNDWATER SAMPLING AND ANALYSIS

Groundwater sampling methodology, laboratory analyses, equipment decontamination procedures, and analytical data quality are described in the following sections.

3.1 GROUNDWATER SAMPLING METHODOLOGY

The retained monitoring wells will be sampled using a low-flow groundwater sampling technique in accordance with an approved standard operating procedure (SOP) for micropurging and sampling of groundwater.

Prior to sampling, the static water level in the well will be measured using an electronic water level indicator. The wells will then be purged using a GEOPUMP peristaltic pump (wells where water table is less than 30 feet deep below the ground surface) or a Grundfos Rediflo2™ submersible pump (wells where the water table is deeper than 30 feet below the ground surface) with dedicated low-density polyethylene tubing. In general, the wells will be purged at a low-flow rate (less than 500 milliliters per minute) while pH, temperature, conductivity, turbidity, dissolved oxygen, and oxidation-reduction potential will be monitored. After water quality parameters have stabilized in the well according to readings on a water quality meter, groundwater samples will be collected. During collection of groundwater samples for volatile organic compound (VOC) and gasoline range organics (GRO) analyses, the pumping rate will be reduced to less than 200 milliliters per minute to minimize the loss of VOCs. Samples to be evaluated for dissolved lead will filter in the field using a 0.45-micron filter, then preserved to <2 pH units with reagent-grade nitric acid. After samples have been collected, each sample container will be placed in a cooler with frozen gel packs to maintain the temperature at 4 °C +/- 2 °C.

3.2 LABORATORY ANALYSIS OF GROUNDWATER SAMPLES

Groundwater samples will be shipped overnight to an ADEC approved fix lab for analysis. Groundwater samples will be analyzed using the following analytical methods:

- GRO by ADEC Method AK101
- DRO by ADEC Method AK102
- BTEX by U.S. Environmental Protection Agency (EPA) Method 8260B
- Lead by EPA Method 6020

3.3 EQUIPMENT DECONTAMINATION

Before and after each deep monitoring well is sampled, the submersible pump will be decontaminated. The pump will be placed in a clean bucket that contains a solution of hot tap water and Alconox soap, and a piece of new, dedicated tubing of sufficient length to redirect the flow from the pump back into the bucket will be attached to the pump. The pump will be turned on and allowed to recirculate in the bucket for a minimum of five minutes. The inside of the pump will then be rinsed using clean tap water in a bucket, allowing the pump to run for a minimum of three minutes.

3.4 ANALYTICAL DATA QUALITY

Analytical data quality will be evaluated per the procedures of NOAA's Master Quality Assurance Plan (NOAA 2003a).

3.5 WASTE MANAGEMENT

Waste generated as a result of monitoring well sampling will be managed in accordance with NOAA's Master Investigation-Derived Waste Plan (NOAA 2003b).

4.0 WELL DECOMMISSIONING

Well decommissioning shall be conducted in accordance with requirements specified in 18 AAC 75.345(j).

Well decommissioning activities will be documented on completed Well Abandonment Forms that will be forwarded to the ADEC, Division of Environmental Health, Drinking Water Program.

5.0 REFERENCES

ADEC 2003. Title 18 of the Alaska Administrative Code 75, Articles 3 and 9. Oil and Hazardous Substances Pollution Control Regulations. State of Alaska. Effective date January 30, 2003.

ADEC 2004. Letter (File No. 2644.38.030) From Mr. Louis Howard (ADEC) to Mr. John Lindsay (NOAA) Re: Telegraph Hill Two-Party Agreement (TPA) Site 15, St. Paul Island Alaska. Dated August 24, 2004.

CESI 2001. Draft Site Characterization Report, Salt Lagoon Diesel Seep (TPA Site 13), St. Paul Island, AK. Columbia Environmental Sciences, Inc. April 26.

IT 2001. Draft Site Characterization Report for Icehouse Lake (TPA Site 14), St. Paul Island, Alaska. IT Alaska, Inc. December.

IT 2002. Draft Site Characterization Report for Salt Lagoon Diesel Seep (TPA Site 13), St. Paul Island, Alaska. IT Alaska, Inc. February.

Mitretek 2005. Initial Draft Tidal Corrections for Groundwater Flow in the Critical Water Management Area and the Diesel Seep Site, St. Paul Island, Alaska. Mitretek Systems. May 5.

NOAA 1996. Pribilof Islands Environmental Restoration Two-Party Agreement, Attorney General's Office File No. 661-95-0126. National Oceanic and Atmospheric Administration. January 26.

NOAA 2003a. Master Quality Assurance Plan. Prepared for Work on Pribilof Islands, Alaska. National Oceanic and Atmospheric Administration's Pribilof Project Office. August.

NOAA 2003b. Master Investigation-Derived Waste Plan. Prepared for Work on Pribilof Islands, Alaska. National Oceanic and Atmospheric Administration's Pribilof Project Office. May.

NOAA 2004a. Final Site Characterization Report, Oil Drum Dump Site (Two-Party Agreement Site No. 1 and Formerly Used Defense Site B-1), Pribilof Islands Environmental Restoration Project, St. Paul Island, Alaska. November.

NOAA 2004b. Final Site Characterization Report, Telegraph Hill Scoria Pit Site, Two-Party Agreement Site No. 15-1, Pribilof Islands Environmental Restoration Project, St. Paul Island, Alaska. December.

NOAA 2005a. Request for Conditional Closure, TPA Site 9i, NOAA Site 24, Duplex Building and E-Shop, St. Paul Island, Alaska. Approved by ADEC February 11, 2005.

NOAA 2005b. The History of Parcel 6f, the ATCO Building, and the Windmill Wells on ST. Paul Island, Alaska as it Relates to Soil and Groundwater Cleanup Needs and Responsibilities. June 2005.

NOAA 2005c. Corrective Action Report, Sites 34 and 35/TPA Sites 13a and 13b –Salt Lagoon Diesel Seep, St. Paul Island, Alaska. Draft report pending.

NOAA 2005d. Final Corrective Action Report, Icehouse Lake (Site 36/TPA Sites 14), St. Paul Island, Alaska. May 24.

NOAA 2005e. Request for Conditional Closure, Lukanin Bay Site, TPA Sites 12a, 12b, 12c/NOAA Sites 31, 32, 33, St. Paul Island, Alaska. Approved by ADEC May 5, 2005.

NOAA 2005f. Closure Report, Site 5 /TPA Site 5a – St.. Paul Landfill Cell C (Tract 42), St. Paul Island, Alaska. Draft report pending.

OSC 1995. Final Report, Contaminated Soil Excavation and Stockpile on St. Paul Island, Alaska. Oil Spill Consultants. April.

Tetra Tech 2004. Final Closure Report Site 6/TPA Site 5b – St. Paul Landfill Cell A Site 7/TPA Site 5c – St. Paul Landfill Cell B (Drum Dump) Site 8/TPA Site 5d – St. Paul Island Landfill Cell B (Solid Waste) St. Paul Island, Alaska. Tetra Tech EM Inc. November 30.

Tetra Tech 2005a. Final Field Investigation Report, Pribilof Islands Environmental Restoration Project, St. Paul Island, Alaska. Tetra Tech EM Inc. June 23.

Tetra Tech 2005b. Final Corrective Action Report, Site 33/TPA Site 12c– Lukanin Bay PCS Site, St. Paul Island, Alaska. Tetra Tech EM Inc. March 16.

Tetra Tech 2005c. Final Corrective Action Report, Site 2/TPA Site 2 – Vehicle Boneyard, St. Paul Island, Alaska. Tetra Tech EM Inc. February 24.

FIGURES

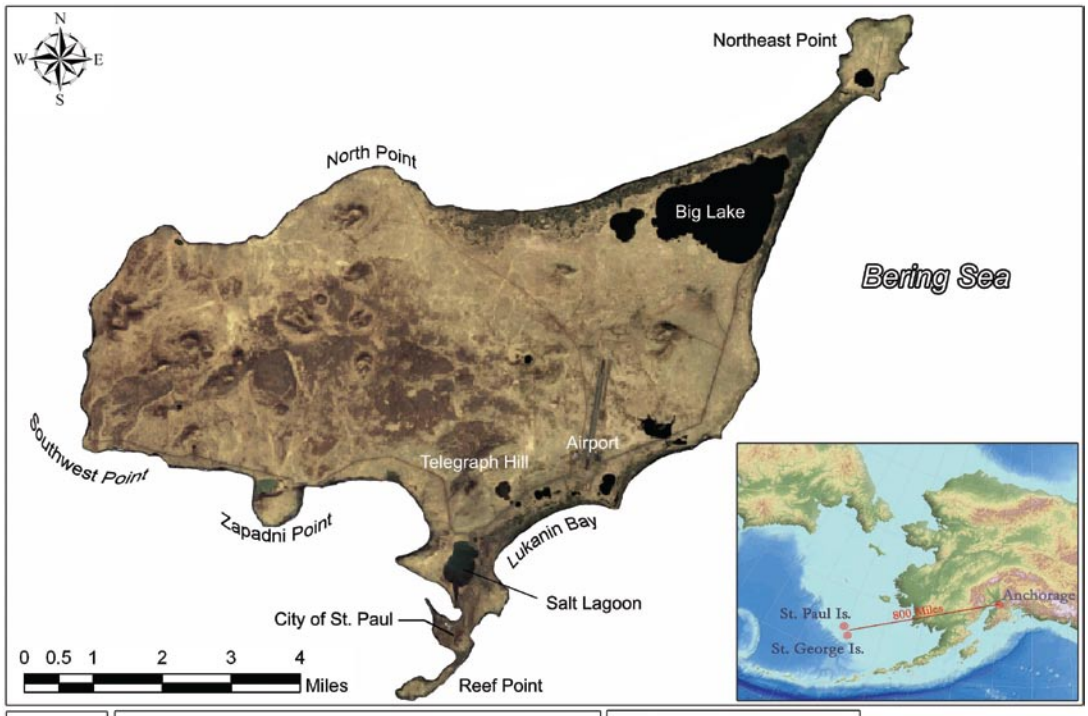


Figure 1-1	St. Paul Island Vicinity Map St. Paul Long Term Monitoring Plan St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001	Pribilof Islands Restoration Project

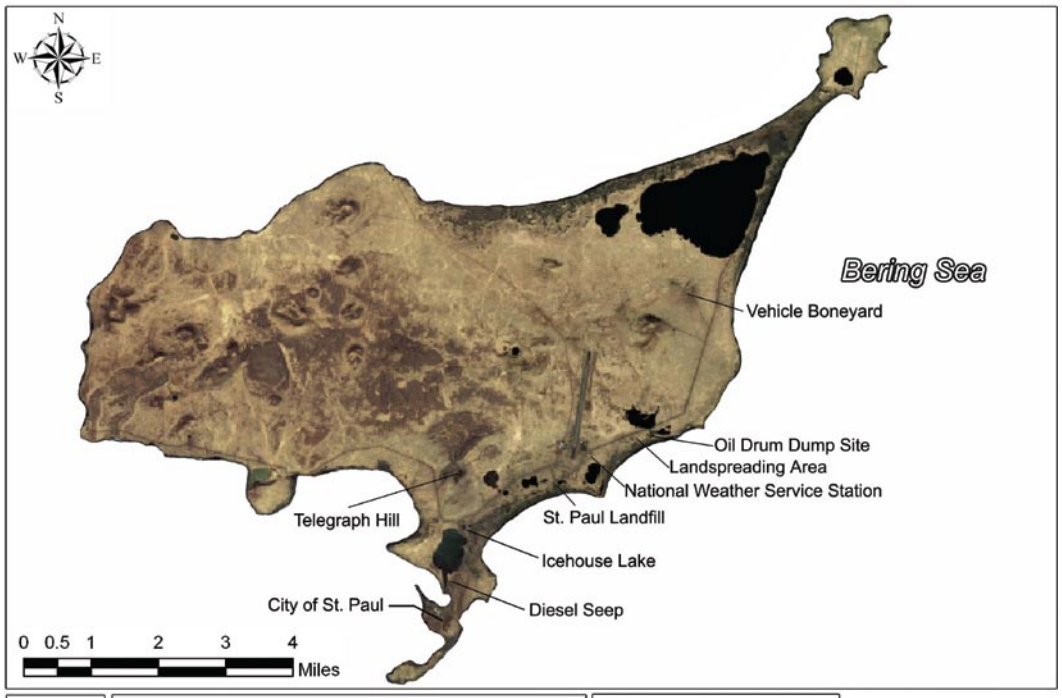


Figure 1-2	Groundwater Monitoring Sites St. Paul Long Term Monitoring Plan St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001	Pribilof Islands Restoration Project

Figure 2-1	Current Monitoring Network City of St. Paul St. Paul Island, Alaska	Sources: Well locations (NOAA GIS 2005), Tract 46 (BLM MTPs 1983), Aerial Photo (Aeromap US 1996).	Pribilof Islands Restoration Project

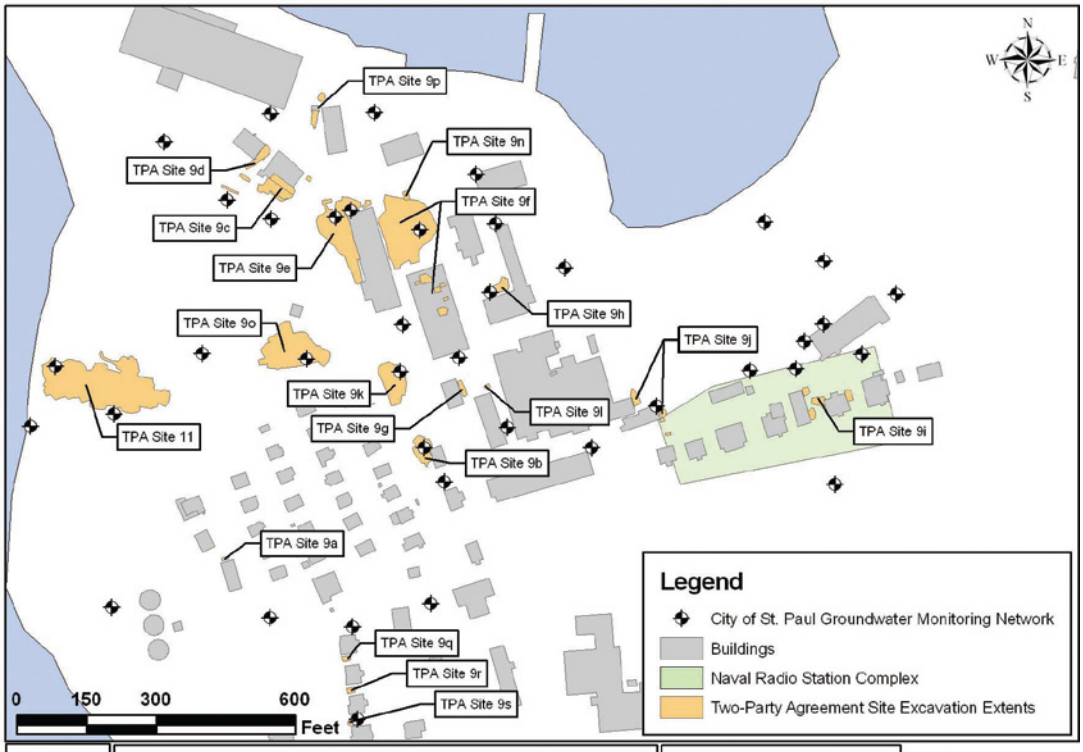


Figure 2-2	TPA Excavation Sites City of St. Paul St. Paul Island, Alaska	Sources: Well locations, Building Locations, and Excavation Extents (NOAA GIS 2005).	Pribilof Islands Restoration Project

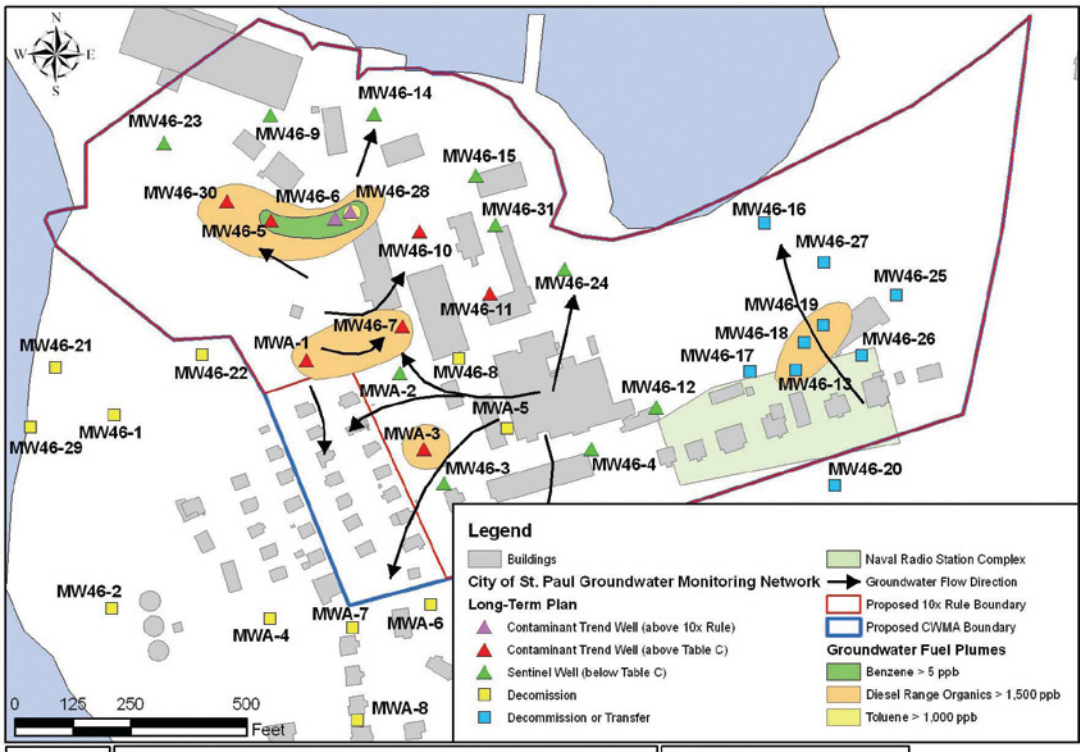


Figure 2-3	Groundwater Monitoring Network City of St. Paul St. Paul Island, Alaska	Sources: Well locations, Buildings, and Groundwater Boundaries (NOAA GIS 2005), Plume locations and Groundwater Flow (Mitretek 2005).

Pribilof Islands Restoration Project

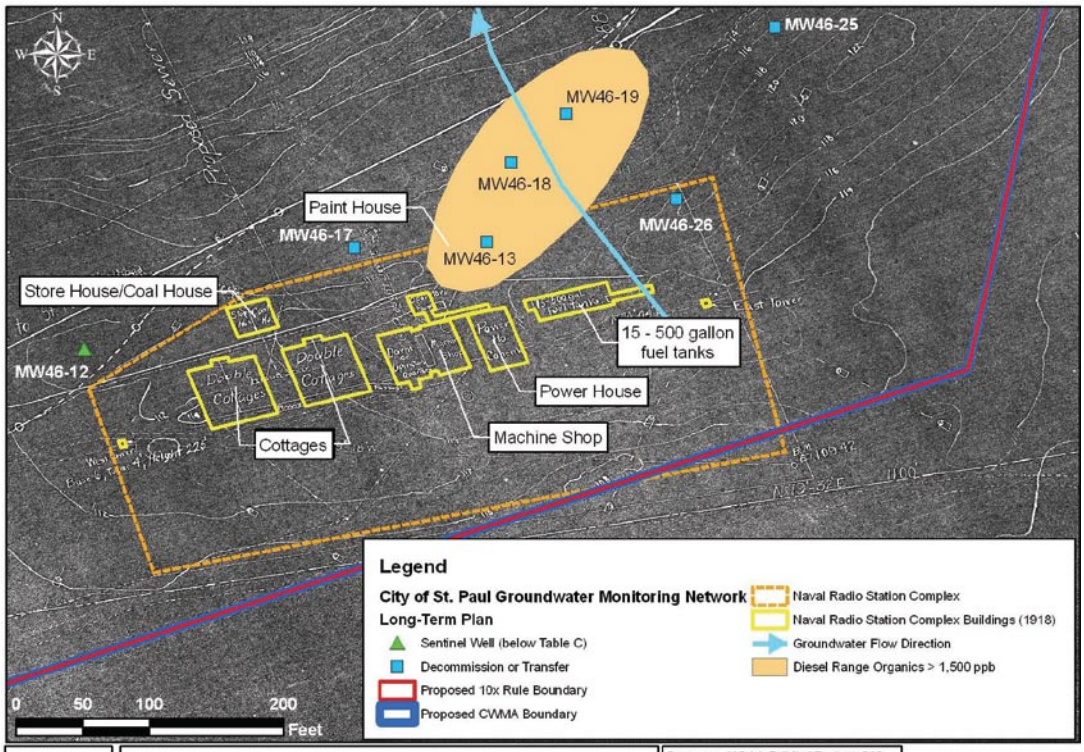


Figure 2-4	Groundwater Monitoring Network Naval Radio Station Complex St. Paul Island, Alaska	Sources: NOAA Pribilof Project GIS (2005), Groundwater Plume and Flow Direction (Mitretek 2005), Naval Radio Station Historical Map (A.C. Reynolds, 1918, based on 1917 surveys by William Hayne).

Pribilof Islands Restoration Project

Figure 2-5	Groundwater Monitoring Network Diesel Seep St. Paul Island, Alaska	Sources: Well Locations and Excavation Extent (NOAA GIS 2005), Satellite Imagery (Ikonos 2001).	Pribilof Islands Restoration Project

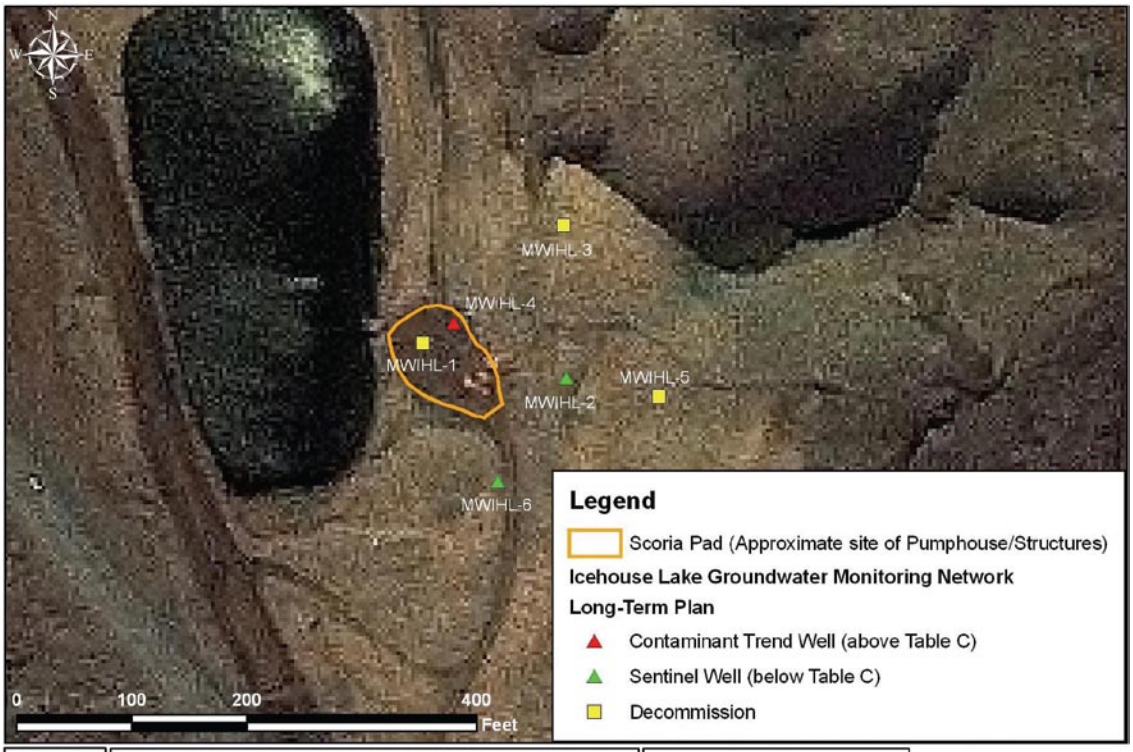


Figure 2-6	Groundwater Monitoring Network Icehouse Lake St. Paul Island, Alaska	Sources: Well Locations and Scoria Pad (NOAA GIS 2005), Satellite Imagery (Ikonos 2001).	Pribilof Islands Restoration Project

Figure 2-7	Groundwater Monitoring Network Lukanin Bay St. Paul Island, Alaska	Sources: Well Locations (NOAA GIS 2005), Satellite Imagery (Ikonos 2001).	Pribilof Islands Restoration Project

Figure 2-8	Groundwater Monitoring Network St. Paul Municipal Landfill St. Paul Island, Alaska	Sources: Well Locations and Tract 42 (NOAA GIS 2005), Satellite Imagery (Ikonos 2001).	Pribilof Islands Restoration Project

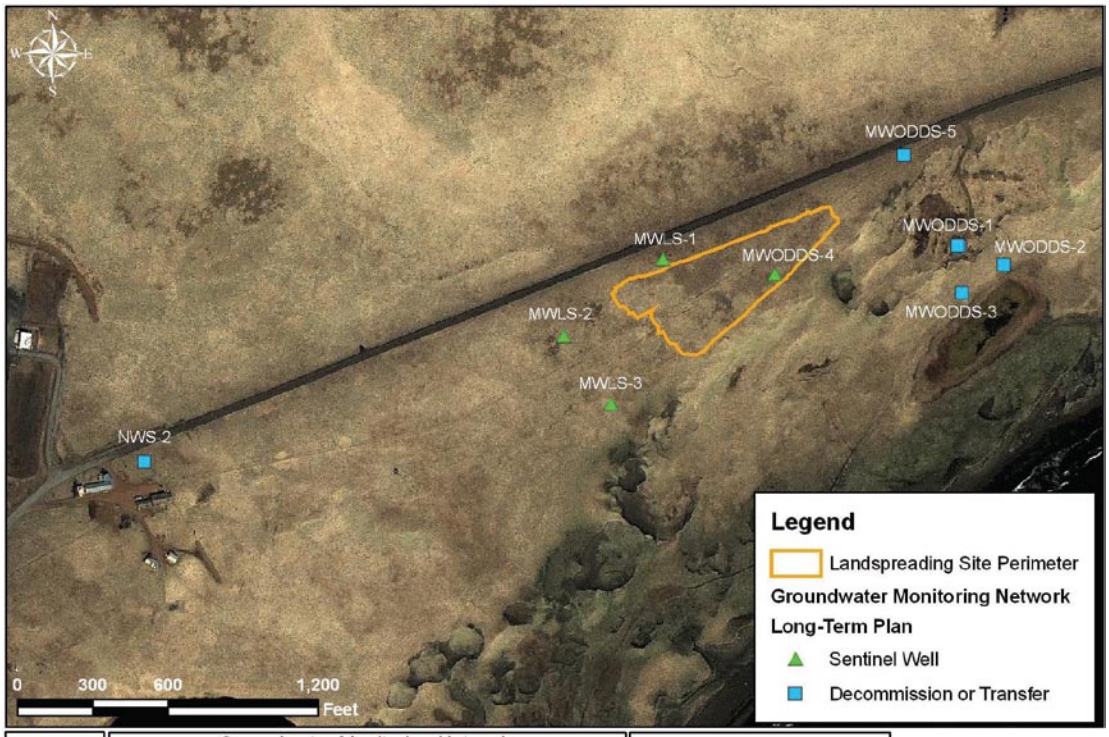


Figure 2-9	Groundwater Monitoring Network National Weather Service, Landspreading Area, and Oil Drum Dump Site St. Paul Island, Alaska	Sources: Well Locations (NOAA GIS 2005), Satellite Imagery (Ikonos 2001).	Pribilof Islands Restoration Project

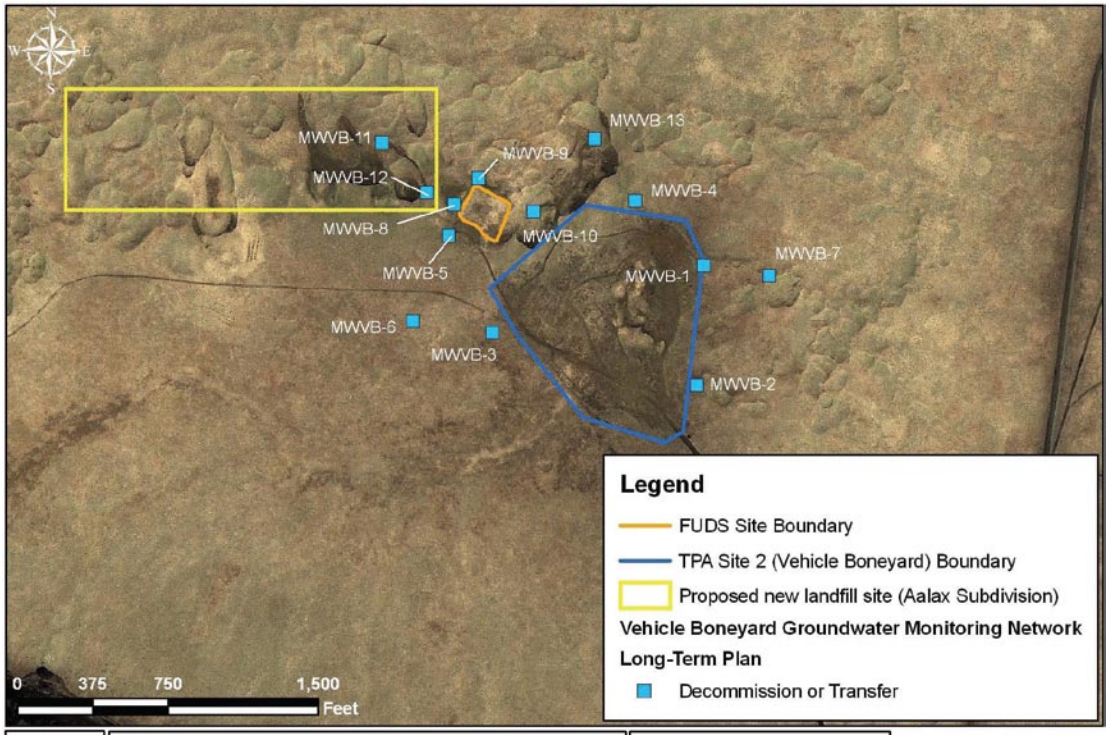


Figure 2-10	Groundwater Monitoring Network Vehicle Boneyard St. Paul Island, Alaska	Sources: Well Locations (NOAA GIS 2005), Satellite Imagery (Ikonos 2001).	Pribilof Islands Restoration Project

Figure 2-11	Groundwater Monitoring Network Telegraph Hill St. Paul Island, Alaska	Sources: Well Locations (NOAA GIS 2005), Satellite Imagery (Ikonos 2001).	Pribilof Islands Restoration Project

TABLES

TABLE 2-1. LONG-TERM PLANS FOR ST. PAUL MONITORING WELLS

St. Paul Island Monitoring Wells	Retain As Sentinel	Retain For Contaminant Trends	Decommission	Decom. or Transfer	Analytes	Monitoring Years/Freq.
City of St. Paul						
MW46-1			X		NA	
MW46-2			X		NA	
MW46-3	X				GRO, DRO, BTEX	5/Semi-Ann
MW46-4	X				GRO, DRO, BTEX	5/Semi-Ann
MW46-5		X			GRO, DRO, BTEX	5/Annual
MW46-6		X			GRO, DRO, BTEX	5/Annual
MW46-7		X			GRO, DRO, BTEX	5/Annual
MW46-8			X		NA	
MW46-9	X				GRO, DRO, BTEX	5/Semi-Ann
MW46-10		X			GRO, DRO, BTEX	5/Annual
MW46-11		X			GRO, DRO, BTEX	5/Annual
MW46-12	X				GRO, DRO, BTEX	5/Semi-Ann
MW46-13				X	NA	
MW46-14	X				GRO, DRO, BTEX	5/Semi-Ann
MW46-15	X				GRO, DRO, BTEX	5/Semi-Ann
MW46-16				X	NA	
MW46-17				X	NA	
MW46-18				X	NA	
MW46-19				X	NA	
MW46-20				X	NA	
MW46-21			X		NA	
MW46-22			X		NA	
MW46-23	X				GRO, DRO, BTEX	5/Semi-Ann
MW46-24	X				GRO, DRO, BTEX	5/Semi-Ann
MW46-25				X	NA	
MW46-26				X	NA	
MW46-27				X	NA	
MW46-28		X			GRO, DRO, BTEX	5/Annual
MW46-29			X		NA	
MW46-30		X			GRO, DRO, BTEX	5/Annual
MW46-31	X				GRO, DRO, BTEX	5/Semi-Ann
MWA-1		X			GRO, DRO, BTEX	5/Annual
MWA-2	X				GRO, DRO, BTEX	5/Semi-Ann
MWA-3		X			GRO, DRO, BTEX	5/Annual
MWA-4			X		NA	
MWA-5			X		NA	
MWA-6			X		NA	
MWA-7			X		NA	
MWA-8			X		NA	
Diesel Seep Site						
MWDS-1			X		NA	
MWDS-2		X			DRO	3/Annual
MWDS-3	X				DRO	3/Semi-Ann
MWDS-4			X		NA	
MWDS-5			X		NA	
Icehouse Lake						
MWIHL-1			X		NA	
MWIHL-2	X				GRO, DRO, Lead[1]	3/Semi-Ann
MWIHL-3			X		NA	
MWIHL-4		X			GRO, DRO, Lead[1]	3/Annual
MWIHL-5			X		NA	

St. Paul Island Monitoring Wells	Retain As Sentinel	Retain For Contaminant Trends	Decommission	Decom. or Transfer	Analytes	Monitoring Years/Freq.
MWIHL-6	X				GRO, DRO, Lead[1]	3/Semi-Ann
Lukanin Bay						
MWLB-1			X		NA	
MWLB-2			X		NA	
MWLB-3			X		NA	
St. Paul Landfill						
MWSNPLF-1		X			GRO, DRO, BTEX, Lead[1]	5/Annual
MWSNPLF-9		X			GRO, DRO, BTEX, Lead[1]	5/Annual
MWSNPLF-10		X			GRO, DRO, BTEX, Lead[1]	5/Annual
MWSNPLF-11		X			GRO, DRO, BTEX, Lead[1]	5/Annual
MWSNPLF-12		X			GRO, DRO, BTEX, Lead[1]	5/Annual
MWSNPLF-13		X			GRO, DRO, BTEX, Lead[1]	5/Annual
HC-4		X			GRO, DRO, BTEX, Lead[1]	5/Annual
HC-5		X			GRO, DRO, BTEX, Lead[1]	5/Annual
NWS LS/ODDS						
MWLS-1		X			GRO, DRO, BTEX	3/Annual
MWLS-2		X			GRO, DRO, BTEX	3/Annual
MWLS-3		X			GRO, DRO, BTEX	3/Annual
MWODDS-1				X	NA	
MWODDS-2				X	NA	
MWODDS-3				X	NA	
MWODDS-4		X			GRO, DRO, BTEX	3/Annual
MWODDS-5				X	NA	
Vehicle Boneyard						
MWVB-1				X	NA	
MWVB-2				X	NA	
MWVB-3				X	NA	
MWVB-4				X	NA	
MWVB-5				X	NA	
MWVB-6				X	NA	
MWVB-7				X	NA	
MWVB-8				X	NA	
MWVB-9				X	NA	
MWVB-10				X	NA	
MWVB-11				X	NA	
MWVB-12				X	NA	
MWVB-13				X	NA	
Telegraph Hill Scoria Pit						
MWTH-1				X	NA	
MWTH-2				X	NA	
MWTH-3				X	NA	
MWTH-4				X	NA	
MWTH-5				X	NA	

Note

1 – Lead samples to be analyzed/field filtered for total/dissolved lead
GRO - Gasoline Range Organics
DRO – Diesel Range Organics
BTEX – Benzene, Toluene, Ethylbenzene, Total Xylenes
NWS LS/ODDS – National Weather Service Landspread/Oil Drum Dump Site

TABLE 2-2. CITY OF ST. PAUL TPA SITE EXCAVATION QUANTITIES

TPA Site Number	Site Name	Total PCS Removal (cubic yards)
9a	Old Movie Theater	25
9b	Former Power Plant	420
9c	Decommissioned Power Plant	428
9d	Decommissioned Power Plant Annex	300
9e	Municipal Garage/Machine Shop	2,805
9f	Old Coal Shed (Cascade Building)	3,655
9g	Former Fouke Bunkhouse	155
9h	Former Alaska Dormitory	160
9i	Duplex Building and Former Electrical Shop	170
9j	Five Car Garage and Anderson Building	80
9k	AST Saddle Complex	1,370
9l	Old Sealing Plant/Barreling Shed	10
9m	Saltwater Wells	not excavated
9n	Gas Station and Garage	0
9o	Former Gasoline/Diesel Fuel Drum Storage	1,160
9p	West Dock Fuel Transfer Facility	250
9q	House 101	65
9r	House 102	50
9s	House 103	80
11	Former Diesel Tank Farm	6,550
Total		**17,733**

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269–7552
Fax: (907) 269–7649
http://www.dec.state.ak.us/

Database Reckey: 1989250115201
File No. 2644.38.027

August 8, 2005

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-6349

RE: Draft Long Term Monitoring Plan St. Paul Island Alaska June 30, 2005

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (ADEC) received the above document on July 7, 2005. The transmittal letter stated to withhold comments on the document until the August 2005 restoration advisory board meeting was held on St. Paul Island. The meeting has since been held. Upon review of the draft document, ADEC will approve the document as final and has no comments.

Please contact me with any questions or concerns at (907) 269-7552.

Sincerely,

Louis Howard
Project Manager
Federal Facilities

cc: Greg Gervais, NOAA WASC OR&R Pribilof Project

RECEIVED
AUG 1 0 2005

G:\SPAR\SPAR-CS\38 Case Files (Contaminated Sites)\2644 St. Paul Island\08-Aug-2005 LTM TPA 9 13 14 12 5 2 15A approved.doc

Printed on Recycled Pap

MEMORANDUM

State of Alaska

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINING LAND, AND WATER, WATER RESOURCES SECTION

TO: Michael L. Menge
Commissioner

DATE: April 5, 2006

THRU: Richard Mylius
Director

TELEPHONE NO.: 269-8645

FROM: Gary J. Prokosch
Chief, Water Resources Section

SUBJECT: CWMA St. Paul Island

Attached are a Commissioner's Order (to be signed) and a Record of Decision concerning the creation of a Critical Water Management Area (CWMA) with respect to the groundwater aquifer located under the town site of the City of St. Paul. This aquifer has been contaminated with hydrocarbons and is no longer suitable for use. NOAA in cooperation with ADEC requested that DNR establish the CWMA in order to facilitate the transfer of lands to private parties (native and regional corporations) and to put an end to the clean-up effort under ADEC's 10X rule. The CWMA restricts the use of water wells to obtain groundwater from this area. This restriction will assist in keeping the contaminated groundwater from moving from contaminated areas to less or uncontaminated areas inside or outside of the CWMA boundaries.

The record of decision was written after fulfilling the requirements of AS 11 AAC 93.500 through 11 AAC 93. 530. The decision was based on public meets, public notice, and a hearing held at St. Paul. No comments or objections of the proposed CWMA were received during this process. Robert Nauheim, Assistant Attorney General has reviewed the Decision of Record.

Also attached is a Public Notice, announcing the Commissioner's decision, that is required to be published in a newspaper of general circulation in the affected area once a week for four consecutive weeks.

MEMORANDUM

Dept. of Natural Resources

State of Alaska

Office of the Commissioner

TO: Department Order files,
and the Aleutian Island Recorders Office

DATE: April 5, 2006

TELEPHONE NO: 269-8431
FAX NO: 269-8918

From: Michael L. Menge
Commissioner

SUBJECT: Department Order #

The Department of Natural Resources hereby determines that the area generally described as the town site of the City of St. Paul is a Critical Water Management Area (CWMA) with respect to the groundwater aquifer. The CWMA is located within Section 25, Township 35 South, Range 132 West, Seward Meridian. The boundary and properties involved are shown on Attachment "A" and made part hereof. As a result of a hydrologic study of the aquifer conducted over the past 3 years, it has been established that the quality of the groundwater in the area is deteriorating due to contamination by hydrocarbons. The construction of water wells within the boundary of the CWMA, and the associated pumping of water from these wells will cause this contamination to spread to non-contaminated sites or sites that are now less contaminated, and may become a threat to the public interest. The Decision of Record, on Attachment "B" and made part hereof, further describes the reasons for this CWMA designation.

Pursuant to AS 46.15.520 and 11 AAC 93, Michael L. Menge, Commissioner of the Department of Natural Resources, hereby designates the area depicted in Attachment "A" as a Critical Water Management Area with respect to the groundwater aquifer. This Department Order:

A. Applies only to the groundwater aquifer within this specific area.

B. Prohibits the acceptance of new water right applications and the establishment of new water wells after May 26, 2005, until such time as the designation of the CWMA is vacated by the Department.

C. Establishes that the use of any amount of groundwater from this designated area without a valid permit or certificate of appropriation is a significant amount of water and is no longer exempt under 11 AAC 93.920.

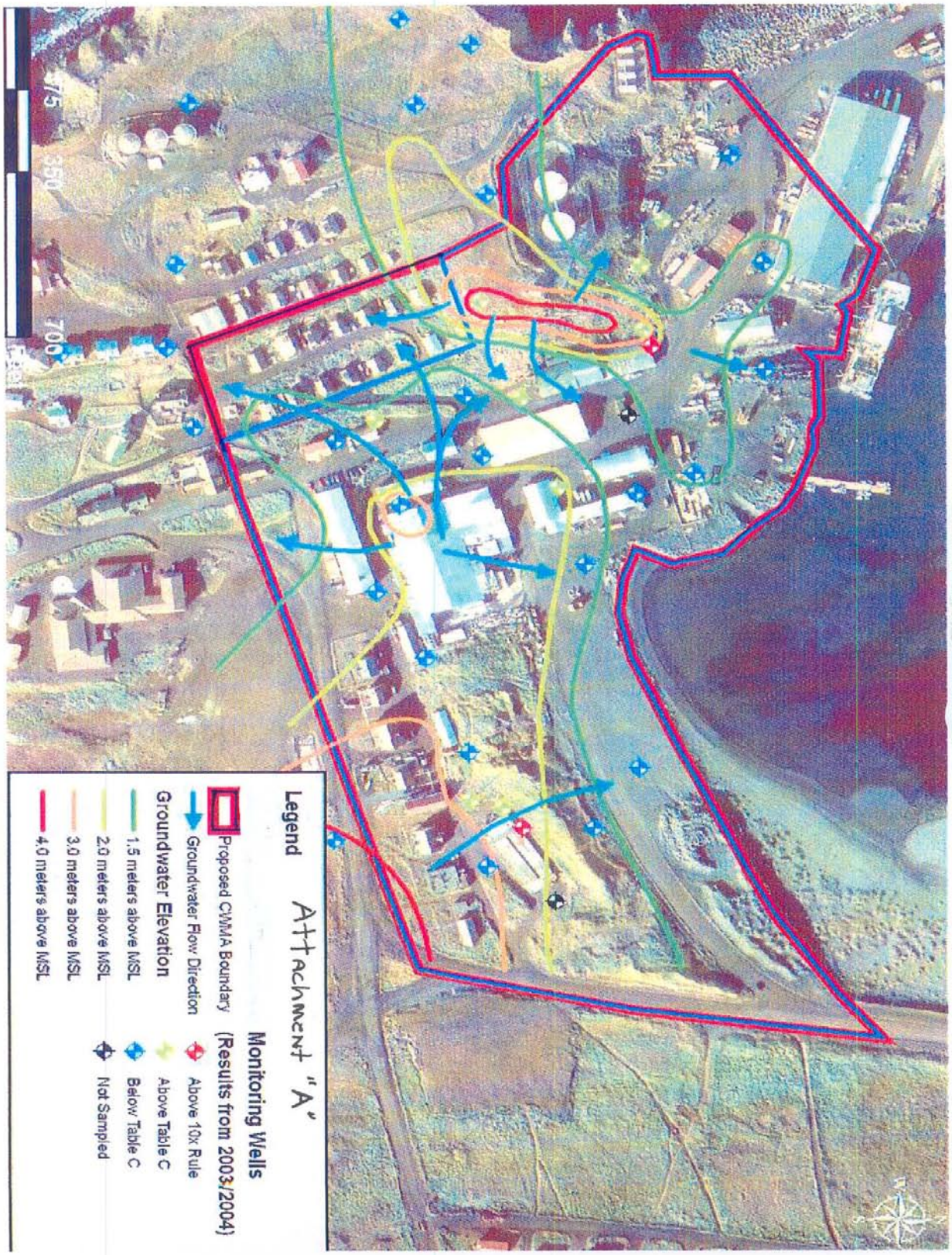
D. Notifies anyone using groundwater within this designated area without a valid permit or certificate of appropriation, that they shall be prosecuted under AS 46.15.180 and immediately served with a cease and desist order pursuant to 11 AAC 93.290 (a) (4). If necessary to prevent further violation, a court order will be obtained pursuant to 11 AAC 93.290 authorizing seizure or removal of structures or works of appropriation.

E. Allows the Department to establish additional conditions on diversions, withdrawals or use of groundwater to insure against the further deterioration of this public water resource.

4/10/06

Michael L. Mange
Commissioner, Department of Natural Resources

Date


Attachment "A"
Legend
Proposed CVMMA Boundary
Groundwater Flow Direction
Groundwater Elevation
1.5 meters above MSL
2.0 meters above MSL
3.0 meters above MSL
4.0 meters above MSL
Monitoring Wells
(Results from 2003/2004)
Above 10x Rule
Above Table C
Below Table C
Not Sampled
75
150
300

Alaska Department of Natural Resources
Division of Mining Land and Water
Water Resources Section
550 W. 7th Avenue, Suite 1020
Anchorage, Alaska 99501

CRITICAL WATER MANAGEMENT AREA
CITY OF SAINT PAUL

RECORD OF DECISION
Attachment "B"

BACKGROUND: On January 23, 2004 the National Oceanic and Atmospheric Administration (NOAA) requested that the Department of Natural Resources (DNR) establish a critical water management (CWMA) under 11 AAC 93.500. The CWMA would cover only the groundwater aquifer under a portion of the town site of the City of St. Paul. In cooperation with the Department of Environmental Conservation (DEC), NOAA has conducted extensive studies of the area groundwater and found significant petroleum contamination making the water unsuitable as drinking water or for other beneficial uses. The creation of the CWMA will facilitate the transfer of lands from the federal government to private parties on the island. DEC consulted with the public and agreed with NOAA that a non-drinking water, groundwater use determination is appropriate for this area. This determination allows for an adjustment to the groundwater cleanup levels. The CWMA is necessary to establish institutional controls to limit inadvertent future use of the contaminated groundwater in order to protect public health, and the environment.

PROCEDURES: In accordance with 11 AAC 93.500 – 11 AAC 93.530 have been followed in order to establish a CWMA.

In preparation for the designation, and in cooperation with DEC and NOAA, a public meeting was held in St. Paul on June 18, 2004. This meeting invited anyone interested in learning about what a CWMA is and how it might affect an individual. Seventeen individuals attended this meeting.

11 AAC 93.500. Initiating Designation Proceedings

The commissioner will, in his or her discretion, initiate proceedings to designate a particular geographic or hydrologic area, including surface and ground water, as a critical water management area if

(1) the commissioner determines that there is or might be an imminent water shortage in the area, for all or part of the year, affecting a substantial number of permittees or certificate holders of record so that their ability to reasonably acquire water has been or will be affected by existing or potential over appropriation, drought, saltwater intrusion, or a chemical or toxic contamination rendering the water source unusable;

Extensive water quality and hydrologic studies were conducted for NOAA that clearly show the area under the town site is highly contaminated with petroleum making the water unsuitable as drinking

water or for other beneficial uses. The placement of and use of water wells in this area has the potential of causing the contaminated water to move from sites with heavy contamination to areas that are not as contaminated or uncontaminated areas. The only prior appropriator of record near the CWMA is the City of St. Paul who obtains water from a well field that is not hydrologiclly connected to the contaminated groundwater within this CWMA. The City of St. Paul's water right will not be unduly affected by this CWMA designation. The water from the City of St. Paul's well field does serve the CWMA area through a buried distribution system. The water distribution system is located where contaminated soils exist and areas not currently contaminated. The establishment of the CWMA will protect the public water distribution system by controlling the movement of contamination water within the CWMA from moving to areas where the distribution line currently exist or may be expanded to in the future. The movement of contaminated water, by pumping of water from wells in the area, to other areas where little or no contamination exists will affect the ability of that water to be used now and in the future.

(2) an agency or political subdivision of the state, or an agency of the United States, petitions for the designation of the area as a critical water management area and demonstrates that a condition in (1) of this section exists; or
NOAA is an agency of the United States.

11 AAC 93.510. Public Notice and Hearing

Before the commissioner designates a geographic or hydrologic area as a critical water management area, or revokes or amends a designation, the department will

(1) publish a notice of the proposed designation, revocation, or amendment in a newspaper of general circulation in the area affected once a week for four consecutive weeks, soliciting public comment and announcing the date, time, and place of a public hearing;
Public notice addressing the proposed designation of the CWMA and announcing a public hearing were published on April 8, April 14, April 21, and April 28, 2005 in newspapers of general circulation.

(2) solicit comments on the proposed designation, revocation, or amendment by certified mail, return receipt requested, from appropriators and property owners of record within the area; affected federal, state, and local agencies, including the Departments of Fish and Game and Environmental Conservation; and any affected regional or village corporation; and
On April 8, 2005 a public notice and maps of the proposed CWMA was mailed to every post office box (149) in the City of St. Paul. This included all landowners in the area of the CWMA and all other residents in St Paul. In addition the public notice and map were posted at the St. Paul Post Office, and the City of St. Paul office. Public Notice was also posted on the DNR web site from April 11, 2005 through May 23, 2005. Notice was sent to the Departments of Fish and Game and Environmental Conservation; and any affected regional or village corporation.

(3) hold a public hearing in the affected area to take written and oral comments on the proposed designation, revocation, or amendment; the department will accept additional written comments submitted up to 30 days after the hearing date.
A public hearing was held at the St. Paul Island School in the Video Conference Room from 9:00 AM through Noon. Eleven individuals signed in, a short presentation on the proposed CWMA was given. The opportunity to testify was opened at 9:30 AM; no one took advantage of this opportunity. The hearing ended at Noon.

PUBLIC INTEREST DETERMINATION:

To determine if the proposed CWMA is in the public interest the criteria set out in

AS 46.15.080(b). Criteria For Issuance of Permit, will be used as stated in 11AAC 93.520 with the understanding that these criteria are set up to evaluate the appropriation and use of water and that the establishment of a CWMA will preclude the construction of water wells and the use of groundwater within the boundary of the CWMA.

AS 46.15.080(B) In determining the public interest, the commissioner shall consider

(1) the benefit to the applicant resulting from the proposed appropriation;
The applicant in this case is NOAA who requested the designation in order to receive permission from DEC in the establishment of the 10X rule for contamination clean up. The CWMA establishes an institutional control over the removal of groundwater from the contaminated area, which is required under the 10X rule. This is a benefit to the applicant in that a more intensive and expensive clean up would not be required. It should be noted that the additional clean-up effort would not result in a significant difference in contamination levels in this area.

(2) the effect of the economic activity resulting from the proposed appropriation;
There is not expected to be any increase or decrease in economic activity as a result of the establishment of this CWMA. The establishment of the CWMA will facilitate the transfer of lands from the federal government to the native corporation. Land use due to the establishment of this CWMA is not expected to be different from the current pattern or established uses. Public water serves the CWMA and there is not apparent need to drill a well or use the groundwater within the boundaries of the CWMA.

(3) the effect on fish and game resources and on public recreational opportunities;
The establishment of the CWMA will not effect any fish and game resources or hinder in anyway public recreational activities. The CWMA simply prohibits the development, diversion, and use of groundwater located within the boundaries of the CWMA.

(4) the effect on public health;
The establishment of the CWMA prohibits the development, diversion and use of groundwater located within the boundaries of the CWMA. In cooperation with the Department of Environmental Conservation, NOAA has conducted extensive studies of the area groundwater and found significant petroleum contamination making the water unsuitable as drinking water or for other beneficial uses. Restricting access to this water now and into the future is a health benefit. The City of St. Paul provides an abundant and clean source of water to the homes and businesses within the boundary of the CWMA.

(5) the effect of loss of alternate uses of water that might be made within a reasonable time if not precluded or hindered by the proposed appropriation;
Once established, the CWMA will preclude the use of groundwater from the aquifer within the boundary of the CWMA. The City of St. Paul provides an abundant and clean source of water to the homes and businesses within this area. The monitoring of the water quality in the CWMA will continue into the future, when and if the water quality improves to the point where it can be used, the designated CWMA can be revoked or amended to allow for full or limited use.

(6) harm to other persons resulting from the proposed appropriation;
The extensive public notice and hearing process required to establish a CWMA resulted in no adverse comments to DNR's designating the proposed area a CWMA. The establishment of the CWMA will keep current and future landowners within the CWMA from drilling, digging a well or otherwise removing groundwater from the CWMA.

(7) the intent and ability of the applicant to complete the appropriation; and

NOAA has the intent and ability to meet the requirements required by DEC to establish a 10X rule for contamination clean up in the area of the CWMA . The CWMA establishes an institutional control over the removal of groundwater from the contaminated area, which is required under the 10X rule. This is a benefit to the applicant in that a more intensive and expensive clean up would not be required. The applicant has no need to remove water other than for water quality testing from a series of monitoring wells.

(8) the effect upon access to navigable or public water.
The establishment of the CWMA will in no way effect the ability of the public to access navigable or public waters.

FINDING OF FACTS: As a result of the water quality and hydrologic studies of the aquifer with the boundary of the CWMA conducted over the past 3 years, it has been established that the quality of the groundwater in the area is contamination by hydrocarbons. Water well construction, and use of water will likely contribute to the spread of contamination to areas within the CWMA that are not currently contaminated or sites that are now less contaminated. The movement of contamination by pumping water from wells may become a threat to the public interest as described above. The requirements in accordance with 11 AAC 93.500 – 11 AAC 93.530 have been followed in order to establish a CWMA.

DECISION: The Department of Natural Resources hereby determines that the area generally described as the town site of the City of St. Paul is a Critical Water Management Area (CWMA) area with respect to the groundwater aquifer. The boundaries of the CWMA and the properties involved are described on Attachment "A" attached hereto and made part hereof. Pursuant to AS 46.15.520 and 11 AAC 93, Michael L. Menge, Commissioner of the Department of Natural Resources, should designate the area depicted in Attachment "A" as a Critical Water Management Area with respect to the groundwater aquifer. This Department Order:

1. Applies only to the groundwater aquifer within this specific area.

2. Prohibits the acceptance of new water right applications and the establishment of new water wells after May 26, 2005, until such time as the Department vacates the designation of the CWMA.

3. Establishes that the use of any amount of groundwater from this designated area without a valid permit or certificate of appropriation is a significant amount of water and is no longer exempt under 11 AAC 93.920.

4. Notifies anyone using groundwater within this designated area without a valid permit or certificate of appropriation, that they shall be prosecuted under AS 46.15.180 and immediately served with a cease and desist order pursuant to 11 AAC 93.290 (a) (4). If necessary to prevent further violation, a court order will be obtained pursuant to 11 AAC 93.290 authorizing seizure or removal of structures or works of appropriation.

Gary J. Prokosch — March 14, 2006

Gary J. Prokosch, Chief, Water Resources Section — DATE

Residual Soil Contamination Report
St. Paul Island, Alaska

May 28, 2008

National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE
Seattle, Washington 98115

Table of Contents

Executive Summary 1541
I. Introduction 1541
II. Applicable Cleanup Levels 1542
III. Summary of Residual Contamination at NOAA-Remediated Sites 1543
Oil Drum Dump, Site 1; TPA Site 1 (Figure 4) 1543
Vehicle Boneyard, Site 2; TPA Site 2 (Figure 5) 1544
Little Polovina Boneyard, Site 3; TPA Site 3 (Figure 2) 1544
Dune Vehicle Boneyard, Site 4; TPA Site 4 (Figure 2) 1544
St. Paul Landfill Cell C, Site 5; TPA Site 5a (Figure 6) 1544
St. Paul Landfill Cell A, Site 6; TPA Site 5b (Figure 7) 1544
St. Paul Landfill Cell B Drum Dump, Site 7; TPA Site 5c (Figure 8) 1545
St. Paul Landfill Cell B Solid Waste, Site 8; TPA Site 5d (Figure 2) 1545
Pumphouse Lake, Site 9; TPA Site 6 (Figure 2) 1545
NMFS Fuel Barge: North End Lagoon, Site 10; TPA Site 7a (Figure 2) 1545
NMFS Fuel Barge: Lagoon Channel, Site 11; TPA Site 7b (Figure 3) 1545
NMFS Fuel Barge: Black Bluff, Site 12; TPA Site 7c (Figure 3) 1546
NMFS Fuel Barge: East Landing, Site 13; TPA Site 7d (Figure 3) 1546
NOAA Landfills, Sites 14 and 15; TPA Site 8 (Figure 3) 1546
Old Movie Theater, Site 16; TPA Site 9a (Figure 3) 1546
Former Power Plant (Former Post Office), Site 17; TPA Site 9b (Figure 9) 1546
Decommissioned Power Plant, Site 18 - TPA Site 9c (Figure 10) 1547
Decommissioned Power Plant Annex, Site 19; TPA Site 9d (Figure 11) 1547
Machine Shop/Municipal Garage, Site 20; TPA Site 9e (Figures 12a-e) 1547
Old Coal Shed (Cascade Building), Site 21; TPA Site 9f (Figures 13a-f) 1548
Former Fouke Bunkhouse, Site 22; TPA Site 9g (Figure 3) 1548
Former Alaska Dormitory, Site 23; TPA Site 9h (Figure 14) 1548
E-Shop/Radio Building and Duplex, Site 24; TPA Site 9i (Figure 15) 1548
Five Car Garage and Anderson Building, Site 25; TPA Site 9j (Figure 3) 1549
AST Saddle Complex, Site 26; TPA Site 9k (Figure 16) 1549
Old Sealing Plant (a.k.a. Barreling Shed), Site 27; TPA Site 9ℓ (Figure 3) 1550
Salt Water Wells, Site 28; TPA Site 9m (Figure 3) 1550
Former Gasoline Tank Farm, Site 29; TPA Site 10 (Figure 3) 1550
Diesel Tank Farm, Site 30; TPA Site 11 (Figure 17) 1550
Lukanin Bay, Sites 31, 32, and 33; TPA Site 12 a, b, and c (Figure 2) 1550
Salt Lagoon Diesel Seep, Sites 34 and 35; TPA Sites 13a and 13b (Figure 18) 1550
Icehouse Lake, Site 36; TPA Site 14 (Figure 2) 1551
Telegraph Hill Scoria Pit, Site 37; TPA Site 15a (Figure 19) 1551
Lake Hill Scoria Pit, Site 38; TPA Site15b (Figure 2) 1551
Ridge Wall Scoria Pit, Site 39; TPA Site 15c (Figure 2) 1552

Aleut Bunkhouse, Site 40; NTPA (Figure 2) 1552
Bulldozer in Bog, Site 41; NTPA (Figure 2) 1552
Explosives Storage Bunker, Site 42; NTPA (Figure 3) 1552
Barrels at North End of Salt Lagoon, Site 43; NTPA (Figure 2) 1552
Big Polovina Debris, Site 44; NTPA (Figure 2) 1552
Southwest Point Former LORAN, Site 45; NTPA (Figure 2) 1552
Blubber Dump Debris, Site 46; NTPA (Figure 2) 1552
Petroleum Contaminated Stockpile (Blubber Dump Enhanced Thermal Conduction Soil Treatment Facility and Polovina Hill Stockpile), Site 47; NTPA (Figure 2) 1553
Windmill Wells, Site 48; NTPA (Figure 3) 1553
Gas Station and Garage, Site 49; TPA Site 9n (Figure 3) 1553
Former Gasoline/Diesel Drum Storage, Site 50; TPA Site 9o 1553
West Dock Fuel Transfer Facility (Receiving Warehouse), Site 51; TPA Site 9p (Figure 21) 1553
Tract 50 Asbestos in Soil, Site 52; NTPA (Figure 3) 1554
Tract A Lot 101, Site 53; TPA Site 9q (Figure 22) 1554
Tract A Lot 102, Site 54; TPA Site 9r (Figure 23) 1554
Tract A Lot 103, Site 55; TPA Site 9s (Figure 3) 1554
ATCO/Radio Building Barrel Staging Area, Site 56; NTPA (Figure 24) 1554
Tract 46 Sheet Metal Garage, Site 57; NTPA (Figure 3) 1555
Tract 50 Drum Platform Foundation and Combine Shop UST, Site 58; NTPA (Figures 3 and 25) 1555
Big Polovina Debris Stockpile Soil, Site 59; non-TPA (Figure 2) 1555
Lead Contaminated Soils, Site 60; non-TPA (Figure 26) 1555
IV. Summary 1556
V. References 1556

List of Tables

Table 1. Method One Table A1 Cleanup Levels for Petroleum-Contaminated Soil
Table 2. Method Two Tables B1 and B2, Ten Times Rule Alternative Cleanup Levels for Select Petroleum Contaminants and Lead, and 1991 Cleanup Level (Benzene only) in Soil
Table 3. Summary of Residual Soil Contamination and Buried Debris at NOAA Cleanup Sites on St. Paul Island, Alaska

List of Figures

Figure 1 St. Paul Island Vicinity Map
Figure 2 St. Paul Island Site Locations
Figure 3 City of St. Paul Site Locations
Figure 4 Residual Contamination, Oil Drum Dump, Site 1/TPA Site 1
Figure 5 Residual Contamination, Vehicle Boneyard, Site 2/TPA Site 2
Figure 6 Residual Contamination, Little Polovina Vehicle Boneyard, Site 3/TPA Site 3
Figure 7 Residual Contamination, Dune Vehicle Boneyard, Site 4/TPA Site 4
Figure 8 Residual Contamination, St. Paul Landfill Cell C, Site 5/TPA Site 5a
Figure 9 Residual Contamination, St. Paul Landfill Cell A, Site 6/TPA Site 5b
Figure 10a Long-Term Groundwater Monitoring, St. Paul Landfill Cell B Drum Dump, Site 7/TPA Site 5c
Figure 10b Residual Contamination, St. Paul Landfill Cell B, Site 7/TPA Site 5c
Figure 11 Residual Contamination, Pumphouse Lake, Site 9/TPA Site 6
Figure 12 Residual Contamination, NMFS Landfill & NOAA Village Hill Landfill, Sites 14 & 15 /TPA 8a & 8b
Figure 13 Residual Contamination, Former Power Plant, Site 17/TPA Site 9b
Figure 14 Residual Contamination, Decommissioned Power Plant & Decommissioned Power Plant Annex, Sites 18 & 19/TPA Sites 9c & 9d
Figure 15 Residual Contamination, Municipal Garage Demolition, Site 20/TPA Site 9e
Figure 16a Residual Contamination - DRO, Cascade Building, Site 21/TPA Site 9f
Figure 16b Residual Contamination - GRO, Cascade Building, Site 21/TPA Site 9f
Figure 16c Residual Contamination - Benzene, Cascade Building, Site 21/TPA Site 9f
Figure 16d Residual Contamination - Toluene, Cascade Building, Site 21/TPA Site 9f
Figure 16e Residual Contamination - Ethylbenzene, Cascade Building, Site 21/TPA Site 9f
Figure 17 Residual Contamination, Former Fouke Bunkhouse, Site 22/TPA Site 9g
Figure 18 Residual Contamination, Former Alaska Dormitory, Site 23/TPA Site 9h
Figure 19 Residual Contamination, E-Shop/Radio Building and Duplex, Site 24/TPA Site 9i
Figure 20 Residual Contamination, Five Car Garage & Anderson Building, Site 25/TPA Site 9j
Figure 21 Residual Contamination, AST Saddle Complex, Site 26/TPA Site 9k
Figure 22 Residual Contamination, Salt Water Wells, Site 28/TPA Site 9m
Figure 23 Residual Contamination, Former Diesel Tank Farm, Site 30/TPA Site 11
Figure 24 Residual Contamination, Lukanin Bay, Sites 31, 32, & 33/TPA Sites 12a, 12b, & 12c
Figure 25 Residual Contamination, Salt Lagoon Diesel Seep, Sites 34 & 35/TPA Sites 13a & 13b
Figure 26 Residual Contamination, Icehouse Lake, Site 36/TPA Site 14
Figure 27 Residual Contamination, Telegraph Hill, Site 37/TPA Site 15a
Figure 28 Residual Contamination, Blubber Dump Debris, NTPA Site 46
Figure 29 Residual Contamination, Former Gasoline/Diesel Drum Storage Area, Site 50/TPA Site 9o
Figure 30 Residual Contamination, West Dock Fuel Transfer Facility, Site 51/TPA Site 9p
Figure 31 Residual Contamination, Teacher Housing, House 101 UST, Site 53/TPA Site 9q
Figure 32 Residual Contamination, Teacher Housing, House 102 UST, Site 54/TPA Site 9r
Figure 33 Residual Contamination, Teacher Housing, House 103 UST, Site 55/TPA Site 9s
Figure 34 Residual Contamination, ATCO/Radio Building Barrel Staging Area, NTPA Site 56
Figure 35 Residual Contamination, Tract 50 Drum Platform Foundation, NTPA Site 58

Executive Summary

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) Pribilof Project Office is responsible for site characterization and restoration on St. Paul Island, Alaska. Although NOAA has attempted to meet State of Alaska soil cleanup levels and has removed contaminated soil to the maximum extent practicable, residual contamination remains at some St. Paul Island sites. This report documents the nature of known residual soil contamination at NOAA-remediated sites and presents the rationale for leaving the contamination in place.

Of the 60 sites investigated and/or restored respecting soils by NOAA at St. Paul Island:

- DRO remains above applicable site cleanup levels at 19 sites.
- GRO remains above applicable site cleanup levels at 3 sites.
- RRO remains above applicable site cleanup levels at 3 sites.
- Benzene remains above applicable site cleanup levels at 3 sites.
- Toluene remains above applicable site cleanup levels at 2 sites.
- Ethylbenzene remains above applicable site cleanup levels at 2 sites.
- Total xylenes remain above applicable site cleanup levels at 2 sites.
- Lead remains above applicable site cleanup levels at 3 sites.

Contaminated soil may have been left in place at sites due to equipment limitations and/or the presence of utility lines, buildings, roads, and other structures. Additionally, NOAA was not obligated to excavate contaminated soil to address the inhalation and ingestion pathways fifteen feet or greater below the ground surface, or at shallower depths when encountering the groundwater table. In areas influenced by the tides, contamination sometimes became located within a smear zone, where the rise and fall of the water table influenced the vertical distribution of the contamination within the soil matrix

Buried debris, such as asbestos-containing material and municipal solid waste, also remain at six sites. In all but one location, NOAA placed a soil cap over the waste consistent with State of Alaska requirements. The location where NOAA did not place a soil cap was at the Village Landfill which exists on a near vertical slope approximately fifty feet high.

During 2006, NOAA initiated a long-term groundwater monitoring plan at St. Paul Island to monitor the migration and attenuation of groundwater contamination and to gauge the effectiveness of remedial actions. This report is not intended to address groundwater.

I. Introduction

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) Pribilof Project Office is responsible for site characterization and restoration at St. Paul Island, Alaska (Figure 1). Public Law 104-91 of 1996 and Public Law 106-562 of 2000 provided the mandate for these activities. A Two Party Agreement (TPA), signed in 1996 by NOAA and the State of Alaska, provided the framework for corrective actions at St. Paul Island (NOAA 1996). The State of Alaska provides TPA oversight through the Alaska Department of Environmental Conservation (ADEC).

This report documents known residual soil contamination, and buried solid wastes left in place at NOAA-remediated sites on St. Paul Island (Figure 1). Contaminated soil is soil containing a concentration of a hazardous substance (as defined in AS 46.03.826) that exceeds its applicable cleanup level (discussed below). Residual soil contamination may remain at a site after remediation for several reasons. ADEC required NOAA to achieve soil cleanup levels to the maximum extent practicable (18 AAC 75.325(f), 18 AAC 75.990). As such, in some cases contaminated soil was left in place to preserve the integrity of utility lines, buildings, and roads. In other cases, the heavy equipment available on island was inadequate to continue excavation, and it was not cost-effective to mobilize additional equipment to the island given the low risk threat posed by the contamination. Additionally,

ADEC uses fifteen (15) feet below ground surface (bgs) to define subsurface soil to which residents will have a reasonable potential exposure through the inhalation or ingestion pathways (ADEC 2000; 18 Alaska Administrative Code 75.340 (j)(2)). Therefore NOAA was not obligated to excavate contaminated soil occurring at depths at 15 feet bgs or greater to address the inhalation and ingestion pathways. Excavation within the water table is considered impractical and not required by ADEC regulations. The extent of the soil matrix contamination within the water table is not addressed within this report.

The TPA listed fifteen (15) sites (Figure 2). During remedial investigation and/or restoration NOAA encountered numerous instances when either one or more TPA listed sites contained areas with non-contiguous contamination and solid wastes, or an unknown site was revealed following sampling. Such discoveries frequently precluded action without the preparation of either additional investigations or plans, which caused modification to various activity and budget tracking schedules. Further, each new site would require modification to the TPA. NOAA proposed to ADEC to treat each of these newly discovered sites consistent with the TPA, without expressly adding the new sites to the TPA by formal modification. ADEC accepted this approach, and these new sites were coined "non-TPA sites." Under this approach the number of sites rose from 15 to sixty (60), which accounts for the tandem numbering system, or the TPA and NOAA Sites list. The greatest concentration of sites is at the St. Paul village area (Figure 3). The reader will note that groundwater was not included in the site list, although investigation and corrective action was undertaken when appropriate.

For each site remediated by NOAA at St. Paul Island, including non-TPA sites, this report specifies where soil contamination was knowingly left in place. Where residual soil contamination exists, NOAA provided a description of the nature of the contamination and an explanation of why the contamination remains. NOAA has applied the same rationale and standards for decisions pertaining to TPA and non-TPA sites. Figures 2 and 3 identify the locations of sites restored by NOAA.

This report does not address groundwater contamination. Please refer to NOAA's Final Long-term Groundwater Monitoring Plan for information related to groundwater contamination and long-term monitoring (NOAA 2005a). Groundwater monitoring will serve to gauge the effectiveness of remedial actions and to monitor the migration of residual soil contamination into the groundwater table.

II. Applicable Cleanup Levels

The TPA allows NOAA to apply soil cleanup levels using the methods described in the 1991 non-underground storage tank regulations (ADEC 1991); however, with ADEC concurrence, NOAA has elected to use the more stringent current regulations (ADEC 2000) to address soil cleanup whenever possible. Four different methods are available to determine soil cleanup levels at petroleum-contaminated sites in accordance with the current State of Alaska Oil and Hazardous Substances Pollution Control regulations (18 Alaska Administrative Code (AAC) 75). Method One involves the use of Table A1 of 18 AAC 75.341(a) to calculate a cleanup level and can only be applied to sites where the groundwater does not contain hazardous substances associated with the site (Table 1). Method Two, discussed at 18 AAC 75.341(c), employs two separate tables including one for individual contaminants and one for petroleum hydrocarbon contaminants (Table 2). Method Three, discussed at 18 AAC 75.340(e), allows substitution of site-specific data for selected default parameters used in the Method Two equations. Method Four, discussed at 18 AAC 75.340(f), requires the development and subsequent ADEC approval of a site specific risk assessment (ADEC 2006).

For non-petroleum contamination, the TPA allows the use of the latest Risk-Based Concentration Table published by the U.S. Environmental Protection Agency. Alternatively, the agreement allows a risk assessment to be conducted by NOAA. Acceptance of such a risk assessment is at the sole discretion of the ADEC.

NOAA most often employed Methods One and Two and infrequently applied ADEC Methods Three (i.e. Vehicle Boneyard and Icehouse Lake) for the determination of cleanup levels. When applying Method One, calculations based on site-specific information were used to determine the applicable category (i.e., A-D). When applying Method Two, St. Paul Island falls in the "Under 40 Inch" annual precipitation subcategory. Within this subcategory, NOAA applied the most stringent cleanup level among the ingestion, inhalation, and migration to groundwater pathways to each sites cleanup strategy. Alternative cleanup levels were sometimes applied in conjunction

with Method Two cleanup levels. NOAA proposed and ADEC approved the use of alternative cleanup levels for some sites located in St. Paul Village under 18 AAC 75.345 and 18 AAC 75.350, commonly referred to as the Ten Times Rule (ADEC 2002, Mitretek Systems 2002). According to these regulations, if groundwater beneath a site contains contaminant concentrations above the cleanup levels provided in ADEC Table C (18 AAC 75.345), then the soil may be remediated to levels ten times higher than those provided in Method Two Tables B1 and B2 for the migration to groundwater pathway for those contaminants found in groundwater at concentrations above the cleanup levels provided in ADEC Table C. If, however, the inhalation or ingestion pathway values are more stringent than the migration to groundwater pathway, then the more stringent value is to be applied. NOAA invoked alternative cleanup levels through the Ten Times Rule at fourteen (14) sites within a Critical Water Management Area determined by the Alaska Department of Natural Resources (ADNR 2006). The invocation involved the following groundwater contaminants that exceeded their respective ADEC Table C groundwater cleanup levels: gasoline-range organics (GRO), diesel-range organics (DRO), toluene, and ethylbenzene. Additionally, NOAA sometimes invoked the option under the TPA to cleanup benzene applicable to the State of Alaska level in effect in 1991(ADEC 1991). (Note: at sites where alternative cleanup levels applied, NOAA elected to pursue the extent of soil excavation using Method Two cleanup levels unless obstructions or equipment limitations prevented further excavation).

Although arsenic and chromium have been detected at St. Paul Island remedial sites above ADEC soil cleanup levels, they are not considered contaminants of concern and thus are not discussed herein. The reason being there is no known anthropogenic source for these metals, and studies indicated they were present at concentrations consistent with island background levels (Tetra Tech 2000a).

III. Summary of Residual Contamination at NOAA-Remediated Sites

This section summarizes the known occurrence residual soil contamination at St. Paul Island, the nature of the residual contamination, and the reason(s) the contamination remains in situ. Information is presented for all sixty TPA and non-TPA sites investigated and/or remediated by NOAA and its contractors at St. Paul Island. Also provided is the applicable cleanup level method (e.g., ADEC Method Two) for each site. For analyte-specific cleanup levels, please refer to the tables referenced in Section II or documents referenced therein. Table 3 presents an island-wide summary of residual soil contamination and buried solid wastes.

Oil Drum Dump, Site 1; TPA Site 1 (Figures 2 and 4)

NOAA Site 1/TPA Site 1 is located adjacent to Formerly Used Defense Site (FUDS) B-1. The area of these sites has commonly and collectively been referred to as the Oil Drum Dump Site. Department of Defense and NOAA contractors conducted drum and debris removals at the Oil Drum Dump Site on several occasions from 1986 to 1997 (NOAA 2004b). Thousands of drums originally staged as a waste oil dumpsite were removed by the Corps of Engineers and NOAA during separate efforts. NOAA contractors conducted site characterization activities during 1999 (Tetra Tech 2000b) and 2000 (CESI 2002), collecting 123 characterization samples from eighty-four (84) locations (NOAA 2004b). Samples exceeded the ADEC Method Two cleanup level for DRO and RRO, with a maximum concentration of 18,000 mg/kg and 110,000 mg/kg, respectively. The RRO exceedances were all collocated with DRO exceedances. To date, no contaminated soil has been removed from the Oil Drum Dump Site.

NOAA has estimated that 5,761 cubic yards of contaminated soil require removal from the Oil Drum Dump Site to meet ADEC standards (NOAA 2004b). Investigations have shown, however, that contamination at Site 1/TPA Site 1 is most likely the result of spills and leakage during the U.S. Army Corps of Engineers' (Department of Defense) staging of drums on the site in 1986 or deterioration of drums brought to and abandoned on Site 1/TPA Site 1 by the U.S. Army Corps of Engineers (NOAA 2004b). Section 3(f)(2) of Public Law 104-91, as amended by Public Law 106-562, which authorizes the funding for NOAA's Pribilof Islands cleanup activities, stipulates: "None of the funds authorized by this subsection may be expended for the purpose of cleaning up or remediating any landfills, wastes, dumps, debris, storage tanks, property, hazardous or unsafe conditions, or contaminants, including petroleum products and their derivatives, left by the Department of Defense or any of its components on lands on the Pribilof Islands, Alaska." Accordingly, NOAA is precluded from taking further action at this site.

Vehicle Boneyard, Site 2; TPA Site 2 (Figures 2 and 5)

Construction and demolition debris, automotive parts, and asbestos-containing material (ACM) remain in the subsurface soil of this site. A two-foot thick soil cover or cap was placed atop the area of the solid wastes and ACM. NOAA applied native seeds and fertilizer to establish vegetation upon the cap to inhibit soil erosion (NOAA 2005b).

No removal of contaminated soil occurred at this site. NOAA believes that soil analyte concentrations are most accurately depicted by the characterization soil samples it collected in 2004, instead of samples collected in 1999 by a NOAA contractor. The 2004 samples collected at and near the single 1999 sample containing elevated levels of DRO and RRO, indicated analyte concentrations were below the site-specific ADEC Method Three cleanup levels calculated for the site (NOAA 2005b).

Little Polovina Boneyard, Site 3; TPA Site 3 (Figures 2 and 6)

All surface debris consisting of automotive parts was removed from this site; no known buried solid wastes were known to exist at the site. A soil confirmation sample collected from the site indicated that petroleum hydrocarbon concentrations were below ADEC Method One, category D cleanup levels and that no other analytes were detectable (Tetra Tech 2000c).

Dune Vehicle Boneyard, Site 4; TPA Site 4 (Figures 2 and 7)

All surface debris consisting of automotive parts was removed from this site; no known buried solid wastes were known to exist at the site. Soil confirmation samples collected in 1999 indicated that petroleum hydrocarbon concentrations were below ADEC Method One, category C cleanup levels and that no other analytes were detectable (Tetra Tech 2000d). Additionally, field screening and visual inspections conducted in 2000 gave no indication of soil contamination (Nortech 2001a).

St. Paul Landfill Cell C, Site 5; TPA Site 5a (Figures 2 and 8)

Cell C, located within Tract 42, served as an intermittent municipal solid waste (MSW) landfill for approximately forty years, with the City of St. Paul beginning exclusive use of Tract 42 for MSW disposal in the early/mid 1990s. The landfill cell operated without a State of Alaska permit, and neither the federal government nor the City of St. Paul kept records of disposal practices. The landfill potentially contains numerous items that could contribute to soil, air, and groundwater contamination. During 2003 and 2004, NOAA and its contractor stockpiled approximately 25,267 cubic yards of PCS at Tract 42, subsequently using it to construct a soil closure cap atop Cell C MSW. During 2006 and again in 2007, NOAA dug small trenches within the cap to bury demolition debris and non-RCRA regulated lead contaminated soils removed from various sites in the village. NOAA applied native seeds and fertilizer to establish vegetation upon the cap to inhibit soil erosion.

St. Paul Landfill Cell A, Site 6; TPA Site 5b (Figures 2 and 9)

NOAA contractors removed drums and PCS from the site, and capped the site with two feet of clean sand and scoria (Tetra Tech 2004k). One known area of soil contamination mixed within concrete rubble exceeded the ADEC Method Two cleanup levels for DRO and RRO, at 771 mg/kg and 11,000 mg/kg respectively (TTEMI 2000). During landfill closure, this contaminated area was first covered with several feet of clean soil, in addition to the 2-foot cap (Tetra Tech 2004k). NOAA applied native seeds and fertilizer to establish vegetation upon the side slopes of the cap to inhibit soil erosion.

St. Paul Landfill Cell B Drum Dump, Site 7; TPA Site 5c (Figures 2, 10a and 10b)

This site served as a disposal location for barrels containing waste oil products. Soil confirmation samples exceeded the ADEC Method Two cleanup level for DRO and RRO, with a maximum concentration of 6,100 mg/kg for DRO and 16,000 mg/kg for RRO. Each of the RRO exceedances was co-located with a DRO exceedance (Tetra Tech 2004k).

The residual DRO and RRO contamination at this site occurred at depths less than fifteen (15) feet bgs and above groundwater. NOAA and ADEC discussed the practicality of leaving some contamination in place because of the relative high cost of removal to the low potential risk (NOAA 2003). Subsequently, the City of St. Paul placed approximately twenty-two vertical feet of clean soil over the site during construction of its new permitted and interim municipal solid waste landfill. NOAA and ADEC agreed that long-term groundwater monitoring at up to eight wells for petroleum analytes would serve to evaluate leaving in place petroleum-contaminated soil (PCS) exceeding the cleanup level for the groundwater pathway. The long-term groundwater sampling plan has been negotiated between NOAA and ADEC as part of NOAA's long-term operations and maintenance responsibility (NOAA 2005a).

St. Paul Landfill Cell B Solid Waste, Site 8; TPA Site 5d (Figures 2, 9a and 9b)

The remedial action objective for Site 8 focused on the removal of municipal solid waste scattered about the ground surface by using a bulldozer to relocate it to Tract 42 for proper landfilling. The general area of debris included in the vicinity of the Cell B drum dump (Site 7/TPA Site 5c) and land outside the northwesterly corner of Tract 42 (Figures 9a and 9b). NOAA removed all identified buried municipal solid waste at Site 8, relocating it to Site 5 for consolidation and ultimately capping as part of Site 5 closure (Figure 7; Tetra Tech 2004k, NOAA and Tetra Tech 2005). Cleanup of contaminated soil was not an objective for Site 8.

Pumphouse Lake, Site 9; TPA Site 6 (Figures 2 and 11)

Some surface debris was removed from this site. No soil staining, stressed vegetation, sheen on surface water, or any other evidence of contamination was observed; therefore, no soil samples were collected at this site (Nortech 2001b).

NMFS Fuel Barge: North End Lagoon, Site 10; TPA Site 7a (Figure 2)

NOAA and its contractor removed what was referred to as Barge A from this site (Nortech 2001c). Barge A was a derelict barge that presumably came to rest following a storm. One soil confirmation sample was collected from beneath the removed barge. Sample results following Method One, category C and Method Two criteria indicated analytes were below applicable cleanup levels.

NMFS Fuel Barge: Lagoon Channel, Site 11; TPA Site 7b (Figure 3)

NOAA and its contractor removed what was referred to as Barge B, another derelict barge, from this site (Nortech 2001c). One soil confirmation sample collected from beneath the barge site indicated analytes were below applicable Method One, category C and Method Two cleanup criteria. A confirmation sample was collected from under the temporary containment pond constructed in the crab pot storage area southeast of Barge B. The containment held sediments and slurry water collected during barge removal activities. Petroleum hydrocarbons in this sample were below Method One, category C cleanup criteria. Five polycyclic aromatic hydrocarbons (PAHs), however, were detected above Method Two cleanup criteria. These contaminants appeared unrelated to the temporary containment pond because they were not detected in other samples collected from within or under Barge B. Furthermore, NOAA and its contractor took precautions to prevent surface soil contamination during the installation and use of the containment pond. NOAA believes this contaminated soil was subsequently removed during cleanup actions associated with Sites 34 and 35, although PAHs were not detected above cleanup levels during those cleanup actions (NOAA 2005c).

NMFS Fuel Barge: Black Bluff, Site 12; TPA Site 7c (Figure 3)

NOAA and its contractor removed what was referred to as Barge C from this site (Nortech 2001c). Barge C was a fuel barge that broke it mooring at St. George Island and drifted upon the rocks below Black Bluff (Cemetery Cliffs) near East Landing at St. Paul Island. Years of battering by storm induced waves eventually corroded and broke the barge to pieces, which scattered within the intertidal and shallow sub-tidal environment. No staining or oil sheen was observed during tidal cycles; hence, no soil sampling was conducted at this site.

NMFS Fuel Barge: East Landing, Site 13; TPA Site 7d (Figure 3)

NOAA and its contractor removed what was referred to as Barge D from this site (Nortech 2001c). No evidence of spills, leaks, or stained soils was observed, nor was soil contamination suspected given the barge had been moved empty to this site for storage. No soil samples were collected at this site.

NOAA Landfills, Sites 14 and 15; TPA Site 8 (Figures 3, and 12)

The Two-Party Agreement Attachment A refers to the "NOAA Landfill" as Site 8. Map Figure 4-2 within the TPA recognizes a "NOAA Landfill" on Reef Point and a "NMFS Landfill" below Village Hill. Internal NOAA administrative procedures renamed these sites as Site 14 NMFS Landfill (also referred to by various investigators as "Reef Point Landfill (Dump)), and Site 15 (NOAA Village Landfill, and also referred to by various investigations as "NOAA Landfill Cliffside", "Cliffside Dump" and "Cliffside Landfill"), respectively.

NMFS Landfill Site 14 is along the northern shoreline of Reef Point. Reef Point is a fur seal and bird rookery, and as such it is an active federal facility thereby precluding the landfill from TPA oversight. Prior to recognizing the NMFS Landfill at Reef Point, NOAA proceeded with site investigations. The NMFS Landfill Site at Reef Point was purportedly used two or three times to burn wood debris, and the ash was buried at the site, but otherwise several investigations using interviews of local residents, soil testing, and visual and magnetometer techniques failed to discover anything other than surface debris (pipe and barrels), which were removed (Tetra Tech 2000e and Nortech 2001d). Tetra Tech and Nortech removed the exposed surface debris, but they concluded other wastes either did not exist or was sufficiently buried under a vegetated cover.

NOAA Village Landfill Site 15 ("NMFS Landfill" according to the TPA document) along the southerly slope of Village Hill served as the communities refuse disposal dumpsite. Tetra Tech (2000e) described four areas with solid wastes. NOAA removed surface solid waste from these areas, including debris eroded out of Village Hill's steep slope. Soil confirmation samples collected from beneath a lead-acid battery at this site indicated lead above the ADEC Method Two industrial cleanup level of 1,000 mg/kg (Nortech 2001d). After removing the battery from the site, NOAA contractors twice attempted to excavate lead-contaminated soil to meet the ADEC Method Two lead cleanup level for industrial land use (1,000 mg/kg). The final soil confirmation sample collected from the limited quantity of soil trapped in pockets and crevices or fractures within the basaltic bedrock yielded a lead concentration of 3,380 mg/kg. Further excavation in this area was impracticable. No other sign or source of soil contamination was observed at the NOAA (Village) landfill; hence, no other soil sampling was conducted at this site. NOAA removed all surface debris excepting that lodged between rock crevices along the basaltic shoreline.

Old Movie Theater, Site 16; TPA Site 9a (Figure 3)

A 55-gallon barrel served to fuel a heater within the former movie theater. Soil confirmation samples taken following excavation of contaminated soil at the former AST site were all below the ADEC Method One, category C cleanup levels applied at this site (NOAA and BSE 2004a).

Former Power Plant (Former Post Office), Site 17; TPA Site 9b (Figures 3 and 13)

Fuel spills related to a former AST storage farm servicing the former power plant, and a floor drain used to dispose of spilled fuels and grease within the building led to soil contamination at this site. One soil confirmation sample collected following excavation exceeded the Ten Times Rule alternative cleanup level for DRO with a concentration of 2,690 mg/kg. It was collected on the edge and below a buried concrete slab extending from the north end of the existing building where further excavation was impractical (NOAA and BSE 2004b). DRO

exceeded the Method Two cleanup level at six other locations, where excavation was prohibited by bedrock, proximity to the existing building, or equipment accessibility limited by the steep hill slope adjacent to the site on the west side of the former power plant. NOAA is addressing groundwater contamination (DRO) under its long-term groundwater monitoring plan (NOAA 2005a).

Decommissioned Power Plant, Site 18 - TPA Site 9c (Figures 3 and 14)

This site was referred to in the Two-Party Agreement Attachment A as "Power Plant Site 9b". Internal NOAA procedures renamed this site as the Decommission Power Plant TPA Site 9c. Over time, three USTs provided fuel to fire the generators in the power plant. Spillage and releases from these USTs resulted in soil and groundwater contamination. Utility raceways within the concrete foundation captured fuel releases from distribution pipe leaks and presumably contributed to soil and groundwater contamination. Several excavations involving the removal of the USTs and contaminated soil occurred at this site. During 2007, the power plant building and foundation was demolished thereby exposing additional and previously inaccessible contaminated soil. Further excavation was limited by the presence of buried utility lines, roads, equipment encountering refusal at basalt, and depth beyond the practical limits of the excavation equipment (i.e., excavator reach from accessible areas). Several soil confirmation samples taken in the southeastern half of the excavation footprint and at depths greater than 15 feet bgs exceeded the ADEC Method Two cleanup level for DRO. Three of those soil samples exceeded the Ten Times Rule cleanup level for DRO. The maximum DRO concentration was 14,400 mg/kg. No other contaminants exceeded their site cleanup level under the Ten Times Rule; however, GRO exceeded its ADEC Method Two cleanup level at depths greater than 15 feet bgs in very limited areas of the excavation footprint. The maximum GRO concentration above Method Two was 481 mg/kg. Benzene exceeded the Method Two 0.02 mg/kg cleanup level with a concentration of 0.359 mg/kg at a single location, but also at a depth greater than 15 feet bgs, and not above the alternative cleanup level of 0.5 mg/kg (NOAA and BSE 2004f, NOAA 2008a). NOAA is addressing groundwater contamination (DRO) under its long-term groundwater monitoring plan (NOAA 2005a).

Decommissioned Power Plant Annex, Site 19; TPA Site 9d (Figures 3 and)

Soil became contaminated as a result of releases from fuel transfer lines running underground near the site and originating from the former West Dock Fuel transfer facility (Site 51; TPA Site 9p). Four areas were linked to this site. No contamination was detected within Areas 2, 3, or 4. Area 1 included land located predominantly between the Annex and the Decommissioned Power Plant, and where gasoline and diesel fuel transfer lines ran. Soil confirmation samples exceeded the ADEC Method Two cleanup level for DRO with a maximum concentration of 10,000 mg/kg. Further excavation was limited by the presence of electrical utility lines, and depth beyond the practical limits of the excavation equipment (i.e., excavator reach from accessible areas); however, the excavation depth of 15 feet bgs was sufficient to mitigate the inhalation and ingestion exposure pathways. No other contaminants exceeded their site cleanup level under the Ten Times Rule; however GRO and benzene contamination exceeded their ADEC Method Two cleanup levels with a maximum GRO concentration of 310 mg/kg and a maximum benzene concentration of 0.11 mg/kg (Tetra Tech 2004a).

Municipal Garage/Machine Shop, Site 20; TPA Site 9e (Figures 3 and 15)

The Municipal Garage/Machine Shop Site was referred to under the general heading of "Tract 41" Site 9, as well as, Municipal Garage UST vent fill/pipe (Tract 41) 9c and Municipal Garage Drum Staging Area (Tract 41) 9d in the Two-Party Agreement Attachment A. The Machine Shop once served the sealing industry with equipment such as lathes and drill presses and automotive repair. No soil contamination is known to exist around or beneath the Machine Shop. The Municipal Garage served as storage, and possibly light maintenance for equipment. Soil and groundwater around and beneath the Municipal Garage became contaminated as a result of former nearby AST and UST storage facilities, leaks from underground fuel transfer lines, spills within the building, and disposal of fuels or petroleum wastes down floor drains, which discharged directly into native soils. The Municipal Garage was demolished during 2007 (NOAA 2008b). Soil confirmation samples taken following the completion of all excavation work indicated DRO, GRO, toluene, and ethylbenzene exceeded their Ten Times Rule cleanup levels

with a maximum concentration of 18,000 mg/kg for DRO, 3,160 mg/kg for GRO, 123 mg/kg for toluene, and 86.1 mg/kg for ethylbenzene. Total xylenes exceeded its Method Two criterion (78 mg/kg) in several confirmation samples with a high value of 552 mg/kg., All samples with total xylenes exceeding its Method Two criterion came from the water table smear zone. The Ten Times Rule does not apply to total xylenes because it was not a contaminant of concern in groundwater. If the Ten Times Rule had applied to this analyte at the maximum concentration detected, it would have been below the criterion allowed under the Rule. Benzene exceeded its 1991 criterion (0.5 mg/kg) with a maximum concentration of 0.639 mg/kg. No other contaminants exceeded their ADEC Method Two cleanup levels (Tetra Tech 2004f, NOAA 2008a) NOAA is addressing groundwater contamination (DRO, GRO, benzene, toluene, and ethylbenzene contamination) under its long-term groundwater monitoring plan (NOAA 2005a).

Old Coal Shed (Cascade Building), Site 21; TPA Site 9f (Figures 3 and 16a-f)

The Old Coal Shed served as a coal storage facility when coal was used for heating on the island. The coal shed was eventually demolished and a steel frame and sheet metal roof and sided building, referred to as the Cascade Building, was constructed upon the shed foundation. The Cascade Building served for storage and maintenance of heavy equipment, and various other items. This site includes a former gasoline station that was located immediately north-northwest of the Cascade Building. Soil confirmation sample results indicated that DRO, GRO, toluene, and ethylbenzene in soils at the water table exceeded the Ten Times Rule criteria in areas outside the Cascade Building footprint; benzene exceeded the 1991 benzene criterion of 0.5 mg/kg in areas outside the footprint. No further excavation outside the footprint was practicable due to buried utilities, roadways, and groundwater. PCS, likely associated with equipment fueling, maintenance, and leaks was also removed from seven hot spot locations within the Cascade Building. Soil confirmation samples collected within the building indicated no contaminant analytes exceeded their site cleanup levels. NOAA is addressing groundwater contamination (DRO, GRO, benzene, toluene and ethylbenzene contamination) under its long-term groundwater monitoring plan (NOAA 2005a).

Former Fouke Bunkhouse, Site 22; TPA Site 9g (Figure 3 and 17)

The furnace within the former bunkhouse used by government contractors was fueled by a UST and an AST. Soil confirmation samples collected following removal of the UST, AST, and PCS from this site indicated contaminant analyte concentrations were below applicable site cleanup levels; DRO was less than its Ten Times Rule cleanup level, however it exceeded its Method Two cleanup level with a maximum concentration of 1,200 mg/kg (Tetra Tech 2004d).

Former Alaska Dormitory, Site 23; TPA Site 9h (Figures 3 and 18)

The Alaska Dormitory served as sleeping quarters and mess hall for seasonal workers. Releases of fuel oil associated with an UST resulted in DRO soil and groundwater contamination. Soil confirmation samples taken following the completion of all excavation work indicated DRO exceeded its Ten Times Rule cleanup level with a maximum concentration of 13,900 mg/kg (NOAA and BSE 2004e). Further excavation in these areas was not practical due to the shallow depth of the water table, a service water main and the building foundation. DRO contamination likely extends beneath the building. NOAA is addressing groundwater contamination (DRO) at this site under its long-term groundwater monitoring plan (NOAA 2005a).

E-Shop/Radio Building and Duplex, Site 24; TPA Site 9i (Figures 3 and 19)

The Duplex is a multi-family residence formerly associated with the U.S. Navy radio station complex; although it was moved to this location after the Navy transferred the radio station to the Bureau of Fisheries. The two USTs fueling the oil furnaces within the Duplex and the removal of contaminated soil from this site required four separate excavations (Tetra Tech 2005a). Soil confirmation samples collected from the excavation on east side of the Duplex Building indicated contaminant concentrations were below Ten Times Rule and Method Two cleanup levels. Soil confirmation samples collected from the excavation on the west side of the Duplex Building contained lead above the ADEC Method Two residential cleanup level with a concentration of 627 mg/kg at a depth of 2 feet

bgs (Figure 15). Lead contaminated soils from the surface to two-feet bgs were treated under Site 60 (see below). Lead contamination at two-foot bgs or greater depth does not pose an unacceptable risk due to lack of receptors, and further removal was not practicable due to buried utilities (Tetra Tech 2005a). No other contaminants were found above their site cleanup levels; however, DRO exceeded the ADEC Method Two cleanup level.

Excavation activities at the Former Radio Station Electrical Shop (E-Shop) focused on the northeast, northwest, and southeast corners. The sources of contamination included ASTs located along the east side of the building and at the northwest corner of the building. NOAA observed at least one active release from the AST at the northwest corner, owned by the Aleut Community of St. Paul (a.k.a. Tribal Government) and used to provide heating fuel for the Head Start Program which occupied the E-Shop. Complete removal of contaminated soils was prevented by the presence of buried utilities, including electrical, telephone, and sewer. DRO concentrations remaining in soils along the northwest corner following excavation reached as high as 21,000 mg/kg. At the northeast excavation site, soil confirmation samples collected indicated DRO exceeded its Ten Times Rule cleanup level with a maximum concentration at 2,700 mg/kg (NOAA 2005d). No further removal was practicable at this location due to the proximity of a buried waterline.

One of the five samples collected from the southeast excavation contained lead above the ADEC Method Two residential cleanup level with a concentration of 4,090 mg/kg at a depth of five (5) feet bgs. Lead contamination at this depth does not pose a risk due to lack of receptors, and further removal was not practicable due to buried utilities (Tetra Tech 2005a).

Five Car Garage and Anderson Building, Site 25; TPA Site 9j (Figures 3 and 20)

The five car garage served as an automotive maintenance and repair facility. A suspected floor drain was traced from the north side of the building and may have been responsible for the observed contamination of DRO and RRO. Soil confirmation samples collected from this site following soil excavation indicated analyte concentrations were below Method Two site cleanup levels (Tetra Tech 2004j). Benzene was below the 1991 cleanup level of 0.5 mg/kg, but it was above the Method Two cleanup level of 0.02 mg/kg in soil at the water table.

The Anderson building was constructed in 1987 after the end of the fur sealing industry. The Anderson building was used as a seafood storage facility. Three inactive ASTs were located on the easterly end of the building and may have contributed to the observed contamination by petroleum products. Following excavation, no soil contamination was observed above the Method Two cleanup levels, although the laboratory reporting limits for benzene at 0.04 mg/kg exceeded the Method Two level of concern (0.02 mg/kg.). However, NOAA had applied its alternative cleanup level of 0.5 mg/kg to this site.

AST Saddle Complex, Site 26; TPA Site 9k (Figures 3 and 21)

The AST saddle complex was a storage tank farm consisting of up to thirty-three tanks holding diesel fuel and gasoline. The ASTs were filled manually by pouring the contents from barrels into a gravity feed system originating atop of Village Hill at the Municipal Garage Staging Area (a.k.a., Former Gasoline/Diesel Drum Storage, Site 50) as well as pouring the contents of barrels directly into each tank. Spillage associated with this process and likely leaks from the transfer pipes running to various endpoints within the sealing industrial area gave rise to soil and groundwater contamination. Contaminated lead soil was found and completely removed from the site. Soil confirmation samples exceeded the Ten Times Rule alternative cleanup level for DRO with a maximum concentration of 9,100 mg/kg (Tetra Tech 2004g). The samples exceeding the cleanup level for DRO were collected from the excavation bottom and west sidewall. Benzene did not exceed NOAA's criterion of 0.5 mg/kg, but it did exceed the current 0.02 mg/kg criterion at a limited number of confirmation sampling locations at the bottom of the excavation. No further excavation was conducted in these areas because maximum depths (up to 17 feet bgs) were obtained, large boulders were encountered, or stability of the steep wall of the excavation posed unacceptable safety risks. No other contaminants exceeded their ADEC Method Two. NOAA applied native seeds and fertilizer to establish vegetation cover to inhibit soil erosion. NOAA is addressing groundwater contamination (DRO) at this site under its long-term groundwater monitoring plan (NOAA 2005a).

Old Sealing Plant (a.k.a. Barreling Shed), Site 27; TPA Site 9ℓ (Figure 3)

The St. Paul sealing industrial complex, or the old sealing plant, consisted of numerous buildings in the Village of St. Paul. By the 1990s most of the buildings associated with the sealing plant itself had been demolished, excepting the Barreling Shed. Due to safety concerns over the buildings structural integrity, NOAA demolished the building in 2000 (Nortech 2001e). Soil characterization in the vicinity of the old sealing plant identified a small area of DRO contamination. Soil confirmation samples collected from this site following excavation indicated no contaminant analytes exceeded their Method Two cleanup levels (Tetra Tech 2004b).

Salt Water Wells, Site 28; TPA Site 9m (Figures 3 and 22)

Sealing industry processes required the use of large volumes of salt water. Two-Party Agreement Attachment A identified three salt water wells and referred to them as TPA 9e. Subsequently NOAA identified two additional salt water wells, and internal NOAA procedures renamed these wells as TPA Site 9m. Five former salt water wells were located within Tract 46, the sealing industrial area. NOAA found petroleum compounds exceeding ADEC Table C cleanup levels in groundwater samples taken from all five of the now decommissioned salt water wells. The salt water well pump house located at the southwest corner of the Decommissioned Power Plant building was demolished in 2007 along with the Decommissioned Power Plant (NOAA 2008b). NOAA is addressing groundwater contamination at this site under its long-term groundwater monitoring plan (NOAA 2005a).

Former Gasoline Tank Farm, Site 29; TPA Site 10 (Figure 3)

The former gasoline AST farm was located along the northwestern area on top of Village Hill. NOAA dismantled the four 25,000 gallon ASTs during the early 1990s. Site characterization data indicated that no contaminants occurred at the site above Method Two action levels (Tetra Tech 2000f).

Diesel Tank Farm, Site 30; TPA Site 11 (Figures 3 and 23)

NOAA removed six 80,000 gallon diesel fuel ASTs atop of Village Hill during the late 1980s. Spillage associated with the tank farm resulted in soil contamination at the site. NOAA and its contractor removed PCS from this site. Soil confirmation samples indicated DRO exceeded its ADEC Method Two cleanup level, at a maximum concentration of 42,000 mg/kg (Tetra Tech 2004h). Excavation of contaminated soil was conducted to the maximum extent practicable. Most of the contamination remaining is at a depth of fifteen feet bgs or greater. Excavation to the east of the site was also limited by Rim Rock Drive and a 10-inch water main. Petroleum analytes were detected in groundwater at the site but not above Table C criteria.

Lukanin Bay, Sites 31, 32, and 33; TPA Site 12 a, b, and c (Figures 2 and 24)

The interior shoreline along Lukanin Bay was once considered far enough from the Village to serve as a solid waste debris disposal site. The TPA identified three areas of debris disposal. One area (Site 33; TPA 12c) also received used petroleum products. Soil confirmation samples collected from the Site 33 excavation found analyte concentrations below ADEC Method Two cleanup levels (Tetra Tech 2005c). Exposed, partially exposed, and near surface debris was removed from all three sites. NOAA applied native seeds and fertilizer to establish vegetation cover to inhibit soil erosion at Sites 31(TPA 12a) and 33 (TPA 12c), though data indicated no solid waste remains at these locations. NOAA did not find groundwater contamination at these sites.

Salt Lagoon Diesel Seep, Sites 34 and 35; TPA Sites 13a and 13b (Figures 3 and 25)

A seal carcass by-products plant operated at this site beginning in 1918. Petroleum hydrocarbon releases resulted from spillage by drums containing fuel and seal oil, spillage within the building washed into floor sumps discharging directly into soil, and releases from pipes conveying heating oil and seal oil caused soil and groundwater contamination of the site uplands. Groundwater seeps emanating from the site shoreline caused visible petroleum sheens on the surface of the Salt Lagoon Channel, a waterway of the United States. The sheen represented a violation of the federal Clean Water Act (33 U.S.C. 26). NOAA undertook corrective action to eliminate the source

of the petroleum sheen (NOAA 2004c). Corrective action included the removal of site PCS exceeding ADEC Method Two cleanup levels. Restoration followed remedial activities. Restoration included replacing the shoreline along the channel, and bringing the uplands to the surrounding grade level. Although NOAA contractors removed PCS from the saturated zone down to elevations that varied from -1 (one) foot mean lower low water (MLLW) to -4 (four) feet MLLW, contamination remained in the saturated zone. NOAA installed two permeable granulated activated carbon (GAC) adsorption trenches in parallel series within the groundwater table. The GAC serves to adsorb the dissolved petroleum analytes and to prevent the continuation of oil sheening in the adjacent Salt Lagoon channel. Soil confirmation samples from the smear zone indicated DRO and GRO exceeded their ADEC Method Two cleanup levels at very limited areas within the site. Residual DRO contamination peaked at a maximum of 14,000 mg/kg, and GRO contamination peaked at a maximum of 310 mg/kg (NOAA 2005c). NOAA is monitoring groundwater at this site under its long-term groundwater monitoring plan (NOAA 2005a). Since June 2006, groundwater at the site has not exceeded ADEC Table C cleanup levels for DRO or any other contaminant analyte.

Icehouse Lake, Site 36; TPA Site 14 (Figure 2 and 26)

Two-Party Agreement Attachment A referred to this site as "Icehouse Lake Buried Vehicle Boneyard". A freshwater pumping station operated at this site beginning in the 1920s. Fuel spills occurred during filling of the AST(s). During the early period of operation gasoline was used to power the pump. During later periods, diesel fuel powered the pump. The use of gasoline at the site may be responsible for the lead contamination found in groundwater at the site. NOAA applied Method Three to derive cleanup criteria. Soil confirmation samples taken following several excavation events found no contaminants exceeded the Method Three criteria (NOAA 2005e). NOAA is addressing groundwater contamination at this site (GRO and DRO; dissolved lead had been a contaminant of concern, but the 2007 sampling round detected lead below its cleanup criterion) under its long-term groundwater monitoring plan (NOAA 2005a).

Telegraph Hill Scoria Pit, Site 37; TPA Site 15a (Figures 2 and 27)

According to Two-Party Agreement Attachment A "drums and heavy machinery [were] abandoned at" the Telegraph Hill Scoria Pit. In the 1980s, the Corps of Engineers attempted to cleanup the site under its Formerly Used Defense Site (FUDS) Program. Subsequently the site was placed on the TPA to address the need for further removal of heavy equipment debris, empty oil drums, PCS cleanup, and an investigation of the threat to groundwater. Site characterization data indicated minor, isolated PCS existed at the site (NOAA 2004c). DRO was detected at 410 mg/kg, above the ADEC Method Two cleanup level of 250 mg/kg, in a location where a small but obvious stain existed on the soil. No documentation was found to confirm when and if this contaminated soil was removed, but contractors were directed to remove the stained soil (pers. comm., J. Lindsay). Subsequent analysis of a soil sample from a location 4.6 feet to the northeast did not detect DRO above the ADEC Method Two cleanup level. Additionally, NOAA's contractor reported that no soil staining, stressed vegetation, hydrocarbon odors, or other indications of the presence of contamination were observed at Telegraph Hill during 2000 site closure activities (Tetra Tech 2000g; Nortech 2001f). NOAA found detectable concentration of petroleum analytes in groundwater at Telegraph Hill, but not at concentrations exceeding Table C criteria. This site is also a FUDS. PL106-562 precludes NOAA from accepting environmental liability at this site. Nonetheless, NOAA requested concurrence with a no further remedial action determination for this site as NOAA believed site conditions supported such a determination. ADEC concurred with a no further remedial action determination for this site (ADEC 2004).

Lake Hill Scoria Pit, Site 38; TPA Site15b (Figure 2)

According to the TPA "drums and heavy machinery [were] abandoned at the Lake Hill Scoria Pit. Also, according to Two-Party Agreement Attachment A all unburied drums had been removed from the site. At some point in time, abandoned equipment was also removed from the site. Subsequently, The Aleut Corporation and Tanadgusix Corporation instituted a large scale quarry operation at the site. No visual or olfactory evidence of contaminated soil was observed at this site; therefore, no soil samples were collected (Tetra Tech 2000g).

Ridge Wall Scoria Pit, Site 39; TPA Site 15c (Figure 2)

According to the TPA "drums [were] abandoned at the Ridge Wall Scoria Pit. Also, according to Two-Party Agreement Attachment A all unburied drums and miscellaneous debris had been removed from the site. Subsequently, additional surface debris in the form of empty steel barrels were removed from this site. The Aleut Corporation and Tanadgusix Corporation instituted a moderate scale quarry operation at the site. No visual or olfactory evidence of contaminated soil was observed at this site; therefore, no soil samples were collected (Tetra Tech 2000g).

Aleut Bunkhouse, Site 40; NTPA (Figure 2)

The Aleut bunkhouse was constructed on cement footings at Northeast Point to house sealing crews in the early 1900s. NOAA's contractor removed solid wastes, primarily wooden debris, from this site. No soil sampling was conducted because there were no signs or evidence of contamination and the pit within the cement foundation was backfilled with clean scoria (Nortech 2001g).

Bulldozer in Bog, Site 41; NTPA (Figure 2)

A bulldozer became mired in muck on the edge of a small lake in the 1960s. NOAA's contractor removed abandoned bulldozer from this site. No soil or sediment sampling was conducted because there were no signs or evidence of contamination (Nortech 2001h).

Explosives Storage Bunker, Site 42; NTPA (Figure 3)

Presumably, the Bureau of Commercial Fisheries and subsequently the National Marine Fisheries Service stored explosives used to blast rock in this concrete bunker. NOAA's contractor removed and incinerated blasting caps and miscellaneous debris stored at this site which had a concrete floor. No soil sampling surrounding the bunker was conducted because there were no signs or evidence of contamination (Nortech 2001i).

Barrels at North End of Salt Lagoon, Site 43; NTPA (Figure 2)

Storm tides are suspected of transporting the empty or partially empty barrels to this site. Data from samples collected at this site following the removal of drums indicated that soils left in place are unlikely to be contaminated by petroleum hydrocarbons at levels exceeding applicable ADEC soil cleanup standards (Nortech 2001j).

Big Polovina Debris, Site 44; NTPA (Figure 2)

NOAA staged debris gathered from various locations on the northeasterly end of St. Paul Island on a liner at the Big Polovina quarry site until proper disposal arrangements could be made. Subsequently, NOAA removed the debris and liner during 2000 (Nortech 2001k). Potential residual RRO contamination recognized through soil sampling and chemical analysis was handled by NOAA separately as Site 59.

Southwest Point Former LORAN, Site 45; NTPA (Figure 2)

The U.S. Coast Guard formerly operated a long-range aid to navigation facility at Southwest Point. Used lead batteries and other solid waste debris were disposed at isolated spots on the nearby tundra. Following debris and lead contaminated soil removal by NOAA, soil confirmation samples indicated that lead, the contaminant of concern, was below the ADEC industrial soil cleanup level (CESI 2001a, Nortech 2001l).

Blubber Dump Debris, Site 46; NTPA (Figures 2 and 28)

A gully along the south side of the Blubber Dump/Enhanced Thermal Conduction Soil Treatment Facility, and Polovina Hill Stockpile (Site 47) was used by NOAA to dispose of seal blubber. Purportedly, solid wastes were also disposed at this site. NOAA's contractor removed metal debris within two feet of the surface from this site.

Evidence of soil contamination, such as staining, odor or stressed vegetation was not observed at this site. Consequently, no soil sampling was conducted for anthropogenic contamination (Nortech 2001m). Following the excavation of metal debris, NOAA applied additional native seeds and fertilizer to establish a vegetated cap to inhibit soil erosion.

Petroleum Contaminated Stockpile (Blubber Dump/Enhanced Thermal Conduction Soil Treatment Facility, and Polovina Hill Stockpile), Site 47; NTPA (Figure 2)

NOAA staged approximately 15,000 cubic yards of petroleum contaminated soil removed from various sites in the St. Paul Village adjacent to the former blubber dump and at the base of Big Polovina Hill on liners at these two sites. Adjacent to the blubber dump PCS stockpile site, NOAA installed an enhanced thermal conduction (ETC) soil treatment facility. NOAA took site closure confirmation samples following removal of the blubber dump PCS and Big Polovina Hill PCS stockpiles, and the dismantling of the ETC Soil Treatment Facility. Laboratory analysis found all analyte concentrations below ADEC Method One, category C cleanup levels (Tetra Tech 2004i; NOAA 2005f).

Windmill Wells, Site 48; NTPA (Figure 3)

The U.S. Navy installed three groundwater wells powered by windmills along the base of Ellerman Heights. NOAA considers these wells a part of the Naval radio station complex Formerly Used Defense Site (FUDS). NOAA tasked its contractor with investigating the windmill wells as part of a larger site characterization effort at a time when the history of the wells was unclear. No evidence of contamination at the wells was found (IT Alaska 2001, NOAA 2005g).

Gas Station and Garage, Site 49; TPA Site 9n (Figure 3)

The St. Paul Island Community Council operated a gas station under the auspices of NOAA, at this site. NOAA removed petroleum contaminated soil from this site. Soil confirmation samples taken following the completion of excavation found contaminant analyte concentrations below ADEC Method Two cleanup levels (BESC 1997). NOAA did not find groundwater contamination at the site, but the site is within the Critical Water Management Area and groundwater monitoring wells are located up and down gradient of the site.

Former Gasoline/Diesel Drum Storage, Site 50 (Figures 3 and 29)

Internal NOAA procedures renamed this site as TPA Site 9o. NOAA predecessors staged fifty-five gallon barrels of gasoline, diesel fuel and kerosene on the northeastern top of Village Hill. These barrels were emptied into a gravity feed system that filled ASTs located on the lower slope of the hill (TPA 9k; Site 26). This process resulted in considerable spillage. NOAA and its contractor removed PCS from the site. Soil confirmation samples exceeded the DRO Ten Times Rule cleanup level with a maximum concentration of 19,000 mg/kg (Tetra Tech 2004e). Excavation of contaminated soil was conducted to the maximum extent practicable based upon equipment limitations affected by the steep slope and the presence of obstructions including a steep slope, large boulders, and bedrock. NOAA is addressing groundwater contamination (DRO) at this site under its long-term groundwater monitoring plan (NOAA 2005a).

West Dock Fuel Transfer Facility (Receiving Warehouse), Site 51; TPA Site 9p (Figures 3 and 30).

The fuel transfer facility received gasoline and various blends of diesel fuel from barges and pumped these fuels to AST farms on the slopes and top of Village Hill. NOAA identified two areas for contaminated soil removal. Following removal at Area 1, no contamination remained at the site. Following excavation, contamination remained at Area 2 because live electrical lines, a building, and rock limited further removal efforts (Tetra Tech 2004a). Soil confirmation samples exceeded the Ten Times Rule cleanup level for DRO, at maximum concentration of 2,600 mg/kg. Two other soil confirmation samples indicated DRO exceeded the Method Two cleanup level. While benzene did not exceed the alternative cleanup level of 0.5 mg/kg at the site, five of eight samples

exceeded the Method Two level of 0.02 mg/kg. NOAA did not find groundwater contamination at the site, but the site is within the Critical Water Management Area and groundwater monitoring wells are located up and down gradient of the site.

Tract 50 Asbestos in Soil, Site 52; NTPA (Figure 3)

NOAA had staged transite tiles, an asbestos-containing material, removed from the exterior walls of various buildings against the outside of an equipment storage building known as the GARCO at Tract 50. Vandals broke many of the tiles and scattered fragments about the area. NOAA manually removed and properly disposed of all remaining transite tiles and fragments from Tract 50. Visual, post-removal inspections conducted by three Tanadgusix Corporation representatives determined the site clean of transite (NOAA 2004a).

Tract A Lot 101, Site 53; TPA Site 9q (Figures 3 and 31)

A UST served the heating unit within this house originally built for government employees in the mid-1920s. NOAA and its contractor removed the UST and PCS. Soil confirmation samples found DRO above the ADEC Method Two cleanup level, at a concentration of 5,040 mg/kg at the north wall of the excavation, adjacent to the house's sidewalk (NOAA & BSE 2004c).. Further excavation in the area of this sample was not practicable. NOAA did not find groundwater contamination at this site.

Tract A Lot 102, Site 54; TPA Site 9r (Figures 3 and 32)

A UST served the heating unit within this house originally built for government employees in the mid-1920s. NOAA removed the UST and PCS. DRO contaminated soil remained in the bottom of the excavation at eighteen (18) feet bgs, beyond the excavator's reach. Soil confirmation samples exceeded the ADEC Method Two cleanup level for DRO with a maximum concentration of 8,300 mg/kg (Tetra Tech 2004c). NOAA did not find groundwater contamination at this site.

Tract A Lot 103, Site 55; TPA Site 9s (Figures 3 and 33)

A UST served the heating unit within this house originally built for government employees in the mid-1920s. Following removal of the UST and excavation of petroleum contaminated soils, confirmation samples collected at the site found analyte concentrations below ADEC Method Two cleanup levels (NOAA & BSE 2004d). NOAA did not find groundwater contamination at this site.

ATCO/Radio Building Barrel Staging Area, Site 56; NTPA (Figures 3 and 34)

Site characterization soil data indicated DRO concentrations exceeded the Ten Times Rule alternative cleanup level near the northeast and northwest corners of the ATCO dormitory and on the west side of the ATCO dormitory (CESI 2001b). Soil characterization samples indicated DRO exceeded the Ten Times Rule alternative cleanup level with a maximum concentration of 27,000 mg/kg. The suspected source of the contamination, an iron fuel-distribution line, is still present though it is inactive. The line had leaks in two locations—about fifty (50) feet from the east end of the building and at the end of the line near former monitoring well MW46-19, where free product (LNAPL) has been found on groundwater (CESI 2000). RRO was detected above the ADEC Method Two cleanup levels in a sample collected from stained surface soil west of the ATCO dormitory.

NOAA has not and does not intend to undertake cleanup activities at this site. Under P.L. 104-91, NOAA is responsible for the clean up of debris and contamination on St. Paul Island resulting from the activities of it and its predecessor agencies. NOAA is not responsible for the cleanup of contamination and debris caused or contributed to by local entities, officials, or landowners after March 15, 2000; or for releases at any time by third parties on private property following property transfer under the Alaska Native Claims Settlement Act or the Transfer of Property Agreement (NOAA 1984); or releases caused by the Department of Defense at any time. The ATCO dormitory and the land on which it is located are owned by the Tanadgusix Corporation; the Radio Building Bar-

rel Staging Area was previously utilized by the Department of Defense (NOAA 2005g). NOAA, in collaboration with ADEC and the Alaska Department of Natural Resources, elected to include this site among others in the City of St. Paul in a Critical Groundwater Management Area that prohibits groundwater well installation and groundwater use within the designated area (NOAA 2005a, ADNR 2006).

Tract 46 Sheet Metal Garage, Site 57; NTPA (Figures 3 and 15)

During the 1970s, NOAA constructed a sheet metal garage upon a concrete floor and foundation that connected to the Machine Shop and Municipal Garage (TPA Site 9e). NOAA demolished the sheet metal garage during February 2005 (NOAA 2006a). No soil samples were collected as the concrete pad was left in place. However, during NOAA's excavation of the Municipal Garage Site in 2007, NOAA learned of a sump in the floor of the former sheet metal garage. Purportedly, workers poured used motor oil into the sump which discharged into the soil. NOAA addressed the resulting soil contamination as part of its soil removal action at the Municipal Garage (NOAA 2008a).

Tract 50 Drum Platform Foundation and Combine Shop UST, Site 58; NTPA (Figures 3 and 35)

A loading and storage platform adjoined the seal carcass by-products plant formerly contiguous with Tract 50. Tanadgusix Corporation demolished the by-products plant in 1987, but left the platform as a three-foot high concrete wall. Soil and miscellaneous debris, especially wood remained interior to the surrounding concrete wall. The former platform was removed by an Army Corps of Engineers contractor during 2004 to make room for a Salt Lagoon dredging project. Subsequently, NOAA removed PCS from this site. Soil confirmation samples exceeded the ADEC Method Two cleanup level for DRO with a maximum concentration of 11,000 mg/kg (Figure 25; NOAA 2005h). The samples exceeding the site's DRO cleanup level were collected from the bottom of the excavation at the groundwater interface (approximately 3 to 4 feet bgs). Further excavation in these areas was not practicable. Groundwater in the area is monitored as part of the Salt Lagoon Site monitoring (TPA 13a).

A UST stored heating oil used to fire a furnace to heat the Combine Shop, located on Tract 50 (Figure 3). NOAA removed the UST and an unspecified quantity of PCS during August 2000. NOAA staged the PCS at NOAA's PCS stockpile at the Blubber Dump (Site 46), eventually treating the PCS using an Enhanced Thermal Conduction system. NOAA and its contractor removed PCS. No confirmation samples exceeded the ADEC Method One, category C cleanup levels (CESI 2001c). NOAA advanced a temporary well-sampling point immediately west of the Combine Shop in October 2000, with one groundwater sample analyzed and found not to have any contaminants exceeding ADEC Table C groundwater cleanup levels (CESI 2001c).

Big Polovina Debris Stockpile Soil, Site 59; non-TPA (Figure 2)

This site is located in an active scoria quarry. Soil characterization samples taken by a NOAA contractor at Site 44 following removal of miscellaneous debris and the underlying liner indicated the presence of RRO above the ADEC Method One, Category D cleanup level applied at the site (Nortech 2001b). The sample was collected at the location of the only visible surface stain. Subsequent sampling at the site did not reveal any contamination. Presumably the contamination was limited to an extremely small surface area, and possibly resulted from a dripping oil pan or hydraulic line (NOAA 2006b).

Lead Contaminated Soils, Site 60; non-TPA (Figures 3, 19, 31, and 33)

Lead-based paint flakes falling off of several buildings, including House 101 (TPA 9q), House 103 (TPA 9s), and the Duplex (part of TPA 9i) contaminated surface soils to depths of two-feet bgs. Lead-based paint flakes contaminated surface soils only at House 102. After in-situ treatment of these soils with a commercially-available phosphate amendment intended to render lead non-leachable, NOAA removed the lead contaminated soils from 0-2 feet bgs and disposed of them at the Track 42, Cell C landfill (TPA 5a) during 2006 (NOAA 2007). Lead contaminated soil remains at depths greater than two-foot bgs at each of the aforementioned sites, except House 102. Subsequently, NOAA restored the sites to grade with clean fill.

IV. Summary

NOAA investigated sixty (60) sites on St. Paul Island, Alaska, conducting contaminated soil removal, debris removal and/or in-situ vegetated capping where necessary. NOAA met applicable ADEC cleanup levels to the extent practicable. Occasionally, contaminated soil was left in place at sites due to equipment limitations and/or the presence of utility lines, buildings, roads, and other structures. Additionally, NOAA was not obligated to excavate petroleum contaminated soils occurring at depths deeper than 15 feet to address the inhalation and ingestion exposure pathways. Contaminated soil remains at some sites.

- DRO remains above applicable site cleanup levels at 19 sites.
- GRO remains above applicable site cleanup levels at 3 sites.
- RRO remains above applicable site cleanup levels at 3 sites.
- Benzene remains above applicable site cleanup levels at 3 sites.
- Toluene remains above applicable site cleanup levels at 2 sites.
- Ethylbenzene remains above applicable site cleanup levels at 2 sites.
- Total xylenes remain above applicable site cleanup levels at 2 sites.
- Lead remains above applicable site cleanup levels at 3 sites.

Buried debris, such as asbestos-containing material, construction and demolition wastes, and municipal solid waste remain at six sites.

V. References

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels. Contaminated Sites Program*. July 17.

ADEC. 2000. *Risk Assessment Procedures Manual*. June 8.

ADEC. 2002. *Cumulative Risk Guidance*. November 7.

ADEC. 2004. Letter from Louis Howard of ADEC to John Lindsay of the National Oceanic and Atmospheric Administration (NOAA) transmitting comments for a NOAA characterization report submitted for Telegraph Hill Two-Party Agreement Site 15, St. Paul Island, Alaska. August 24.

ADEC. 2006. *Title 18 of the Alaska Administrative Code (18 AAC) 75, Articles 3 and 9. Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. As amended through December 30, 2006.

Alaska Department of Natural Resources (ADNR). 2006. *Commissioner's Order and Record of Decision Concerning the Creation of a Critical Water Management Area with Respect to the Groundwater Aquifer Located Under the Town Site of the City of St. Paul*. April 5.

Bristol Environmental Services Corporation (BESC). 1997. UST Removal and Closure Report, St. Paul Island, Alaska, 300 Gallon UST, Facility Identification Number 3048, UST Number 7. September 24.

Columbia Environmental Sciences, Inc. (CESI). 2000. *Letter Report on Parcel 6f/ATCO Investigation*. September 12.

CESI. 2001a. *Final Interim Removal Action Report. St. Paul Island, AK, Southwest Point Battery Site*. Version 2.0. March 15.

CESI. 2001b. *Draft Site Characterization Report. Tract 46 and Vicinity (TPA Site 9), Saint Paul Island, Alaska*. Version 1.6, May 3 and Version 2.1, December 16.

CESI 2001c. *Draft Building Assessment Report, Combine Shop, St. Paul Island, Alaska*. Version 2.0. May 29.

CESI. 2002. Site Characterization Report. Oil Drum Dump Site (TPA Site 1), Saint Paul Island, Alaska. May.

IT Alaska, Inc. (IT Alaska). 2001. *Windmill Wells Water Sampling Effort, St. Paul Island, Alaska*. Letter report to John Lindsay, NOS/NOAA/Pribilof Project Office. October 1.

Mitretek Systems. 2002. *Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska*. June 5.

National Oceanic and Atmospheric Administration (NOAA). 1984. *Transfer of Property on the Pribilof Islands: Descriptions, Terms and Conditions*. February 10.

NOAA. 1996. *Pribilof Islands Environmental Restoration Two-Party Agreement, Attorney General's Office File No. 66-1-95-0126*. January 26.

NOAA. 2003. Record of e-mail originating from Greg Gervais, NOAA Pribilof Project Office, sent on October 14, 2003 and responded to by Louis Howard of ADEC on the same day.

NOAA. 2004a. *Corrective Action Report. Removal of Transite Fragments at Tract 50, St. Paul Island, Alaska, Final Report*. April 2.

NOAA. 2004b. *Final Site Characterization Report. Oil Drum Dump Site (Two-Party Agreement Site No. 1 and Formerly Used Defense Site B-1), Pribilof Islands Environmental Restoration Project, St. Paul Island, Alaska*. November.

NOAA. 2004c. *Final Site Characterization Report. Telegraph Hill Scoria Pit Site, Two-Party Agreement Site No. 15-1, Pribilof Islands Environmental Restoration Project, St. Paul Island, Alaska*. December.

NOAA. 2004d. *Final Corrective Action Plan, Sites 34 and 35, Two-Party Agreement Sites 13a and 13b, Diesel Seep Site (Uplands and Channel), St. Paul Island, Alaska*. June 23.

NOAA. 2005a. *Final Long-term Groundwater Monitoring Plan, St. Paul Island, Alaska. Pribilof Islands Environmental Restoration Project, St. Paul Island, Alaska*. August 29.

NOAA. 2005b. *Final Corrective Action Report. Site 2/TPA Site 2 – Vehicle Boneyard, St. Paul Island, Alaska*. February 24.

NOAA. 2005c. *Final Corrective Action Report. Sites 34 and 35/TPA Sites 13a and 13b – Salt Lagoon Diesel Seep, St. Paul Island, Alaska*. October 19.

NOAA. 2005d. *Technical Memorandum, June 2004 Kerosene Spill, Headstart Building/Electrical Shop, St. Paul Island, Alaska (ADEC spill #04259916301)*. June 2.

NOAA. 2005e. *Final Corrective Action Report. Icehouse Lake (Site 36/TPA Site 14), St. Paul Island, Alaska*. May 24.

NOAA. 2005f. *Final Corrective Action Report. Polovina Hill Stockpile, St. Paul Island, Alaska*. Prepared by NOAA, Pribilof Project Office, Seattle, WA with Bering Sea Eccotech, Inc. Contract No. 50ABNC100043. January 4.

NOAA. 2005g. *The History of Parcel 6f, the ATCO Building, and the Windmill Wells on St. Paul Island, Alaska as it Relates to Soil and Groundwater Cleanup Needs and Responsibilities*. June.

NOAA. 2005h. *Final Corrective Action Report. Tract 50 Drum Platform Foundation – Site 58, St. Paul Island, Alaska*. July 6.

NOAA. 2006a. *Corrective Action Report. Connector Building Demolition*. St. Paul Island, Alaska. May 8.

NOAA. 2006b. *Technical Memorandum, Characterization Soil Sample Collection at the Former Big Polovina Hill Debris Pile*. January 3.

NOAA. 2007. *Corrective Action Report/Conditional Closure Request, NOAA Site 60/Non-TPA – Lead Contaminated Soils*. St. Paul Island, Alaska. February 7.

NOAA. 2008a. *Corrective Action Report [Conditional Closure Request], Decommissioned Power Plant Demolition and Contaminated Soil Removal, NOAA Site 18/TPA Site 9c, St. Paul Island, Alaska*, March 28, 2008.

NOAA. 2008b. *Corrective Action Report and Conditional Closure Request, Municipal Garage Demolition and Contaminated Soil Removal, NOAA Site 20/TPA Site 9e, St. Paul Island, Alaska*, March 28, 2008.

NOAA and Bering Sea Eccotech, Inc. (BSE). 2004a. *Corrective Action Report, St. Paul Island, Alaska, TPA Site 9a – Old Movie Theatre. Final Report*. February 5.

NOAA and BSE. 2004b. *Corrective Action Report, TPA Site 9b – Former Power Plant, St. Paul Island, Alaska, Final Report*. February 5.

NOAA and BSE. 2004c. *UST Removal and Corrective Action Report, TPA Site 9q – House 101, St. Paul Island, Alaska, Final Report*. February 9.

NOAA and BSE. 2004d. *UST Removal and Corrective Action Report, TPA Site 9s – House 103, St. Paul Island, Alaska, Final Report*. February 9.

NOAA and BSE. 2004e. *UST Removal and Corrective Action Report. TPA Site 9h – Former Alaska Dormitory, St. Paul Island, Alaska, Final Report*. February 12.

NOAA and BSE. 2004f. *Final Corrective Action Report. TPA Site 9c/Site 18 – Decommissioned Power Plant, St. Paul Island, Alaska*. December 21.

NOAA and Tetra Tech EM Inc. (Tetra Tech). 2005. *Closure Report. Site 5/TPA Site 5a – St. Paul Landfill Cell C (Tract 42), St. Paul Island, Alaska*. September 19.

Nortech Environmental & Engineering Consultants (Nortech). 2001a. *Site Closure Report – Final. Dune Vehicle Boneyard (Two-Party Agreement Site 4), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. June 6.

Nortech. 2001b. *Site Closure Report – Final. Pumphouse Lake (Two-Party Agreement Site 6), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. June 6.

Nortech. 2001c. *Site Closure Report – Draft. NMFS Fuel Barges: A, B, C, and D (Two-Party Agreement Site 7), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. November 19.

Nortech. 2001d. *Site Closure Report – Draft. NOAA Landfill: Cliffside Dump and Reef Point Shoreline Site (Two-Party Agreement Site 8), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. November 21.

Nortech. 2001e. *Site Salvage and Demolition Report-Draft Boxing/Barreling Shed Cleanup, Historical Items Salvage and Demolition (Two-Party Agreement Site 9, Tract 46), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. May 23, 2001.

Nortech. *2001f. Site Closure Report – Draft. Telegraph Hill Scoria Pit Debris Site (Two-Party Agreement Site 15), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. April 23.

Nortech. 2001g. *Site Closure Report – Final. Former Aleut Bunkhouse (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. June 6.

Nortech. 2001h. *Site Closure Report – Final. Abandoned Bulldozer (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. June 6.

Nortech. 2001i. *Site Closure Report – Final. Concrete Storage Bunker – Explosives Discovery & Demolition (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. June 6.

Nortech. 2001j. *Site Closure Report – Draft. Salt Lagoon Drum Removal Site (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. November 29.

Nortech. 2001k. *Site Closure Report – Draft. Big Polovina Hill Debris Staging Area (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. May 2.

Nortech. 2001l. *Site Cleanup Report – Final. Former Southwest Point LORAN Station Site (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. June 6.

Nortech. 2001m. *Debris Removal Report – Final. Former Blubber Dump (Non Two-Party Agreement Site), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. June 6.

Tetra Tech. 2000a. *Soil Background Study. Pribilof Islands Site Restoration, St. Paul Island, Alaska*. December.

Tetra Tech. 2000b. *Site Characterization Report. Oil Drum Dump Site (Two-Party Agreement Site No. 1), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. December.

Tetra Tech. 2000c. *Closure Confirmation Report, Little Polovina Hill Vehicle Boneyard (Two-Party Agreement Site No. 3), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. December 18.

Tetra Tech. 2000d. *Closure Confirmation Report. Dune Vehicle Boneyard (Two-Party Agreement Site No. 4), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. November 20.

Tetra Tech. 2000e. *Closure Confirmation Report. Cliffside Landfills (Two-Party Agreement Site No. 8), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. December 18.

Tetra Tech. 2000f. *Site Characterization Report. Former Gasoline Tank Farm (Two-Party Agreement Site No. 10), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. November 20.

Tetra Tech. 2000g. *Final Closure Confirmation Report. Telegraph Hill, Ridge Wall, and Lake Hill Scoria Pits (Two-Party Agreement Site No. 15), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. December 18.

Tetra Tech. 2004a. *Final Corrective Action Report. Site 19/TPA Site 9d--Decommissioned Power Plant Annex, Site 51/TPA Site 9p – West Dock Fuel Transfer Facility, St. Paul Island, Alaska*. August 2.

Tetra Tech. 2004b. *Final Corrective Action Report. Site 27/TPA Site 9l – Old Sealing Plant/Barreling Shed, St. Paul Island, Alaska*. September 3.

Tetra Tech. 2004c. *Final Corrective Action Report. Site 54/TPA Site 9r – Tract A House 102, St. Paul Island, Alaska*. September 3.

Tetra Tech. 2004d. *Final Corrective Action Report. Site 22/TPA Site 9g – Former Fouke Bunkhouse, St. Paul Island, Alaska*. September 8.

Tetra Tech. 2004e. *Final Corrective Action Report. Site 50/TPA Site 9o – Former Gasoline/Diesel Drum Storage Area, St. Paul Island, Alaska*. September 8.

Tetra Tech. 2004f. *Final Corrective Action Report. Site 20/TPA Site 9e – Municipal Garage/Machine Shop, St. Paul Island, Alaska*. October 22.

Tetra Tech. 2004g. *Final Corrective Action Report. Site 26/TPA Site 9k – AST Saddles Complex, St. Paul Island, Alaska*. October 22.

Tetra Tech. 2004h. *Final Corrective Action Report. Site 30/TPA Site 11 – Former Diesel Tank Farm, St. Paul Island, Alaska*. October 22.

Tetra Tech. 2004i. *Final Closure Report. Blubber Dump/Enhanced Thermal Conduction Soil Treatment Facility, St. Paul Island, Alaska*. October 22.

Tetra Tech. 2004j. *Final Corrective Action Report. Site 25/TPA Site 9j – Five Car Garage and Anderson Building, St. Paul Island, Alaska*. October 28.

Tetra Tech. 2004k. *Final Closure Report. Site 6/TPA Site 5b – St. Paul Landfill Cell A, Site 7/TPA Site 5c – St. Paul Landfill Cell B (Drum Dump), Site 8/TPA Site 5d – St. Paul Landfill Cell B (Solid Waste), St. Paul Island, Alaska*. November 30.

Tetra Tech. 2005a. *Final Corrective Action Report. Site 24/TPA Site 9i – Duplex Building and Former E-Shop, St. Paul Island, Alaska*. January 7.

Tetra Tech. 2005b. *Final Corrective Action Report. Site 21/TPA Site 9f – Cascade Building, St. Paul Island, Alaska*. February 22.

Tetra Tech. 2005c. *Final Corrective Action Report. Site 33/TPA Site 12c – Lukanin Bay PCS Site, St. Paul Island, Alaska*. April 18.

Tables and Figures

Table 1. Method One Table A1 Cleanup Levels for Petroleum-Contaminated Soil (ADEC 2003)[a]

Matrix Score for each Category	Gasoline Range Organics (GRO) (mg/kg)	Diesel Range Organics (DRO) (mg/kg)	Residual Range Organics (RRO) (mg/kg)
Category A: More than 40	50	100	2000
Category B: More than 26 to 40	100	200	2000
Category C: More than 21 to 26	500	1000	2000
Category D: Less than 21	1000	2000	2000

a Note that benzene, toluene, ethylbenzene, and xylenes are also regulated.

Table 2. Method Two Tables B1 and B2 and Ten Times Rule Alternative Cleanup Levels for Select Petroleum Contaminants (ADEC 2003)[a, b]

Analyte	Method Two Cleanup Level (mg/kg)	Alternative Cleanup Level (mg/kg)
Gasoline Range Organics (GRO)	300	1,400[c]
Diesel Range Organics (DRO)	250	2,500[c]
Residual Range Organics (RRO)	10,000	N/A
Benzo(a)anthracene	6	N/A
Benzo(b)fluoranthene	11	N/A
Benzo(k)fluoranthene	110	N/A
Benzo(a)pyrene	1	N/A
Chrysene	620	N/A
Dibenzo(a,h)anthracene	1	N/A
Fluorene	270	N/A
Indeno(1,2,3-c,d)pyrene	11	N/A
Naphthalene	43	N/A
Benzene	0.02	0.5[d]
Ethylbenzene	5.5	55[c]
Toluene	5.4	54[c]
Total Xylenes	78	N/A
Lead	400/1,000[e]	N/A

a ADEC Method Two Tables B1 and B2 (18 AAC 75.341(c)) have three zone subcategories. St. Paul Island falls in the "Under 40 Inch" annual precipitation subcategory.

b Within the zone subcategories, ADEC Method Two Tables B1 and B2 specify cleanup levels for the ingestion, inhalation, and migration to groundwater pathways. NOAA has applied the most stringent cleanup level among the pathways.

c ADEC approved the use of alternative cleanup levels under 18 AAC 75.345 and 18 AAC 75.350, commonly referred to as the Ten Times Rule.

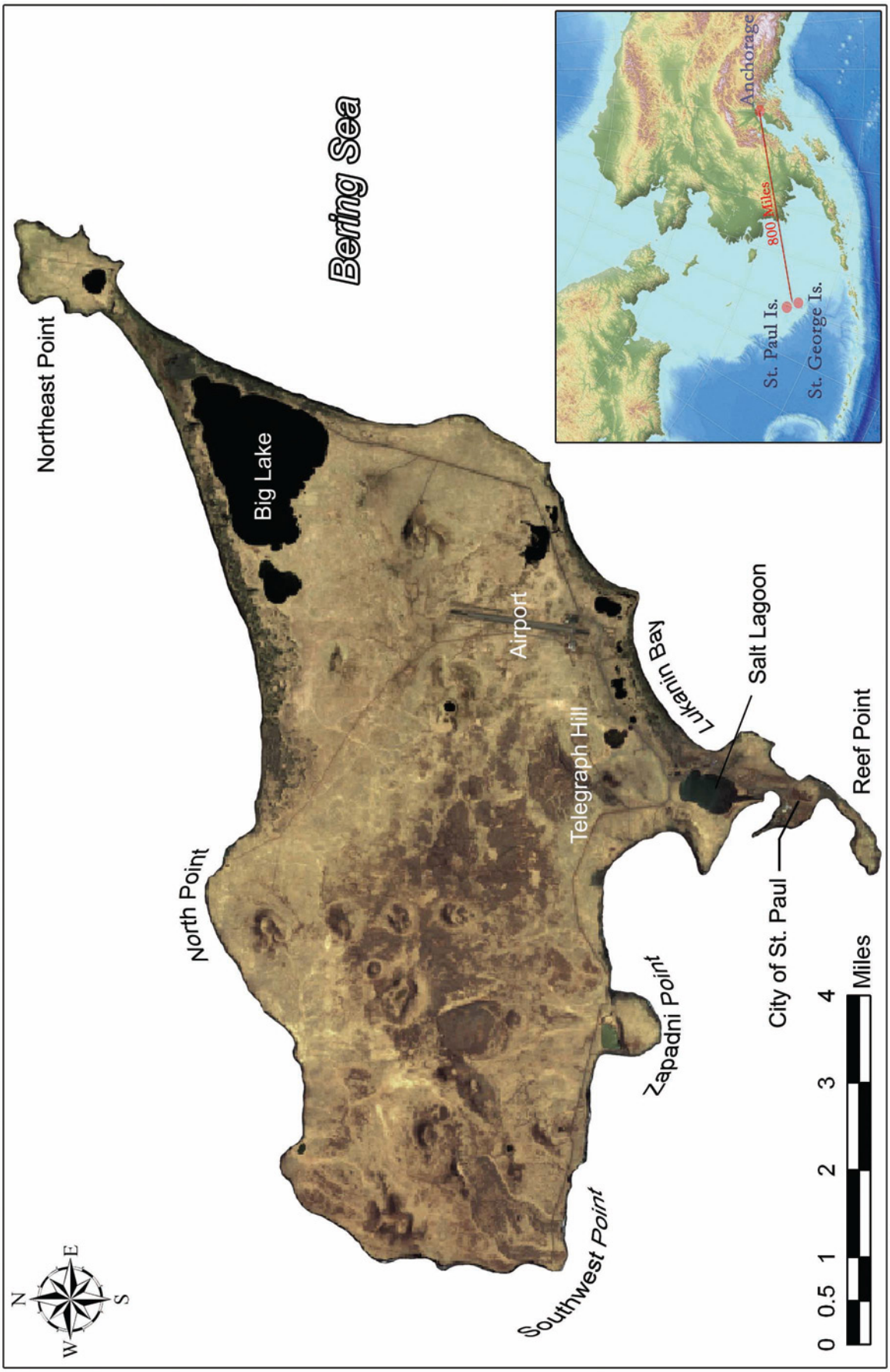
d Under the Two Party Agreement, NOAA was allowed to follow the 1991 regulations regarding cleanup levels (*i.e.*, 0.5 mg/kg benzene), though NOAA strove to meet the current cleanup levels (*i.e.*, 0.02 mg/kg benzene).

e According to the notes to Method Two Tables B1 and B2, the soil cleanup level for lead is 400 mg/kg for residential land use; for commercial or industrial land use, the level is 1,000 mg/kg. NOAA has generally applied the more stringent residential land use cleanup level for lead.

Table 3. Summary of Residual Soil Contamination and Buried Debris at NOAA Cleanup Sites on St. Paul Island, Alaska

Site No.	TPA Site No.	Site Name	Residual Petroleum Compounds	Residual Heavy Metals	Buried Debris
1	1	Oil Drum Dump	DRO, RRO		
2	2	Vehicle Boneyard			Asbestos-containing material, construction and demolition debris, and automotive parts.
3	3	Little Polovina Boneyard			
4	4	Dune Vehicle Boneyard			
5	5a	St. Paul Landfill Cell C	PCS cap		Municipal solid waste
6	5b	St. Paul Landfill Cell A	DRO, RRO		Construction and demolition debris, municipal solid wastes, and potential barrels containing used oil
7	5c	St. Paul Landfill Cell B Drum Dump	DRO, RRO		
8	5d	St. Paul Landfill Cell B Solid Waste			
9	6	Pumphouse Lake			
10	7a	NMFS Fuel Barge: North End Lagoon			
11	7b	NMFS Fuel Barge: Lagoon Channel			
12	7c	NMFS Fuel Barge: Black Bluff			
13	7d	NMFS Fuel Barge: East Landing			
14/15	8a/8b	NOAA Landfills		Lead	Municipal solid wastes
16	9a	Old Movie Theater			
17	9b	Former Power Plant (Former Post Office)	DRO		
18	9c	Decommissioned Power Plant	DRO, GRO, benzene (above current criterion)		
19	9d	Decommissioned Power Plant Annex	DRO, GRO, benzene (above current criterion)		
20	9e	Machine Shop/Municipal Garage	DRO, GRO, benzene, toluene, ethylbenzene, total xylenes		
21	9f	Old Coal Shed (Cascade Building)	DRO, GRO, benzene, toluene, ethylbenzene, total xylenes		
22	9g	Former Fouke Bunkhouse			
23	9h	Former Alaska Dormitory	DRO		
24	9i	E-Shop/Radio Building and Duplex	DRO,	Lead 2 feet + bgs	
25	9j	Five Car Garage and Anderson Building			
26	9k	AST Saddle Complex	DRO		

Site No.	TPA Site No.	Site Name	Residual Petroleum Compounds	Residual Heavy Metals	Buried Debris
27	9l	Old Sealing Plant			
28	9m	Salt Water Wells			
29	10	Former Gas Tank Farm			
30	11	Diesel Tank Farm	DRO		
31	12a	Lukanin Bay Debris Area A			Potentially buried debris
32	12b	Lukanin Bay Debris Area B			Potentially buried debris
33	12c	Lukanin Bay Petroleum Contaminated Soil			
34/35	13a/13b	Salt Lagoon Diesel Seep	DRO, GRO		
36	14	Icehouse Lake			
37	15a	Scoria Pit – Telegraph Hill			Potentially buried barrels
38	15b	Scoria Pit – Lake Hill			
39	15c	Scoria Pit – Ridge Wall			
40	NTPA	Aleut Bunkhouse			
41	NTPA	Bulldozer in Bog			
42	NTPA	Explosives Storage Bunker			
43	NTPA	Barrels at North End of Salt Lagoon			
44	NTPA	Big Polovina Debris			
45	NTPA	Southwest Point Former LORAN			
46	NTPA	Blubber Dump Debris			
47	NTPA	Petroleum-Contaminated Stockpile			
48	NTPA	Windmill Wells			
49	9n	Gas Station and Garage			
50	9o	Former Gasoline/Diesel Drum Storage	DRO, benzene (above current criterion)		
51	9p	Fuel Transfer Station and Pipeline (Receiving Warehouse)	DRO, benzene (above current criterion)		
52	NTPA	Tract 50 Asbestos in Soil			
53	9q	Tract A Lot 101	DRO	Lead 2 feet + bgs	
54	9r	Tract A Lot 102	DRO		
55	9s	Tract A Lot 103		Lead 2 feet + bgs	
56	NTPA	ATCO/Radio Building Barrel Staging Area	DRO, RRO		
57	NTPA	Tract 46 Sheet Metal Garage			
58	NTPA	Tract 50 Drum Platform Foundation	DRO, benzene (above current criterion)		



Pribilof Islands Restoration Project

Sources: Ikonos Satellite Imagery (Space Imaging 2001)
Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig1_SNP_Standard.psd
Updated: 6/02/2008

Residual Contamination Report
St. Paul Island Vicinity Map
St. Paul Island, Alaska

Figure 1

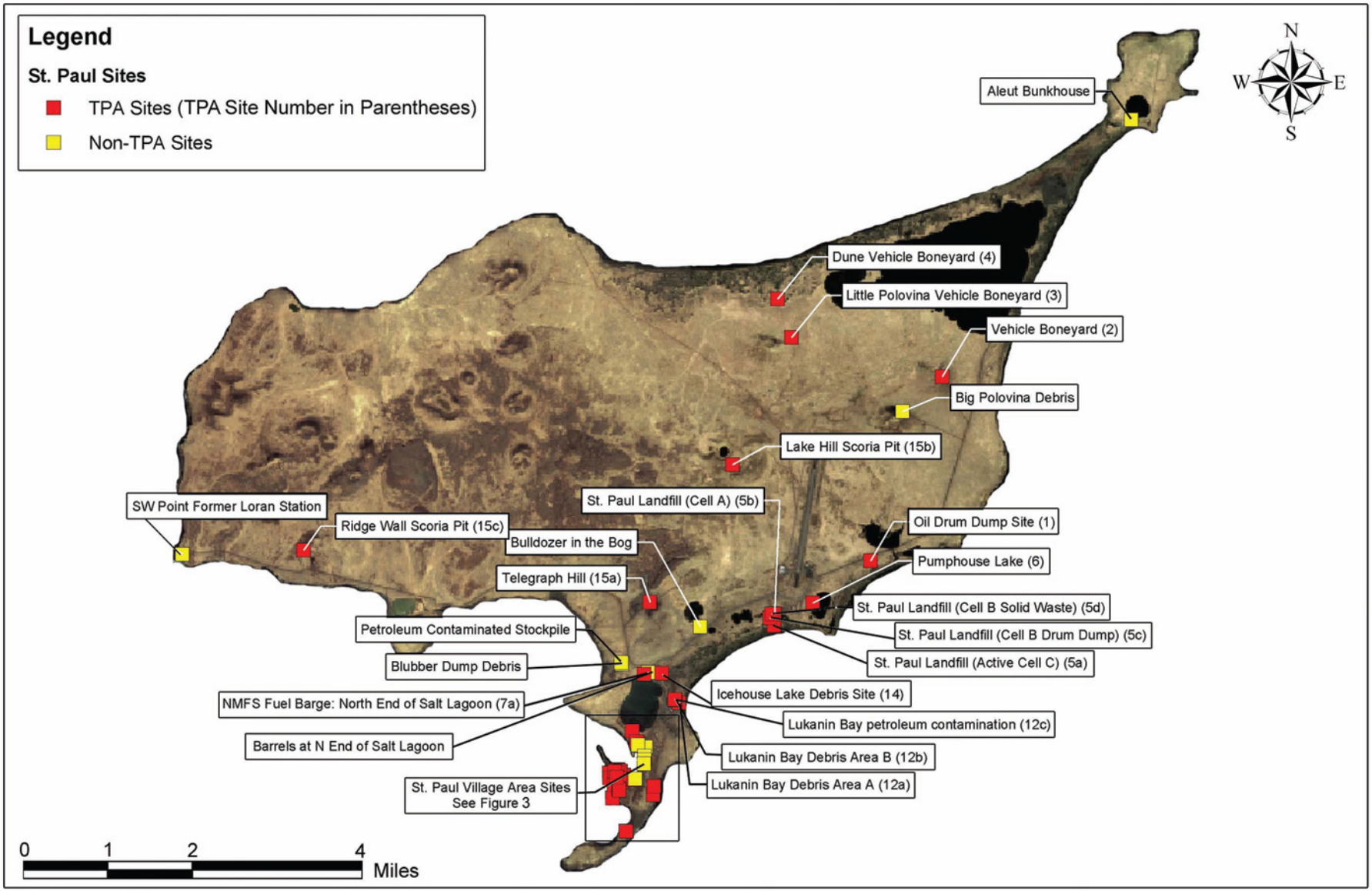


Figure 2

Residual Contamination Report
St. Paul Island Site Locations
St. Paul Island, Alaska

Sources: Ikonos Satellite Imagery (Space Imaging 2001), Pribilof Project GIS Database, 2005.
Path: C:\KP_GIS Data\ Maps & Figures\ SNP\Residual Contamination\ Fig2_Site_Locations.psd
Updated: 6/02/2008

Pribilof Islands Restoration Project

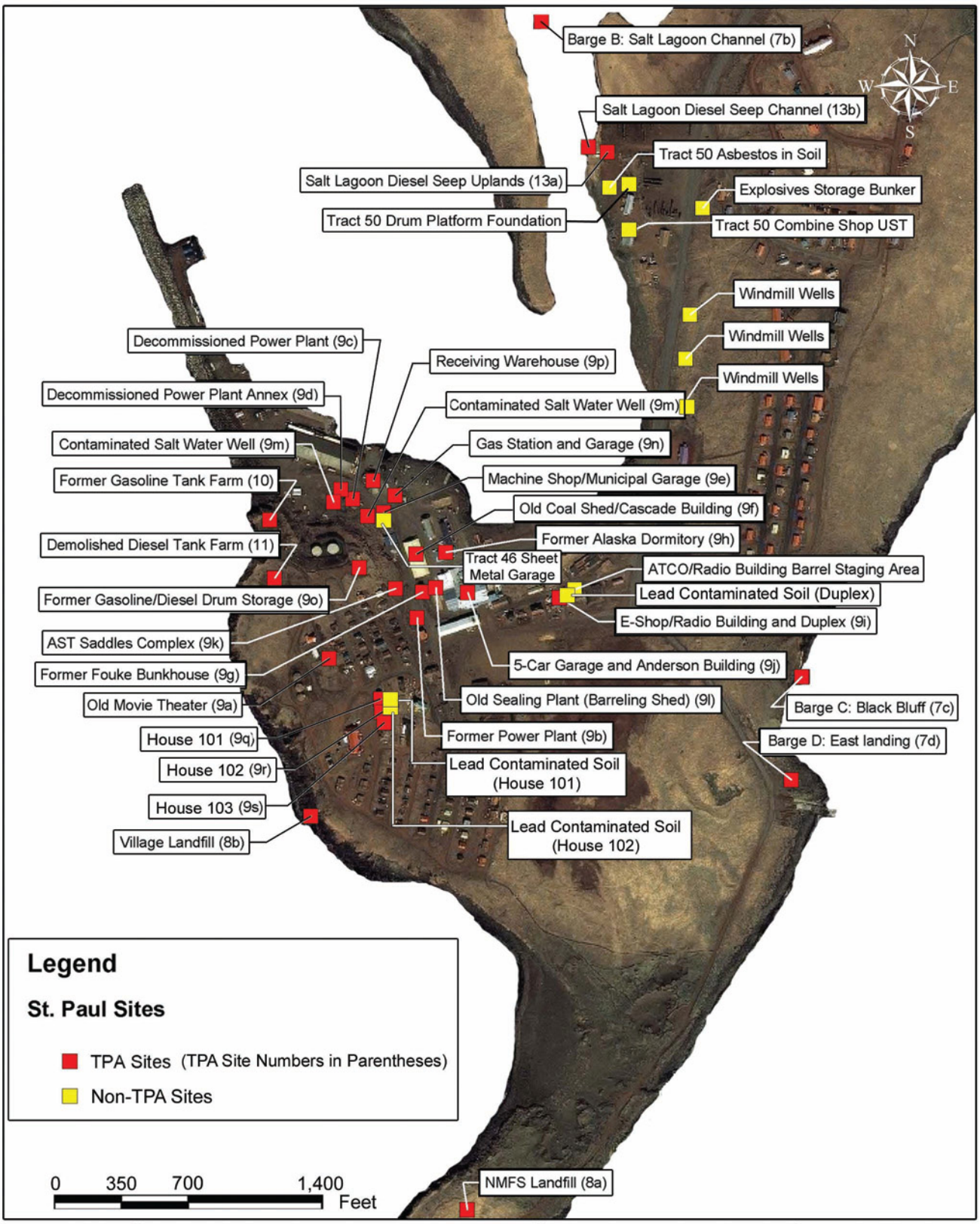


Figure 3

Residual Contamination Report
City of St. Paul Site Locations
St. Paul Island, Alaska

Sources: Ikonos Satellite Imagery (Space Imaging 2001), Pribilof Project GIS Database, 2005.
Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig3_Village_Site_Locations.psd
Updated: 6/02/2008

Pribilof Islands Restoration Project

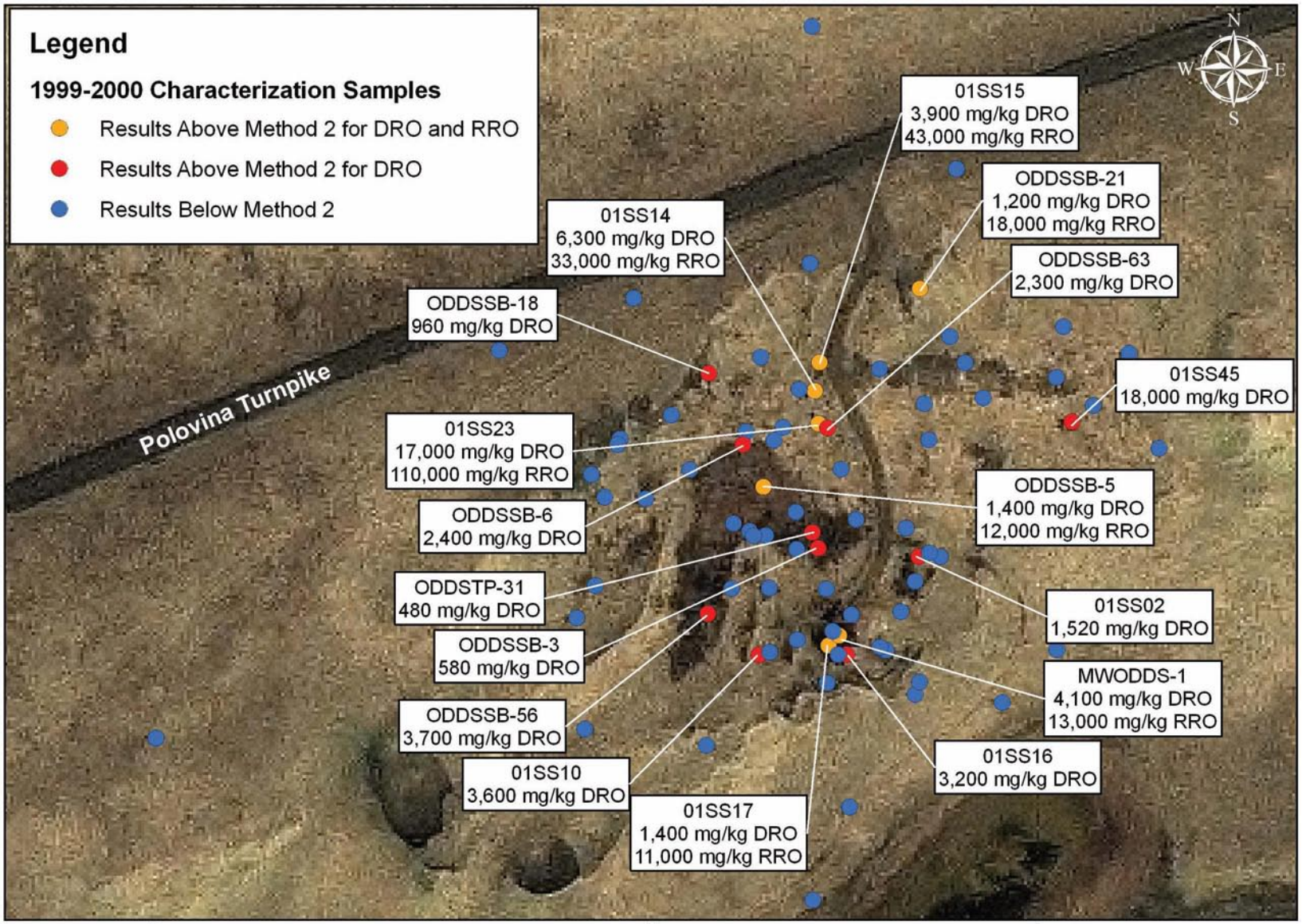


Figure 4

Residual Contamination Report
Oil Drum Dump
Site 1/TPA Site 1
St. Paul Island, Alaska

Sources: Characterization Samples (Pribilof Project Database 2005), Satellite Imagery (Ikonos 2001).
Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig4_Oil_Drum_Dump.mxd
Updated: 6/2/2008 @ 9:23:58 AM

Pribilof Islands Restoration Project

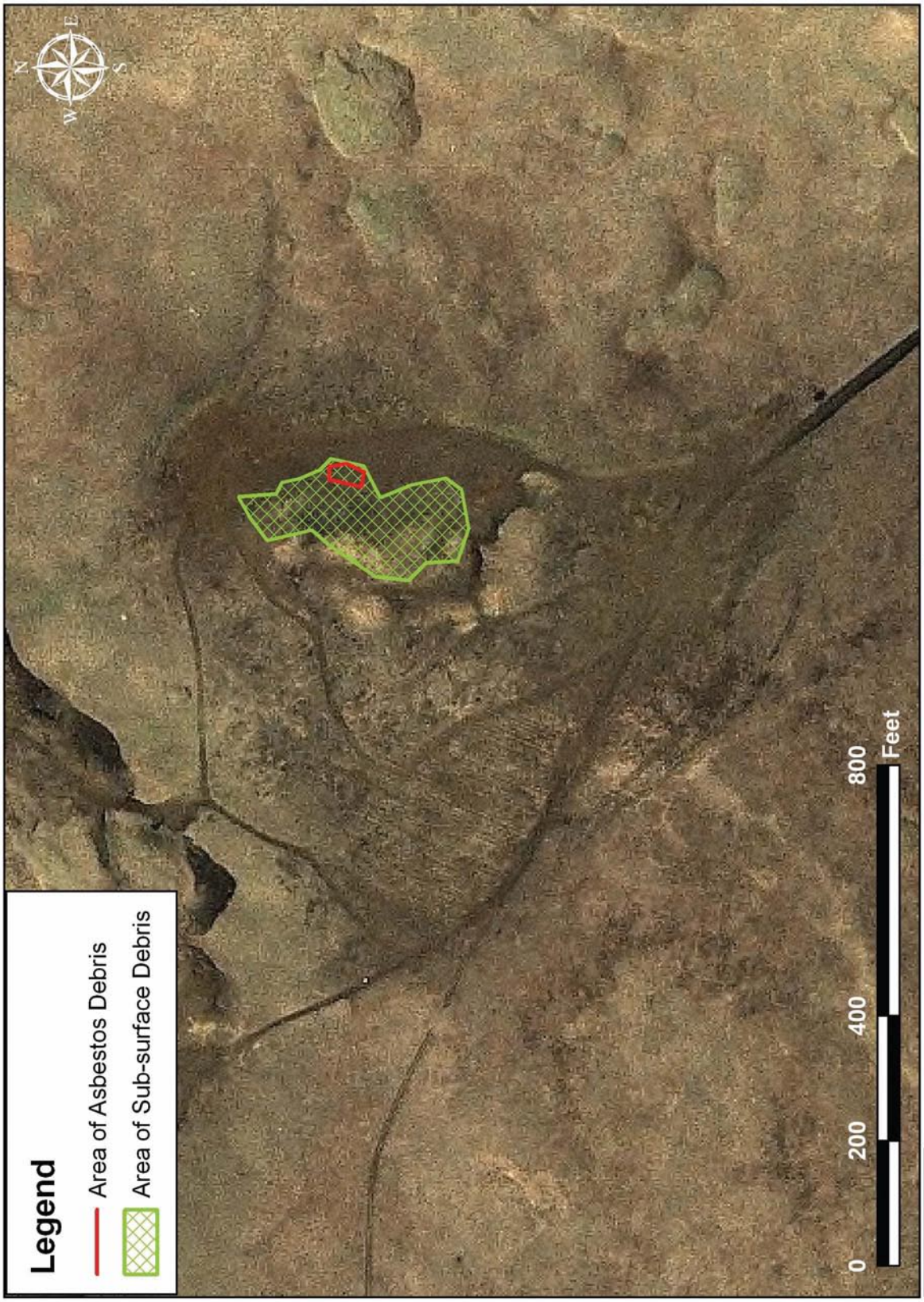


Figure 5

Residual Contamination Report
Vehicle Boneyard
Site 2/TPA Site 2
St. Paul Island, Alaska

Sources: Area of Debris Layers (GIS Pribilof Project Database), Satellite Imagery (Ikonos 2001);
Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig5_Vehicle_Boneyard.mxd
Updated: 6/2/2008 @ 9:25:22 AM

Pribilof Islands Restoration Project

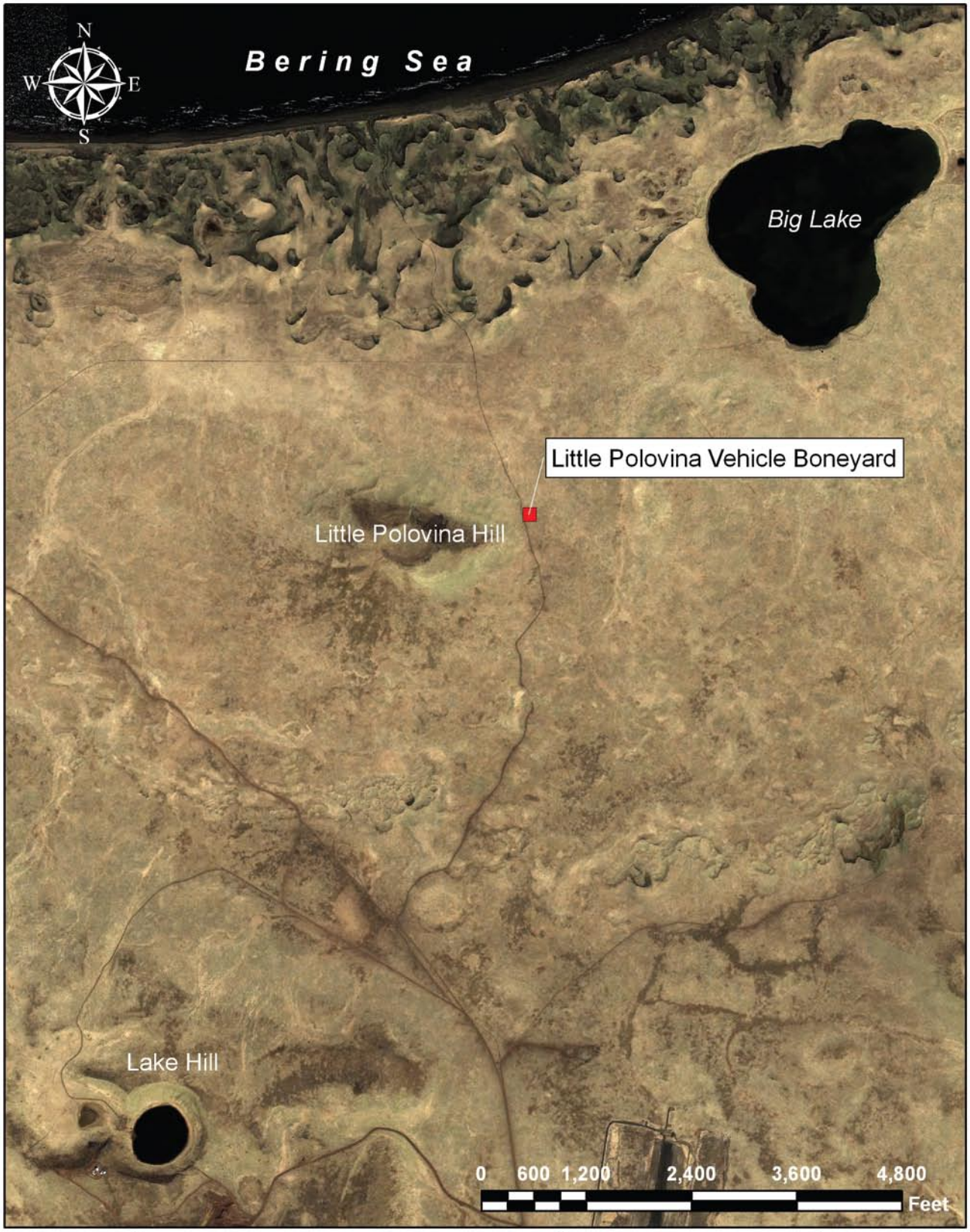


Figure 6	Residual Contamination Report Little Polovina Vehicle Boneyard Site 3/TPA 3 St. Paul Island, Alaska	Sources: Location Point (NOAA Pribilof Project GIS 2007), Satellite Imagery (Ikonos 2001). Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig6_Little_Polovina.mxd Date: 6/2/2008 @ 9:26:41 AM	Pribilof Islands Restoration Project

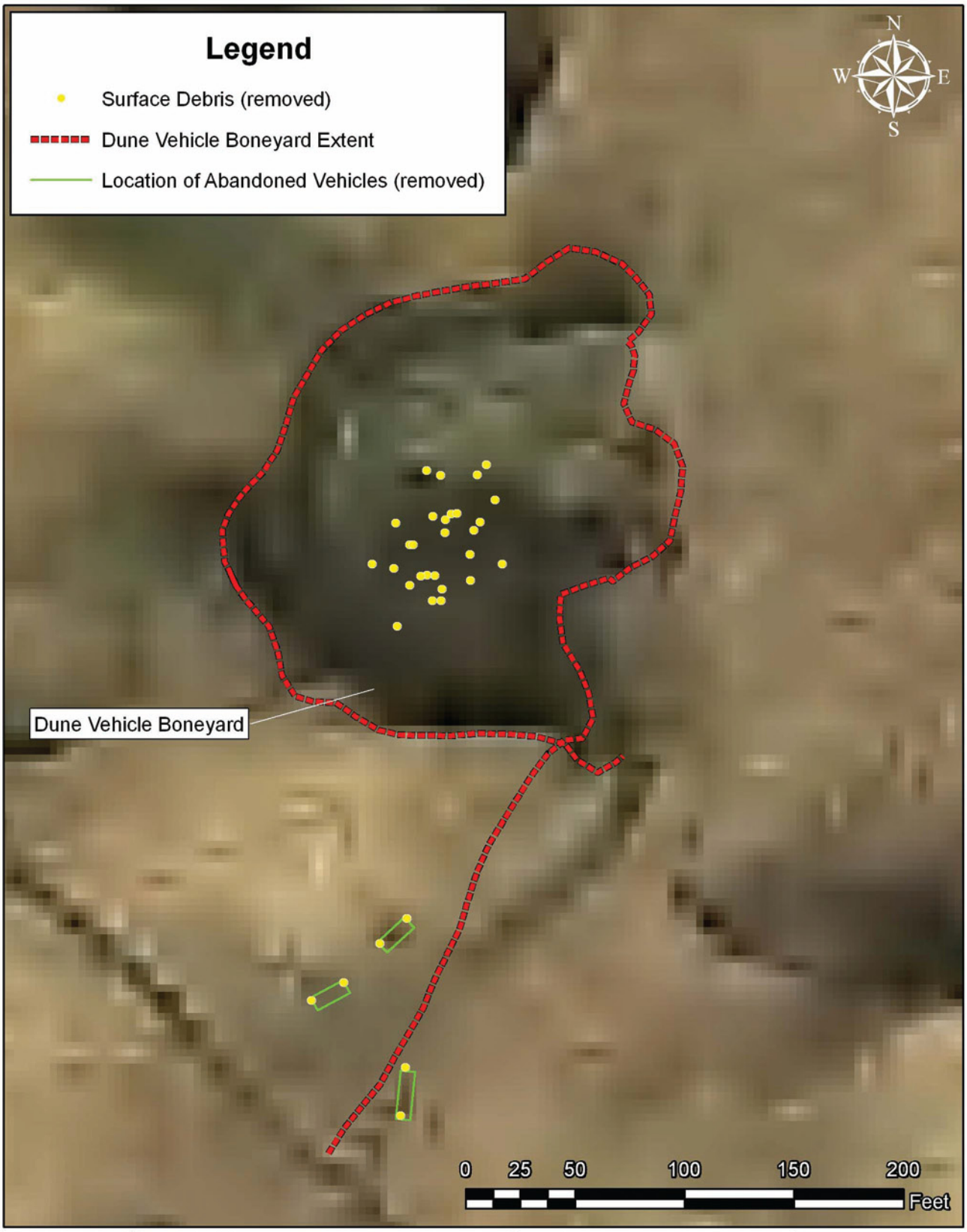


Figure 7	Residual Contamination Report Dune Vehicle Boneyard Site 4/TPA Site 4 St. Paul Island, Alaska	Sources: All layers (NOAA PPO GIS), Satellite Imagery (Ikonos 2001). Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig7_Dune_Boneyard.mxd Date: 6/2/2008 @ 9:33:08 AM	Pribilof Islands Restoration Project

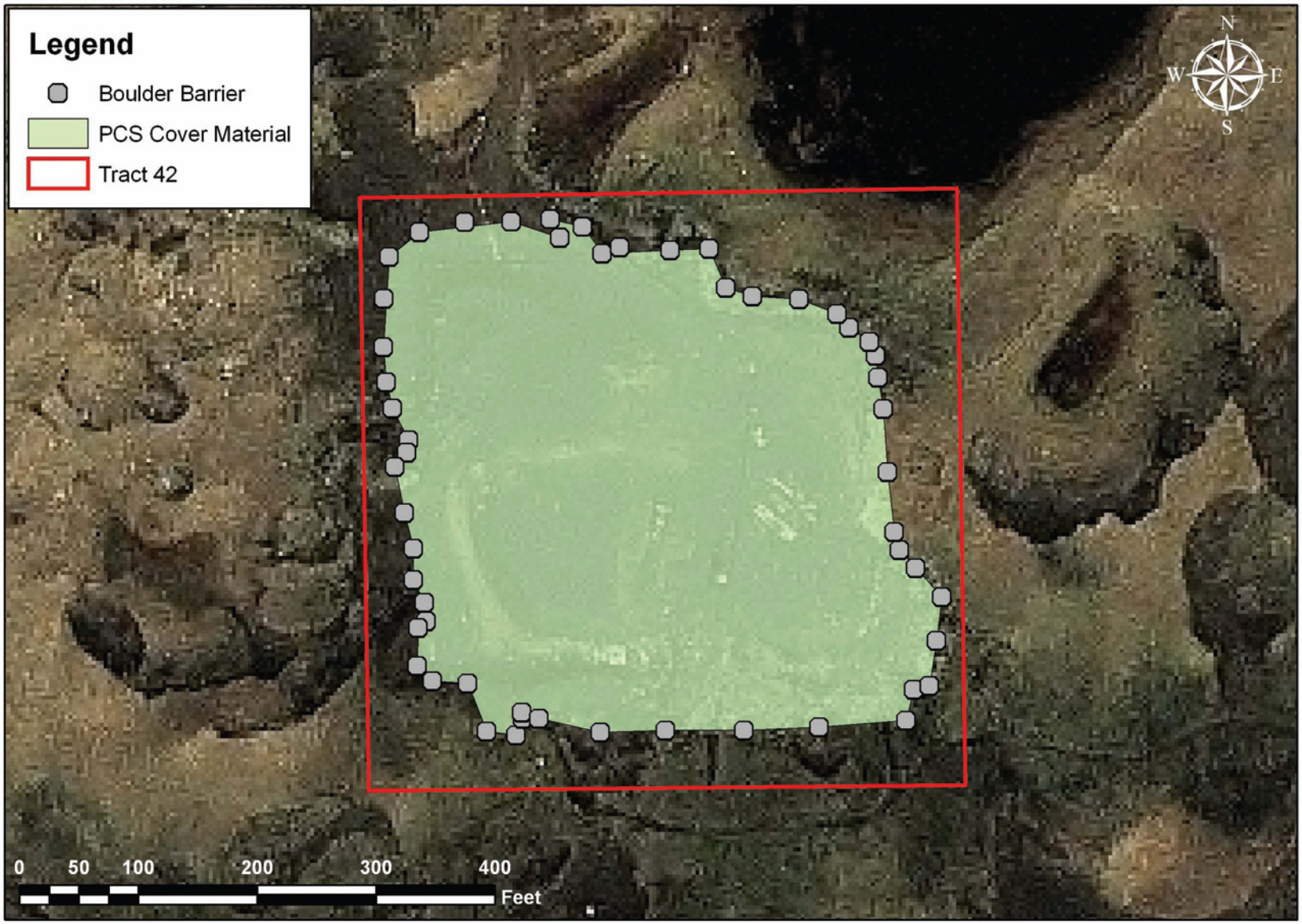


Figure 8	Residual Contamination Report St. Paul Landfill Cell C Site 5/TPA Site 5a St. Paul Island, Alaska	Source: Boulder Barrier & PCS Cover Material (NOAA Pribilof Project GIS 2005), Tract 42 (BLM 1983), Satellite Imagery (Ikonos 2001). Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig8_Cell_C.mxd Updated: 6/2/2008 @ 9:34:17 AM	Pribilof Islands Restoration Project

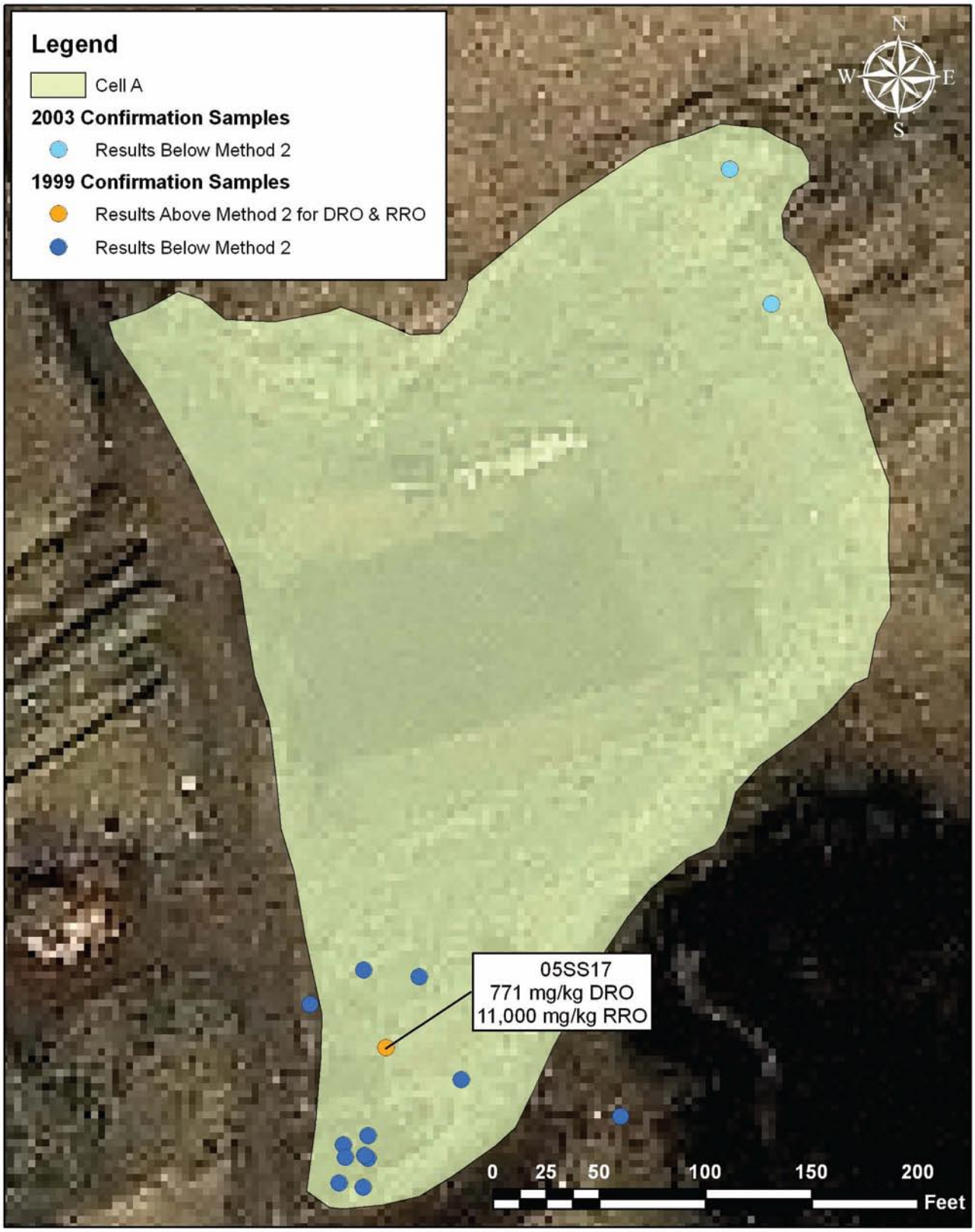


Figure 9	Residual Contamination Report St. Paul Landfill Cell A Site 6/TPA Site 5b St. Paul Island, Alaska	Sources: Cell A and Sampling Locations (NOAA Pribilof Project GIS 2005), Satellite Imagery (Ikonos 2001). Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig9_Landfill_Cell_A.mxd Updated: 6/2/2008 @ 9:35:16 AM	Pribilof Islands Restoration Project

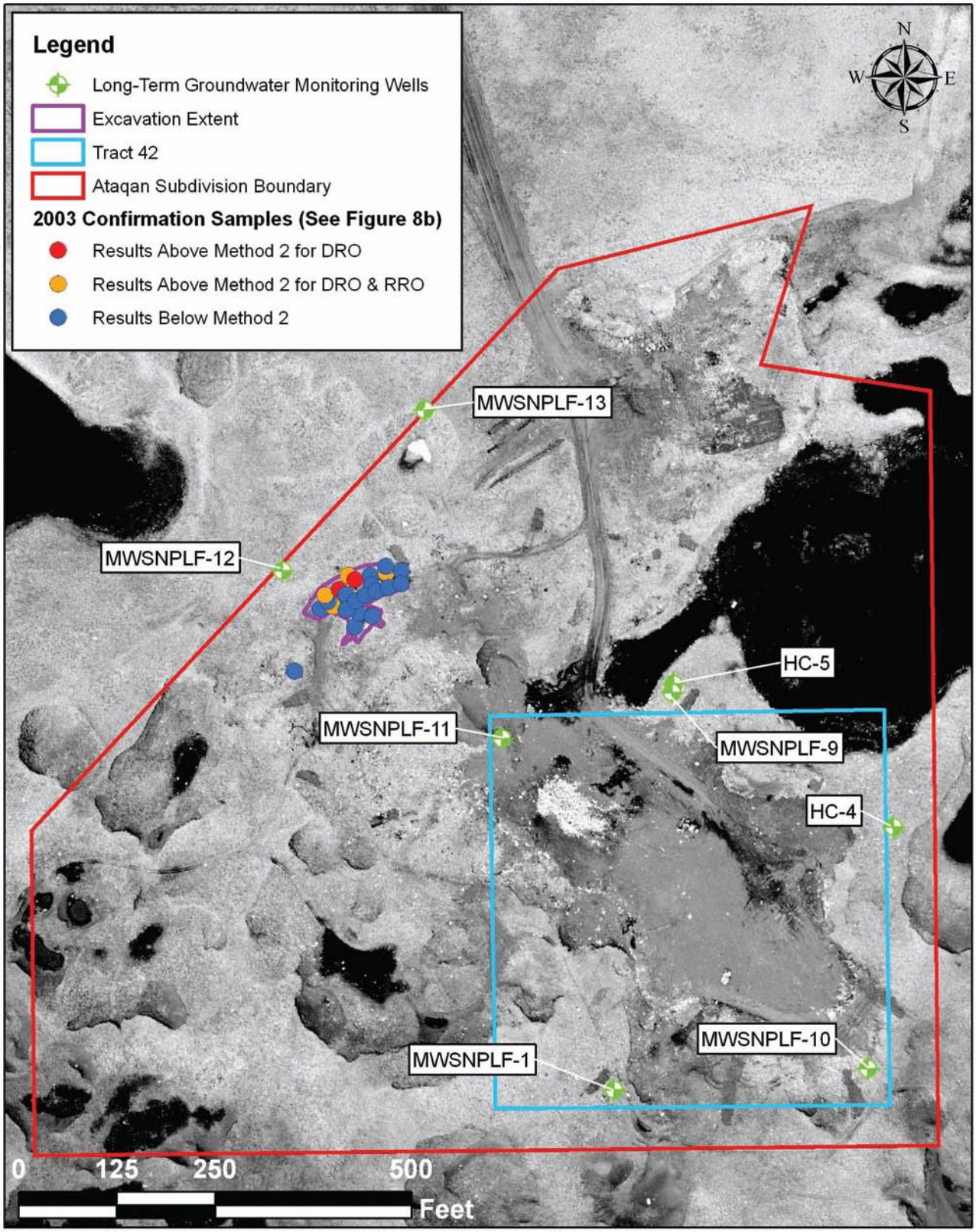


Figure 10a	Residual Contamination Report Long-Term Groundwater Monitoring St. Paul Landfill Cell B Drum Dump Site 7/TPA Site 5c St. Paul Island, Alaska	Sources: Wells, Samples, & Excavation Extent (NOAA GIS 2005), Ataqan Subdivision Boundary (Polarconsult 1997), Tract 42 (BLM 1983), Aerial Photo (Davis 2000). Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig10a_Cell_B_Drum_Dump.mxd Updated: 6/2/2008 @ 9:37:26 AM

Pribilof Islands Restoration Project

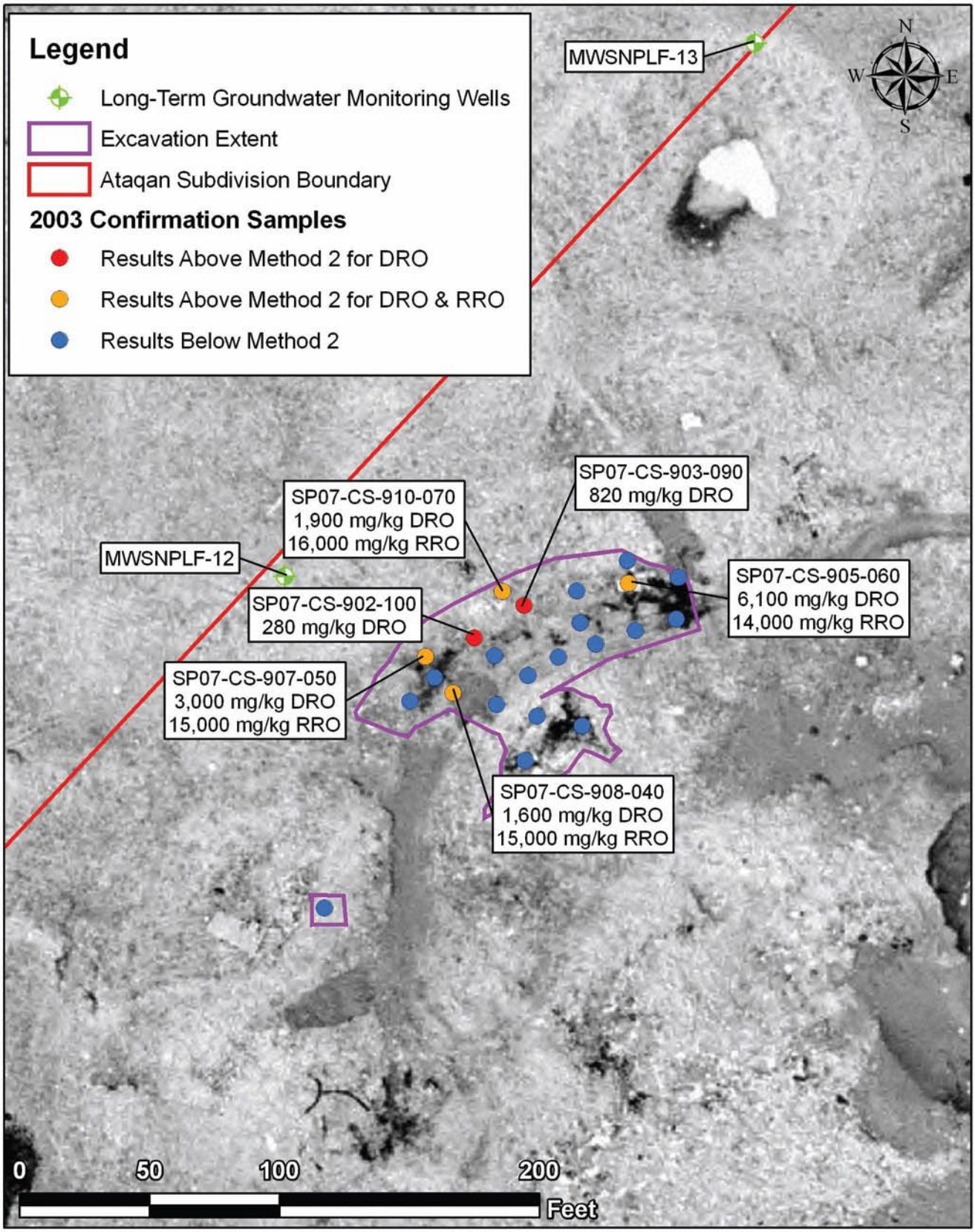


Figure 10b	Residual Contamination Report St. Paul Landfill Cell B Drum Dump Site 7/TPA Site 5c St. Paul Island, Alaska	Sources: Wells and Sample Locations (NOAA 2005), Ataqan Subdivision Boundary (Polarconsult 1997), Aerial Photo (Davis 2000) Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig10b_Cell_B_Drum_Dump.mxd Updated: 6/2/2008 @ 9:38:48 AM

Pribilof Islands Restoration Project

Figure 11	Residual Contamination Report Pumphouse Lake Site 9/TPA Site 6 St. Paul Island, Alaska	Sources: All layers (NOAA GIS), Aero-Metric 2 ft Aerial Photo Path: C:\KP_GIS Data\Maps & Figures\ SNP\Residual Contamination\ Fig11_Pumphouse_Lake.mxd Date: 6/2/2008 @ 9:40:32 AM	Pribilof Islands Restoration Project

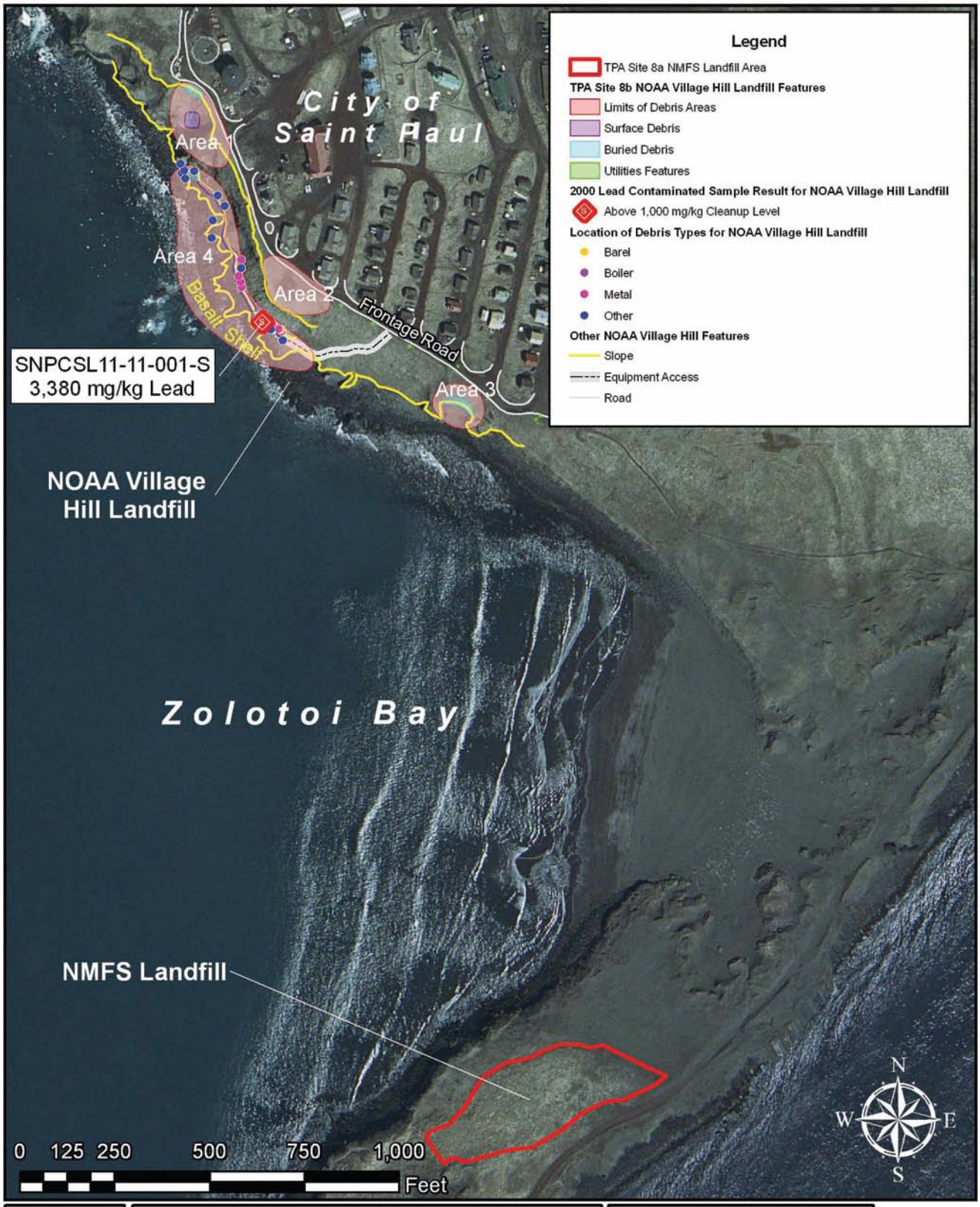


Figure 12	Residual Contamination Report NMFS Landfill & NOAA Village Hill Landfill Site 14 &15/TPA 8a & 8b St. Paul Island, Alaska	Sources: Landfill Features (TTEMI, 1999/2000), Lead Sample (Nortech, 2000), Aero-Metric 2006 2 ft Aerial Photo, Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig12_NOAA_Landfills.mxd Date: 6/2/2008 @ 9:42:34 AM

Pribilof Islands Restoration Project

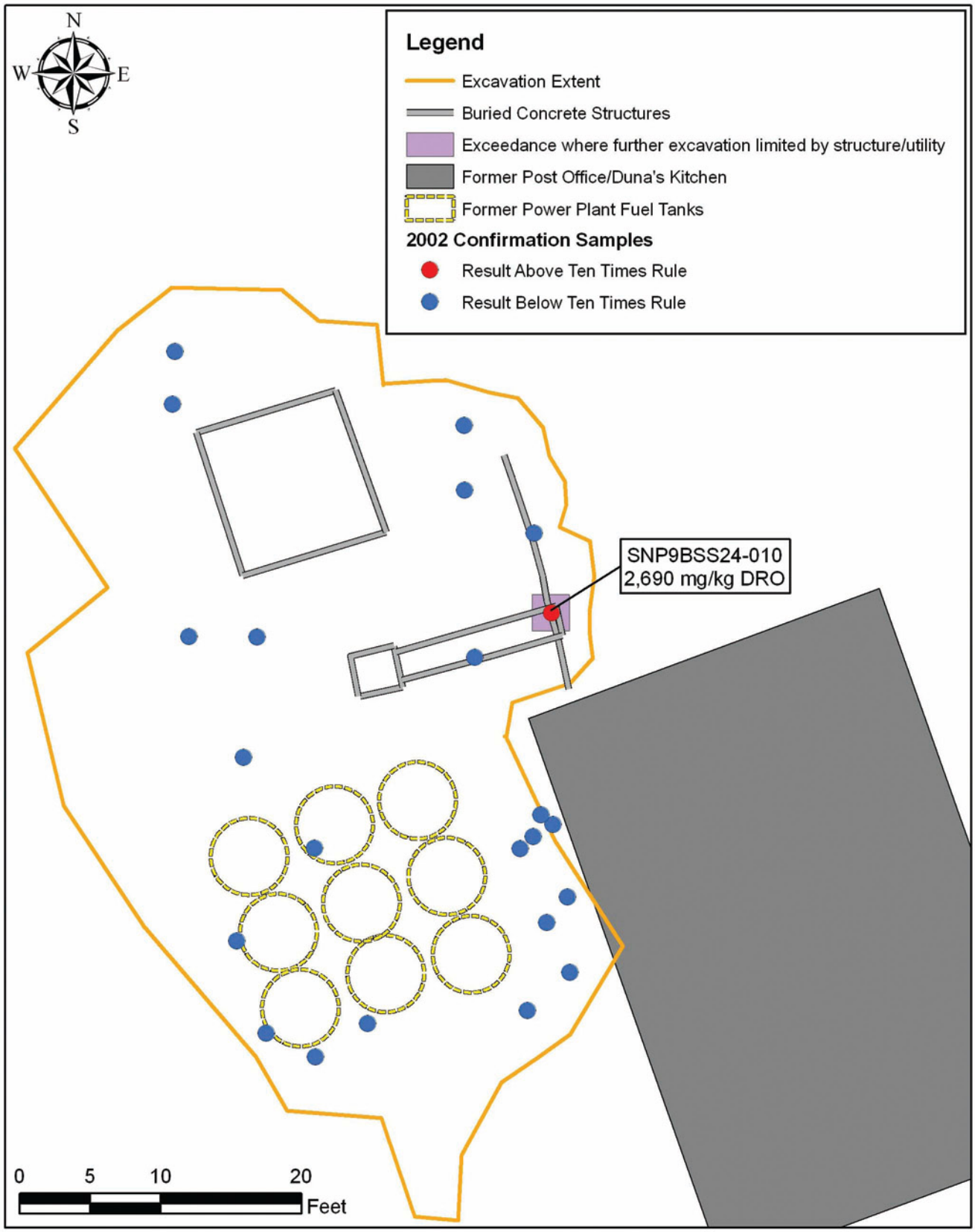


Figure 13	Residual Contamination Report Former Power Plant Site 17/TPA Site 9b St. Paul Island, Alaska	Source: All layers (NOAA Pribilof Project GIS, 2005). Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig13_Former_Power_Plant.mxd Updated: 6/2/2008 @ 9:44:01 AM

Pribilof Islands Restoration Project

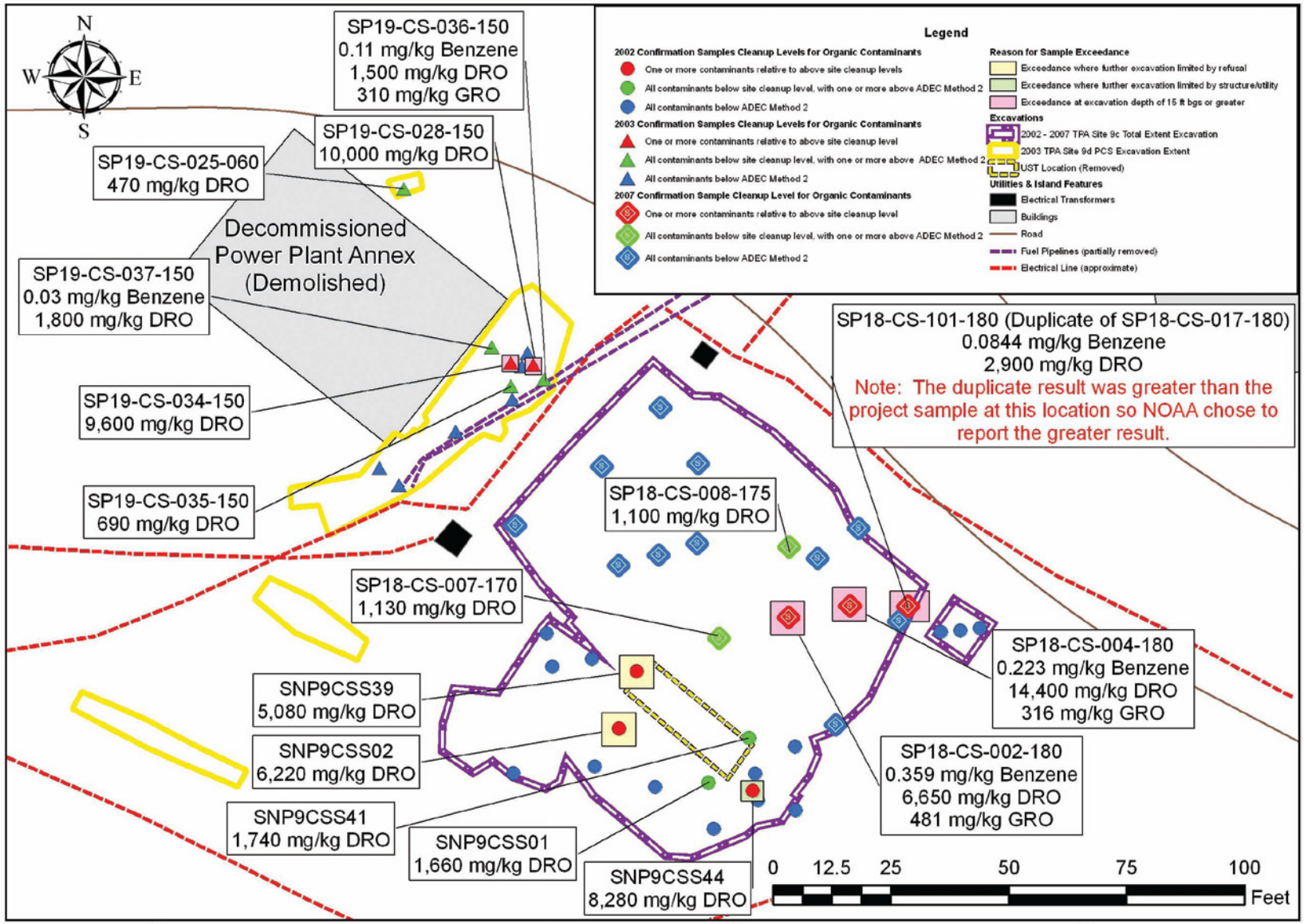


Figure 14

Residual Contamination Report
Decommissioned Power Plant
& Decommissioned Power Plant Annex
Sites 18 & 19/TPA Sites 9c & 9d
St. Paul Island, Alaska

Sources: Building, Excavation Extents, Sample Exceedance, UST & Utilities (NOAA GIS), Samples (Chemical Data '02v3 & '03-'07) Road (Hart Crowser CAD 2001).
Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig14_DPP_&_Annex.mxd
Date: 6/2/2008 @ 9:45:11 AM

Pribilof Islands Restoration Project

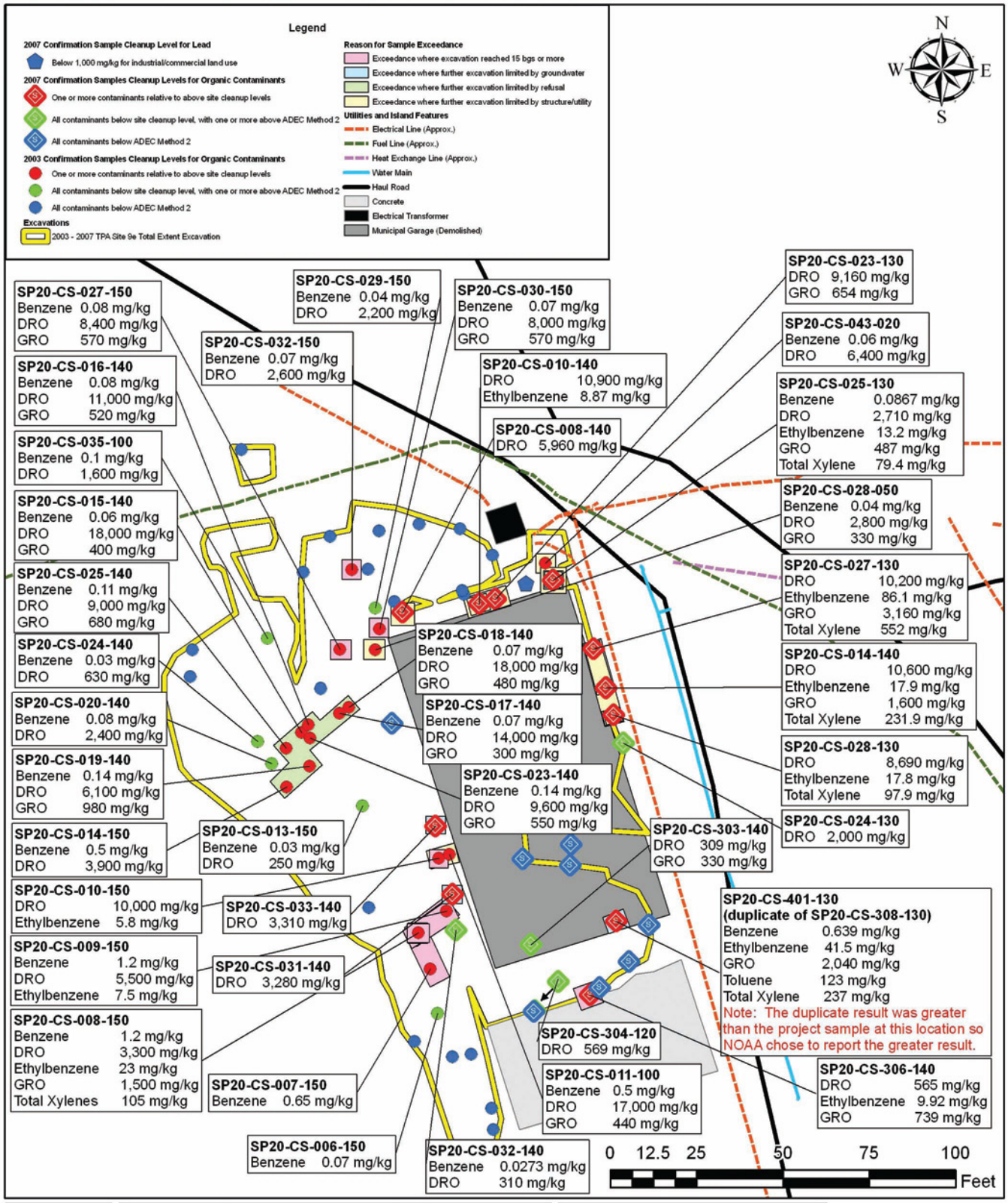


Figure 15

Residual Contamination Report
Municipal Garage Demolition
Site 20/TPA Site 9e
St. Paul Island, Alaska

Sources: NOAA GIS Layers (GIS Database & Chemical Database '03-'07)
Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig15_Municipal_Garage.mxd
Date: 6/2/2008 @ 9:46:09 AM

Pribilof Islands Restoration Project

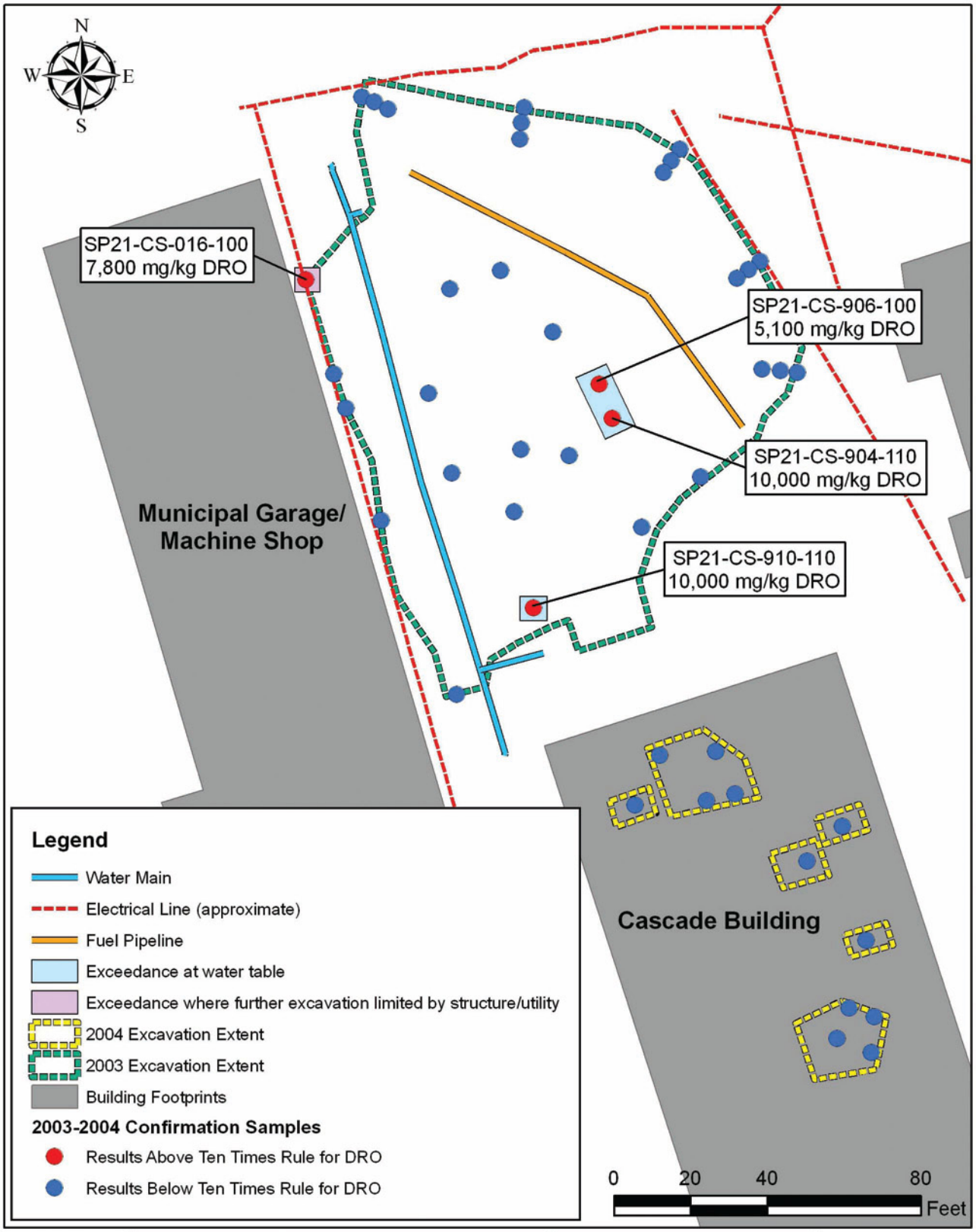


Figure 16a	Residual Contamination Report DRO Cascade Building Site 21/TPA Site 9f St. Paul Island, Alaska	Source: All layers (NOAA Pribilof Project Office, 2005), Samples ('03-'04 Chemical Database) Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig16a_CascadeBldg_DRO.mxd Updated: 6/2/2008 @ 10:06:55 AM	Pribilof Islands Restoration Project

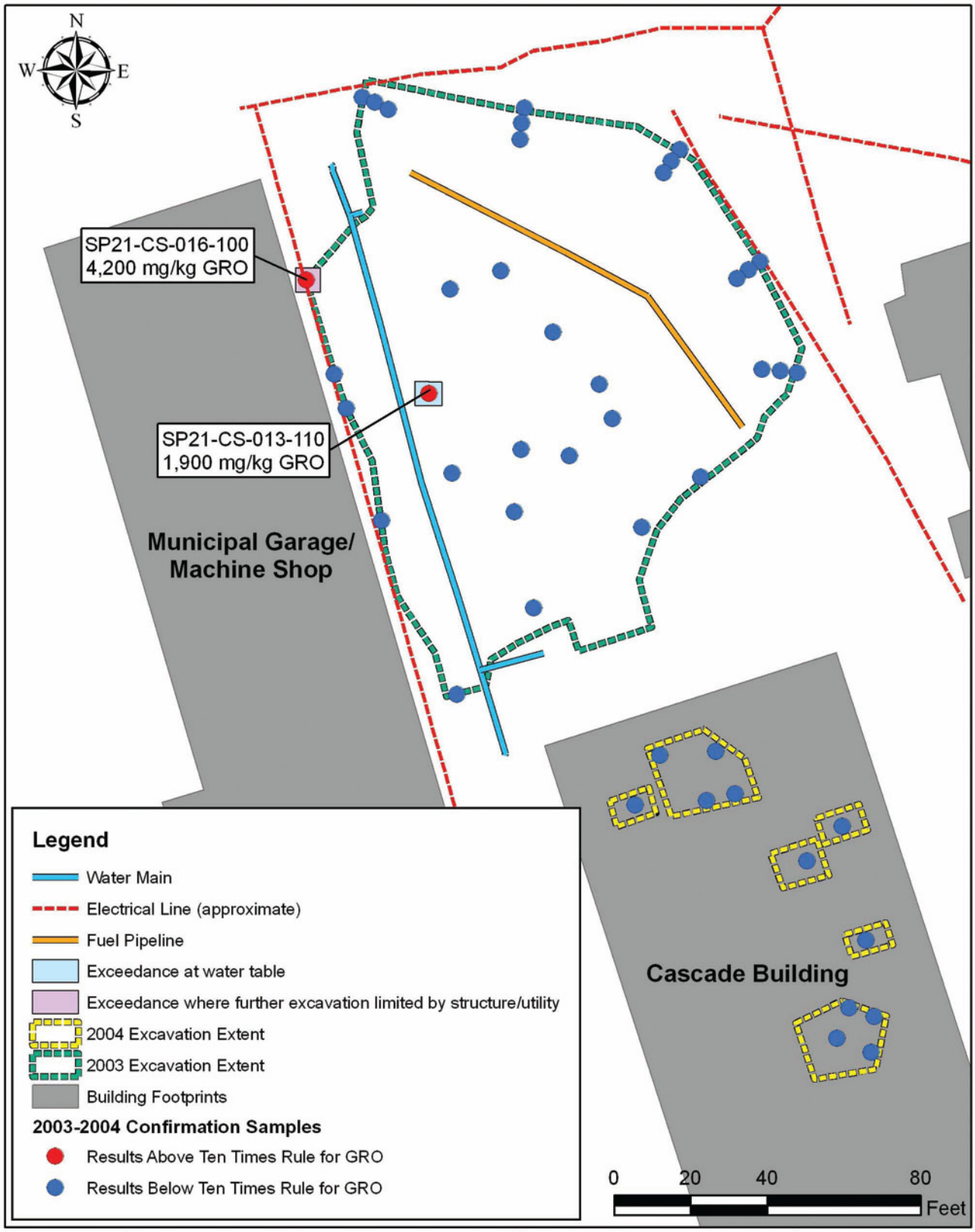


Figure 16b	Residual Contamination Report GRO Cascade Building Site 21/TPA Site 9f St. Paul Island, Alaska	Source: All Layers (NOAA Pribilof Project Office, 2005) Samples ('03-'04 Chemical Database) Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig16b_CascadeBldg_GRO.mxd Updated: 6/2/2008 @ 10:09:59 AM	Pribilof Islands Restoration Project

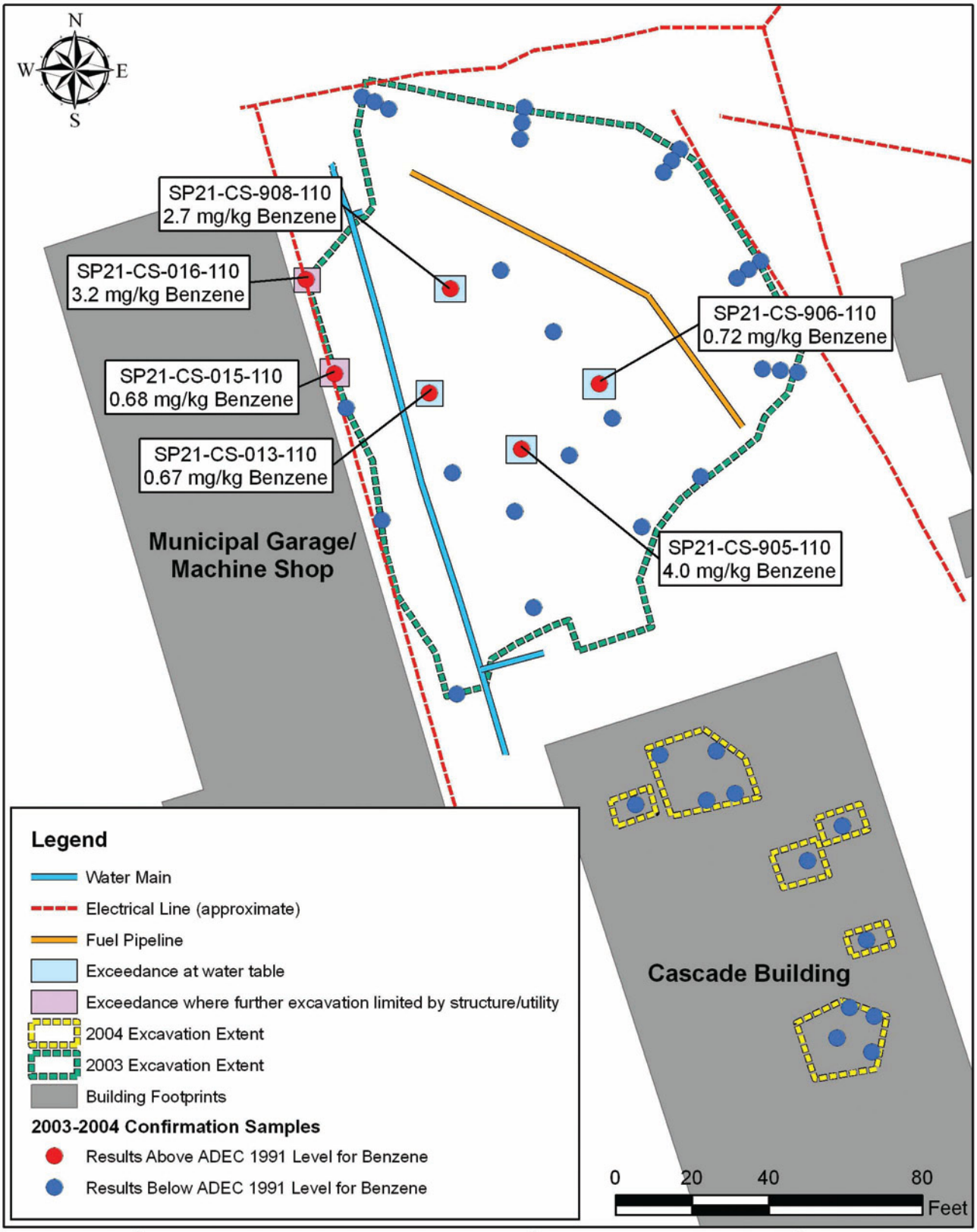


Figure 16c	Residual Contamination Report Benzene Cascade Building Site 21/TPA Site 9f St. Paul Island, Alaska	Source: All Layers (NOAA Pribilof Project Office, 2005), Samples ('03-'04 Chemical Database) Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig16c_CascadeBldg_BZ.mxd Updated: 6/2/2008 @ 10:16:28 AM	Pribilof Islands Restoration Project

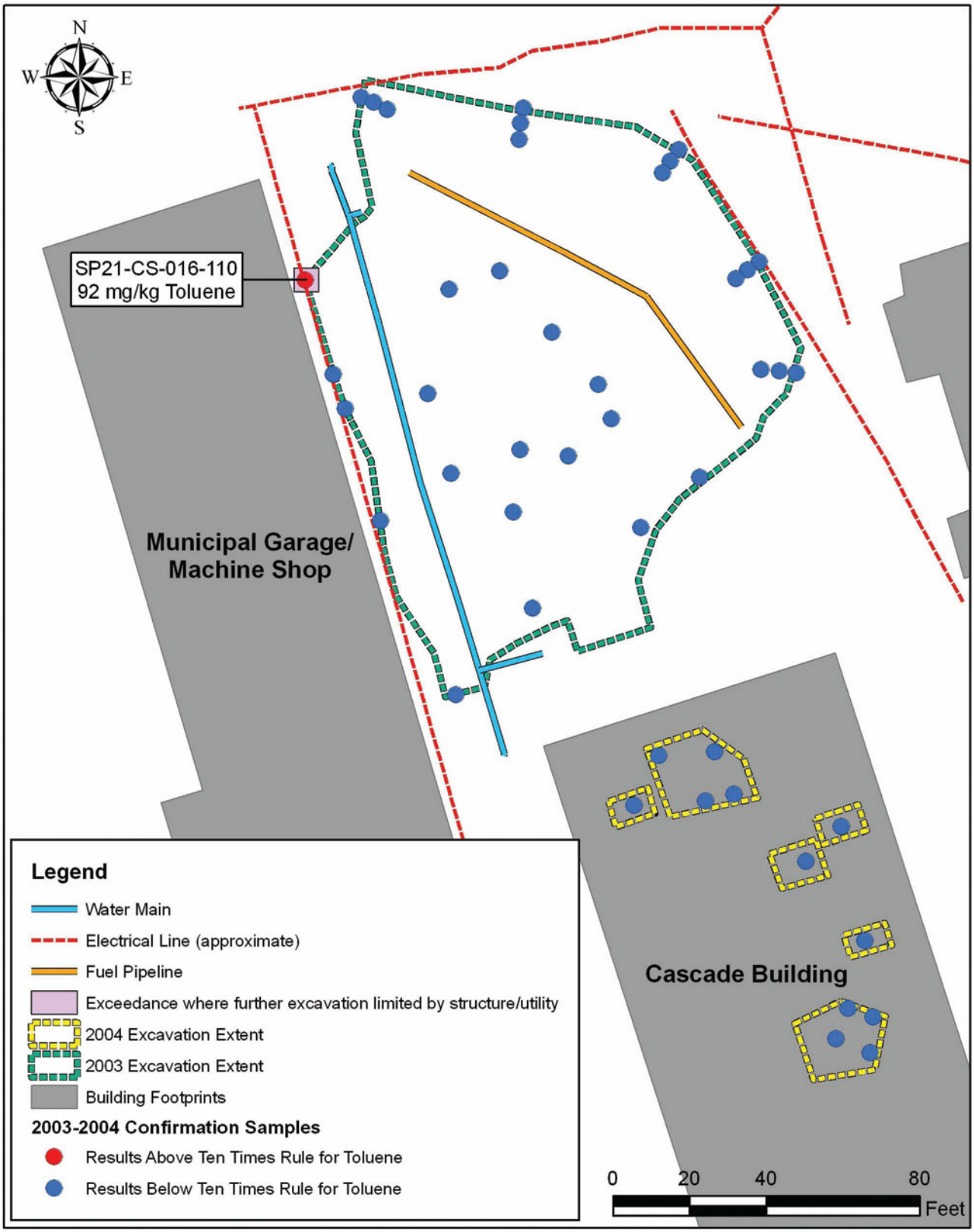


Figure 16d	Residual Contamination Report Toluene Cascade Building Site 21/TPA Site 9f St. Paul Island, Alaska	Source: All Layers (NOAA Pribilof Project Office, 2005), Samples ('03-'04 Chemical Database) Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig16d_CascadeBldg_BZME.mxd Updated: 6/2/2008 @ 10:19:47 AM	Pribilof Islands Restoration Project

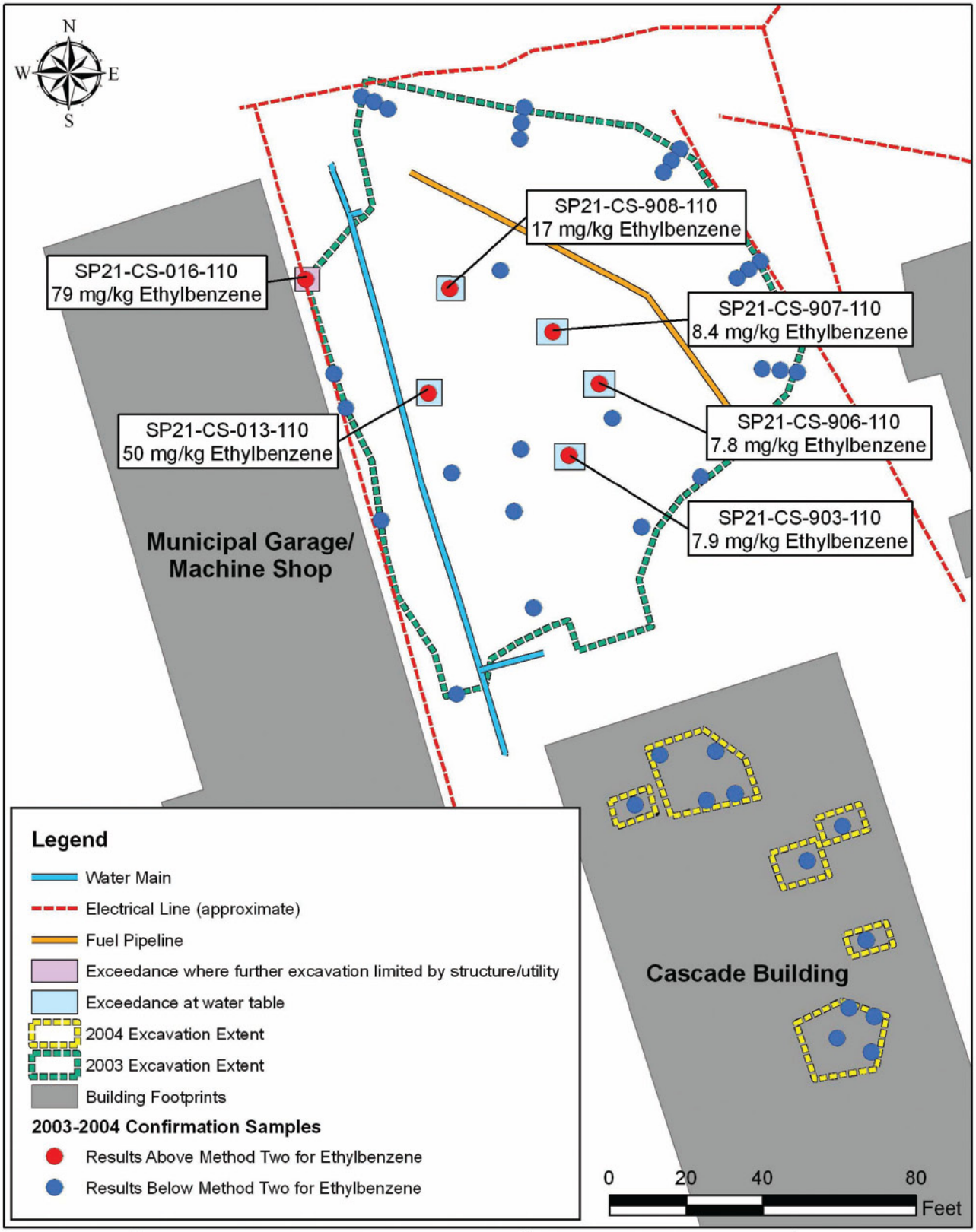


Figure 16e	Residual Contamination Report Ethylbenzene Cascade Building Site 21/TPA Site 9f St. Paul Island, Alaska	Source: All Layer (NOAA Pribilof Project Office, 2005), Samples ('03-'04 Chemical Database) Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig16e_CascadeBldg_EBZ.mxd Updated: 6/2/2008 @ 10:04:14 AM	Pribilof Islands Restoration Project

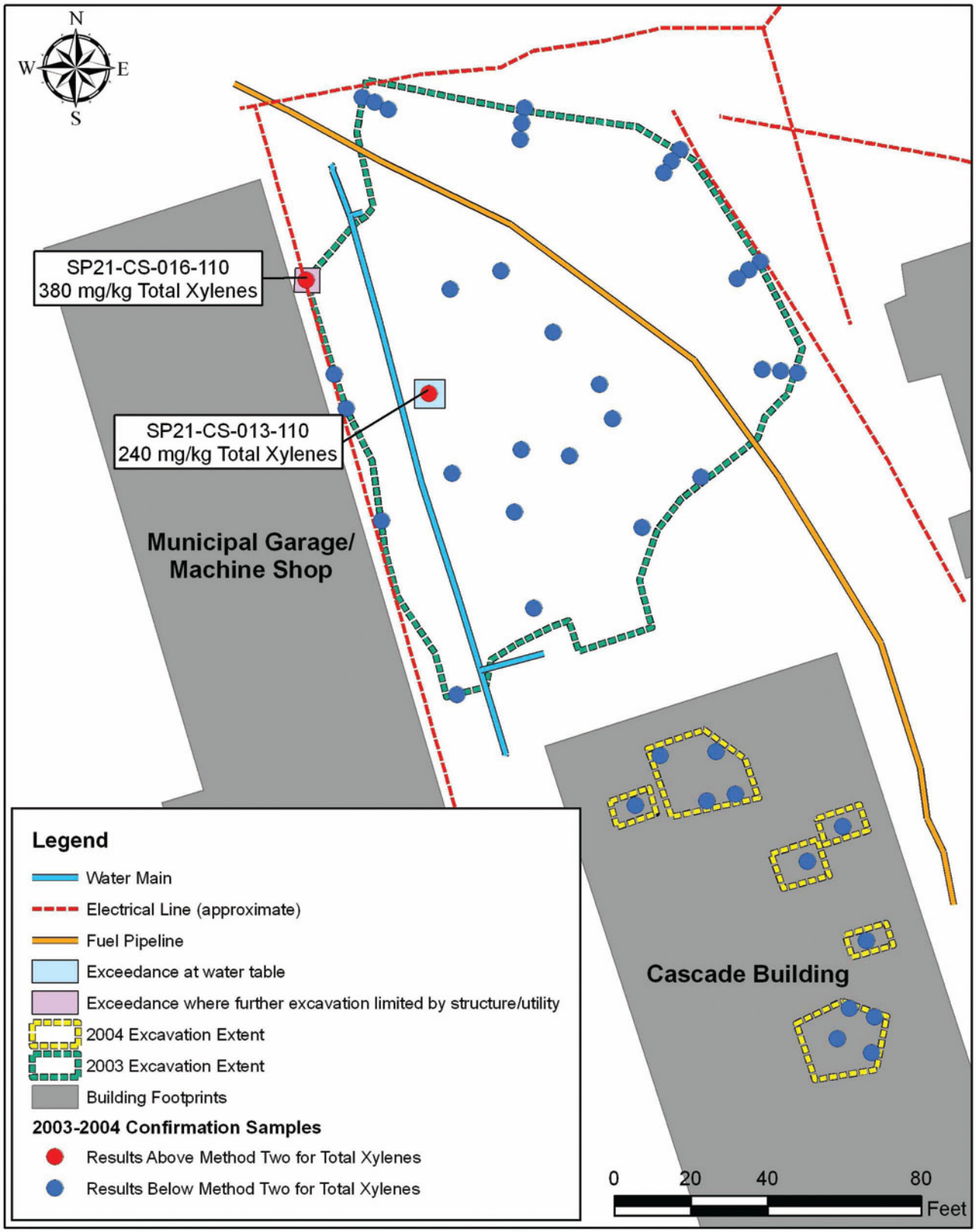


Figure 16f	Residual Contamination Report Total Xylenes Cascade Building Site 21/TPA Site 9f St. Paul Island, Alaska	Source: All Layers (NOAA Pribilof Project Office, 2005), Samples ('03-'04 Chemical Database) Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig16f_CascadeBldg_TotalXylenes.mxd Updated: 6/2/2008 @ 10:28:19 AM	Pribilof Islands Restoration Project

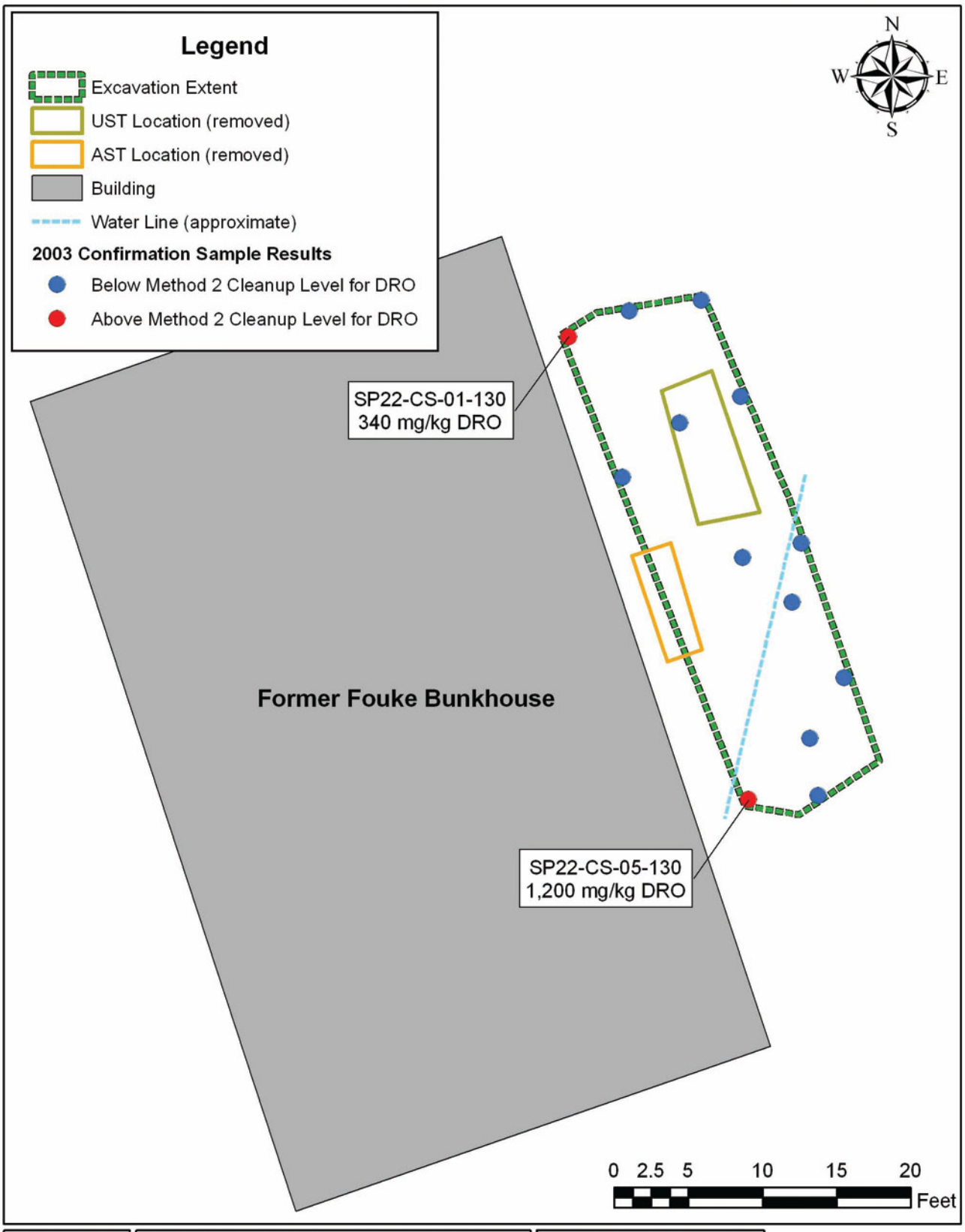


Figure 17	Residual Contamination Report Former Fouke Bunkhouse Site 22/TPA Site 9g St. Paul Island, Alaska	Sources: All layers (NOAA Pribilof Project Office GIS) Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig17_Former_Fouke_BH.mxd Date: 6/2/2008 @ 10:30:13 AM	Pribilof Islands Restoration Project

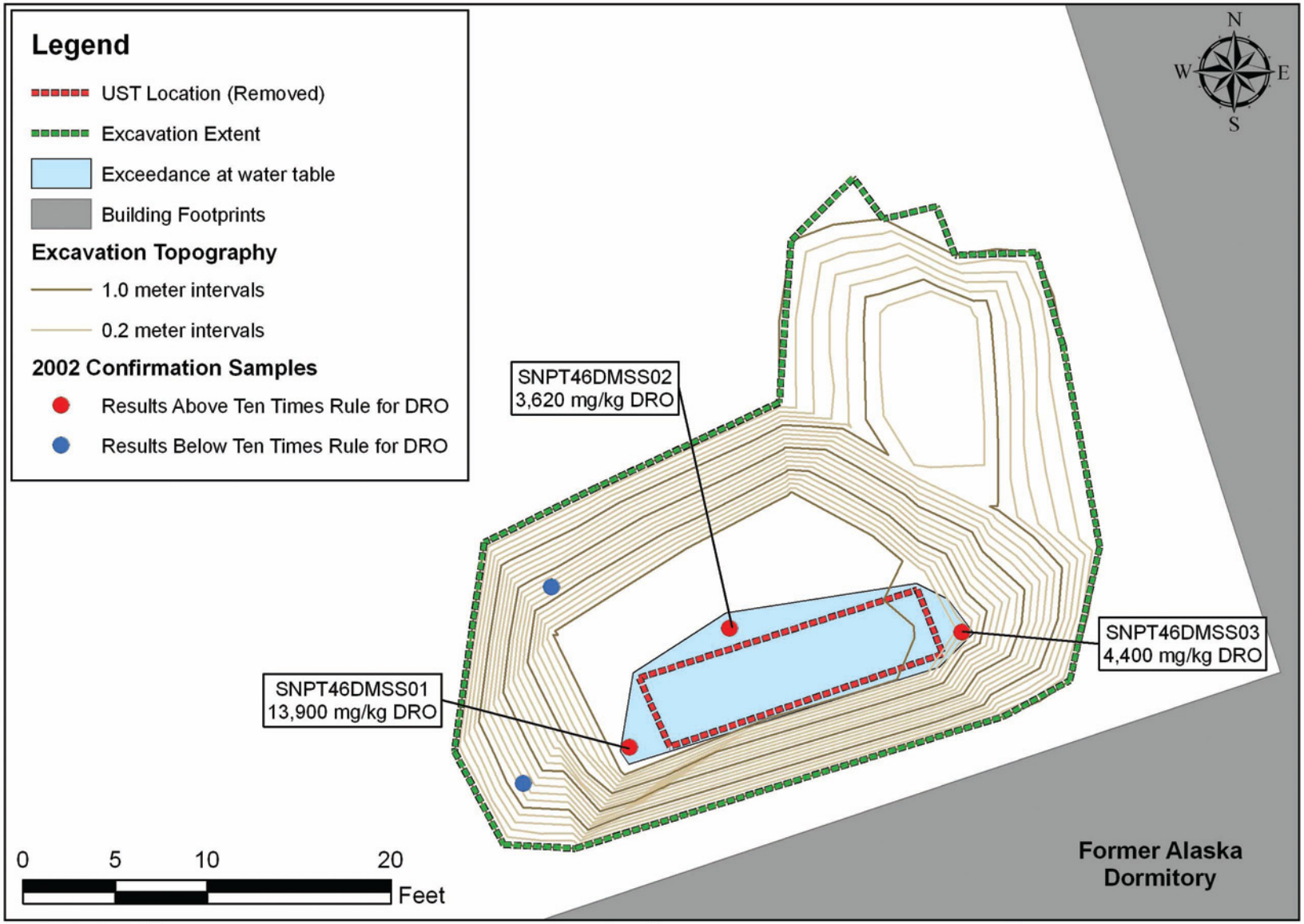


Figure 18	Residual Contamination Report Former Alaska Dormitory Site 23/TPA Site 9h St. Paul Island, Alaska	Sources: All Layers (NOAA Pribilof Project GIS, 2005). Path: C:\KP_GIS Data\Maps & Figures\ SNP\Residual Contamination\ Fig18_AK_Dormitory.mxd Updated: 6/2/2008 @ 10:31:23 AM	Pribilof Islands Restoration Project

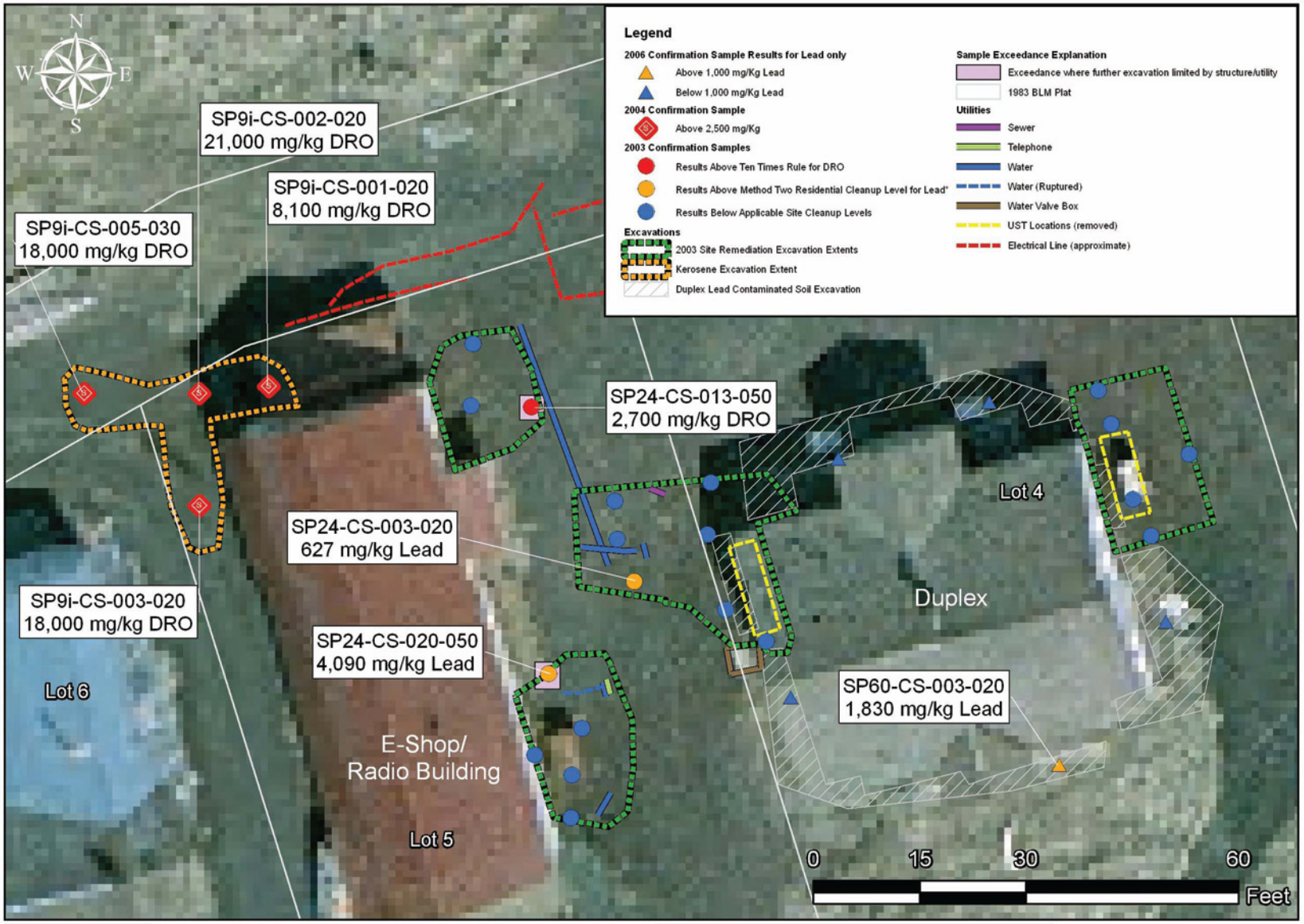


Figure 19	Residual Contamination Report E-Shop/Radio Building and Duplex Site 24/TPA Site 9i St. Paul Island, Alaska	Sources: All Layers (NOAA Pribilof Project GIS, 2005). Path: C:\KP_GIS Data\Maps & Figures\SNP\ Residual Contamination\Fig19_E-Shop_Duplex.mxd Updated: 6/2/2008 @ 10:35:24 AM Note: *Further sampling revealed no lead exceedances within 1 foot of the ground surface.	NOAA Pribilof Islands Restoration Project

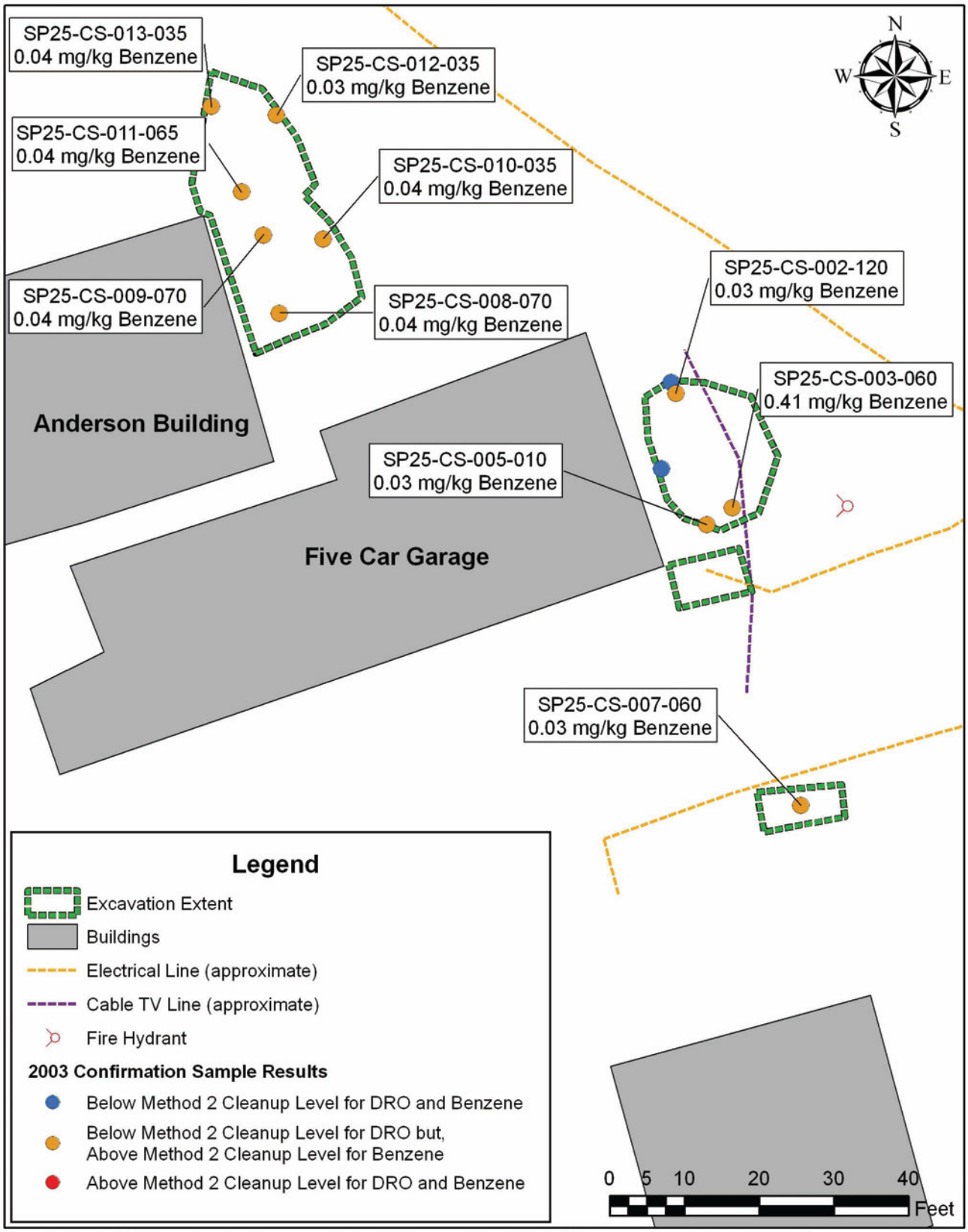


Figure 20	Residual Contamination Report Five Car Garage & Anderson Building Site 25/TPA Site 9j St. Paul Island, Alaska	Sources: All layers (NOAA PPO GIS) Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig20_5-Car_Garage_AndersonBldg.mxd Date: 6/2/2008 @ 10:36:42 AM

Pribilof Islands Restoration Project

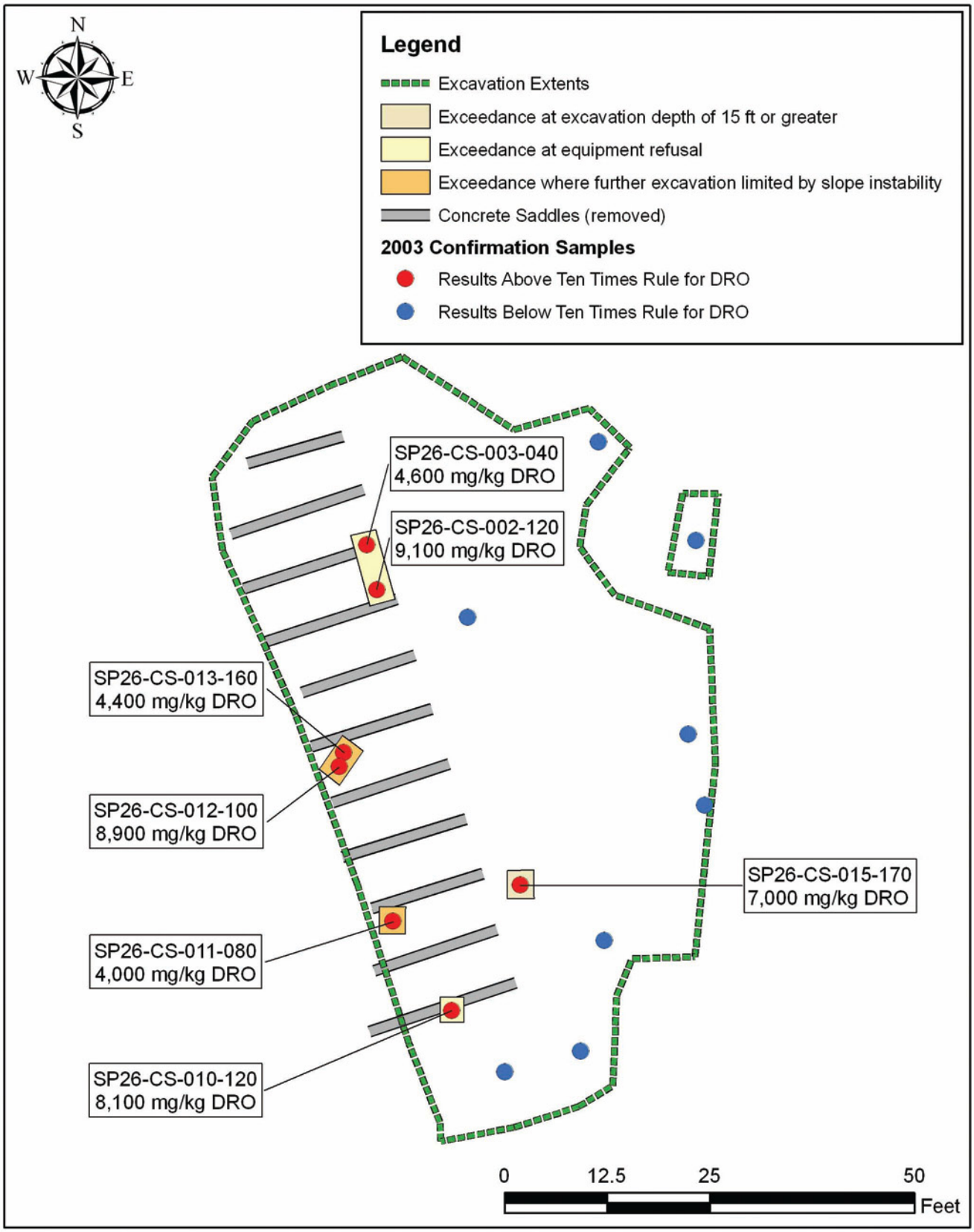


Figure 21	Residual Contamination Report AST Saddle Complex Site 26/TPA Site 9k St. Paul Island, Alaska	Source: All Layers (NOAA Pribilof Project GIS, 2005). Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig21_AST_Saddle.mxd Updated: 6/2/2008 @ 10:38:42 AM	Pribilof Islands Restoration Project

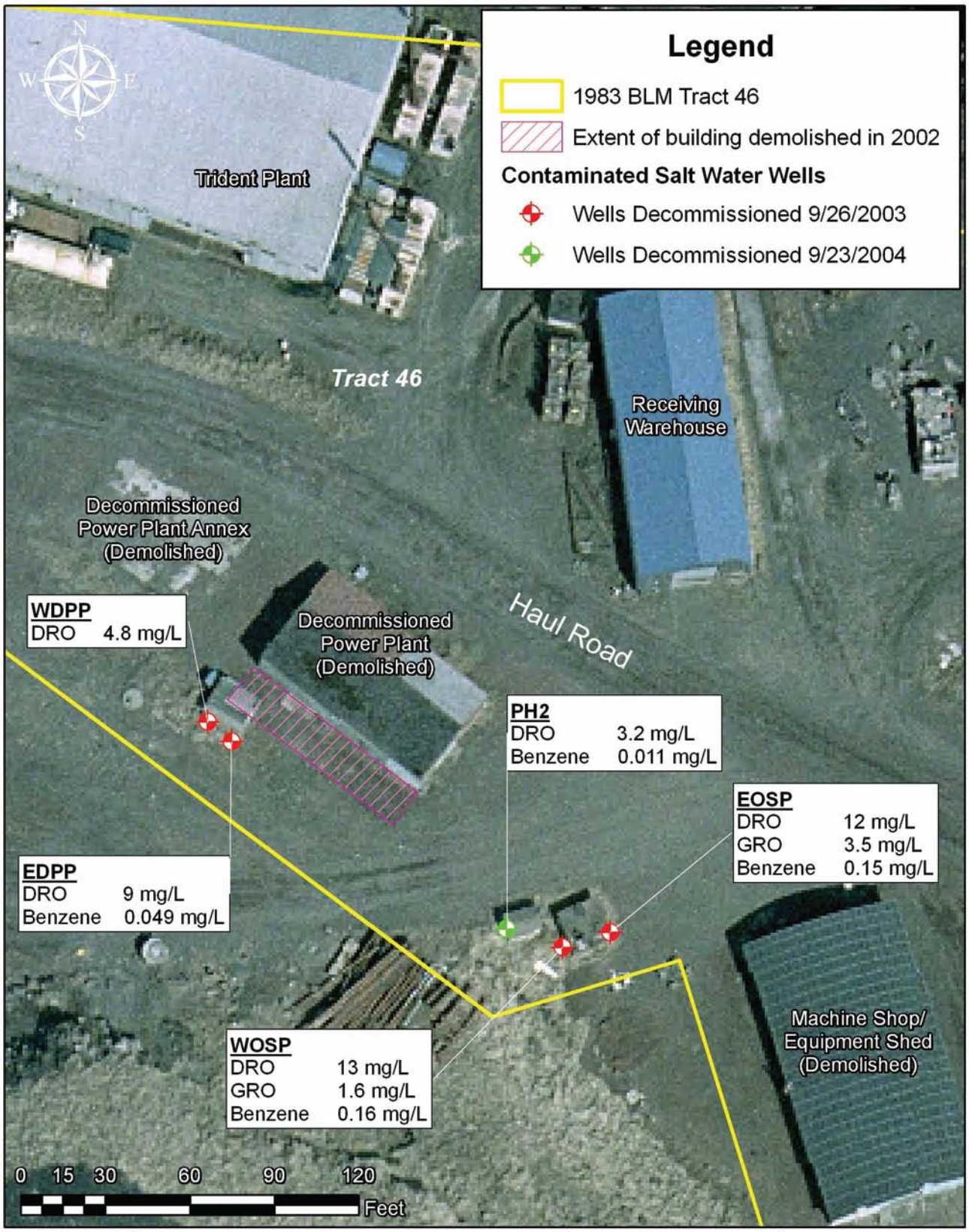


Figure 22	Residual Contamination Report Salt Water Wells Site 28/TPA Site 9m St. Paul Island, Alaska	Sources: Aero-Metric 1 ft 2006 Aerial Photo, Wells and Demolished Building (NOAA GIS), Wells Data (CESI Draft Site Characterization Report Tract 46 & Vicinity Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig22_Salt_Water_Wells.mxd Date: 6/2/2008 @ 10:40:06 AM	Pribilof Islands Restoration Project

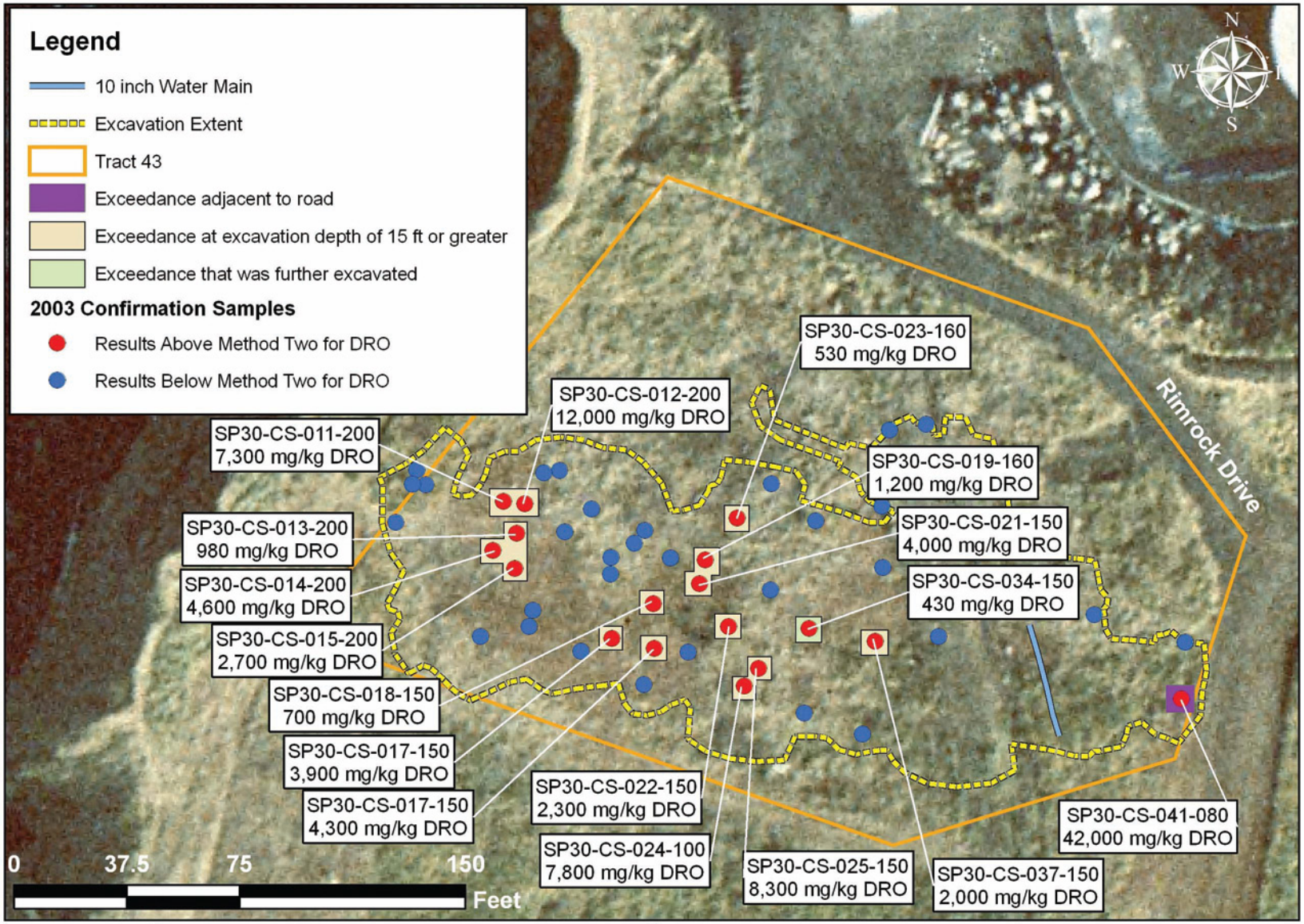


Figure 23

Residual Contamination Report
Former Diesel Tank Farm
Site 30/TPA Site 11
St. Paul Island, Alaska

Sources: Excavation Extent, Sample Locations, and Water Main (NOAA GIS 2005), Tract 43 (BLM 1983), Aerial Photo (Aeromap US 1996).
Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig23_Diesel_Tank_Farm.mxd
Updated: 6/2/2008 @ 10:41:10 AM

Pribilof Islands Restoration Project

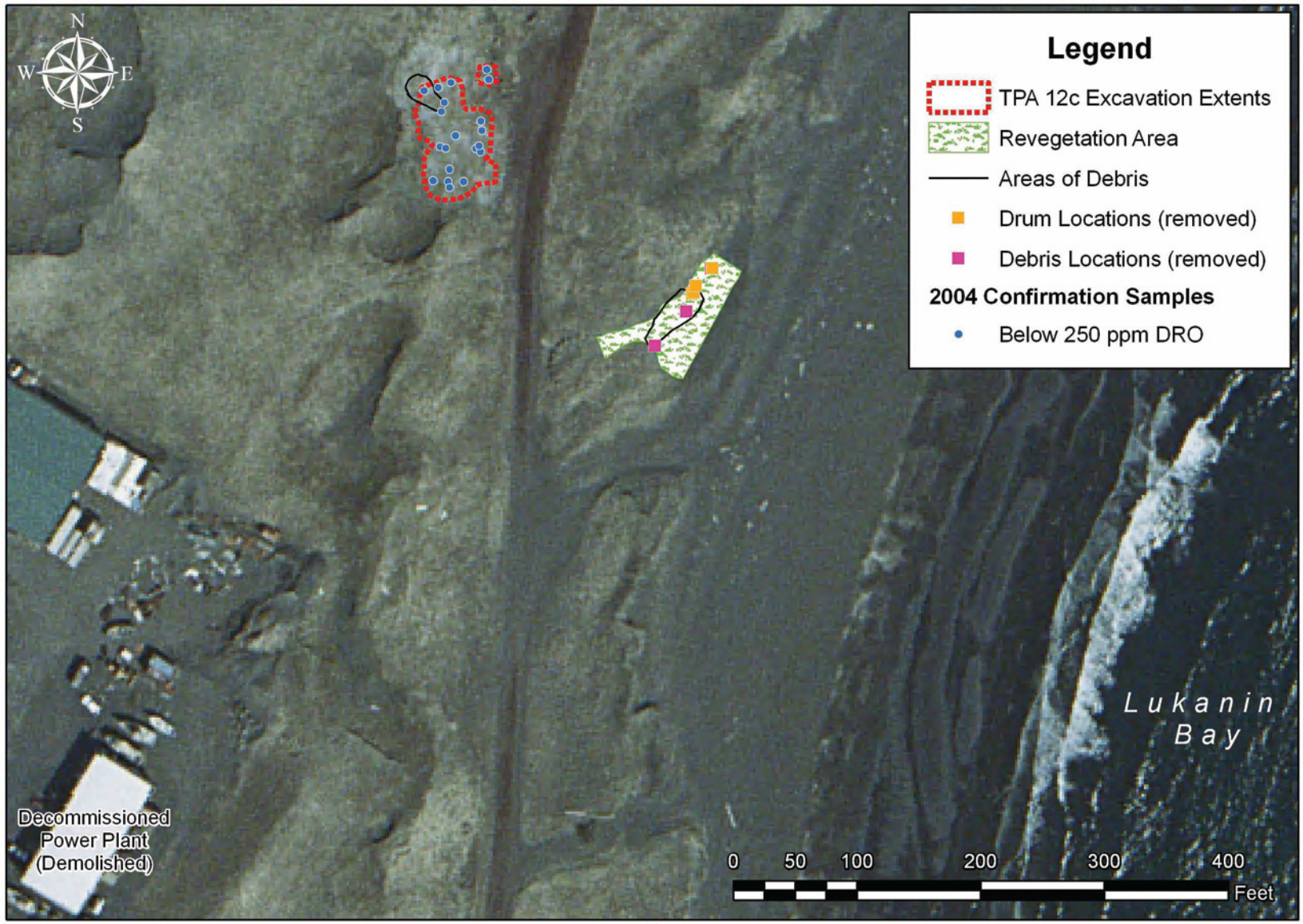


Figure 24	Residual Contamination Report Lukanin Bay Sites 31, 32, & 33/TPA Sites 12a, 12b, & 12c St. Paul Island, Alaska	Source: GIS Layers (NOAA PPO GIS 2004), Confirmation Samples (Chemical Database '03-'07), Aero-Metric 2006 2 ft Aerial Photo Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig24_Lukanin_Bay.mxd Date: 6/2/2008 @ 10:42:40 AM	Pribilof Islands Restoration Project

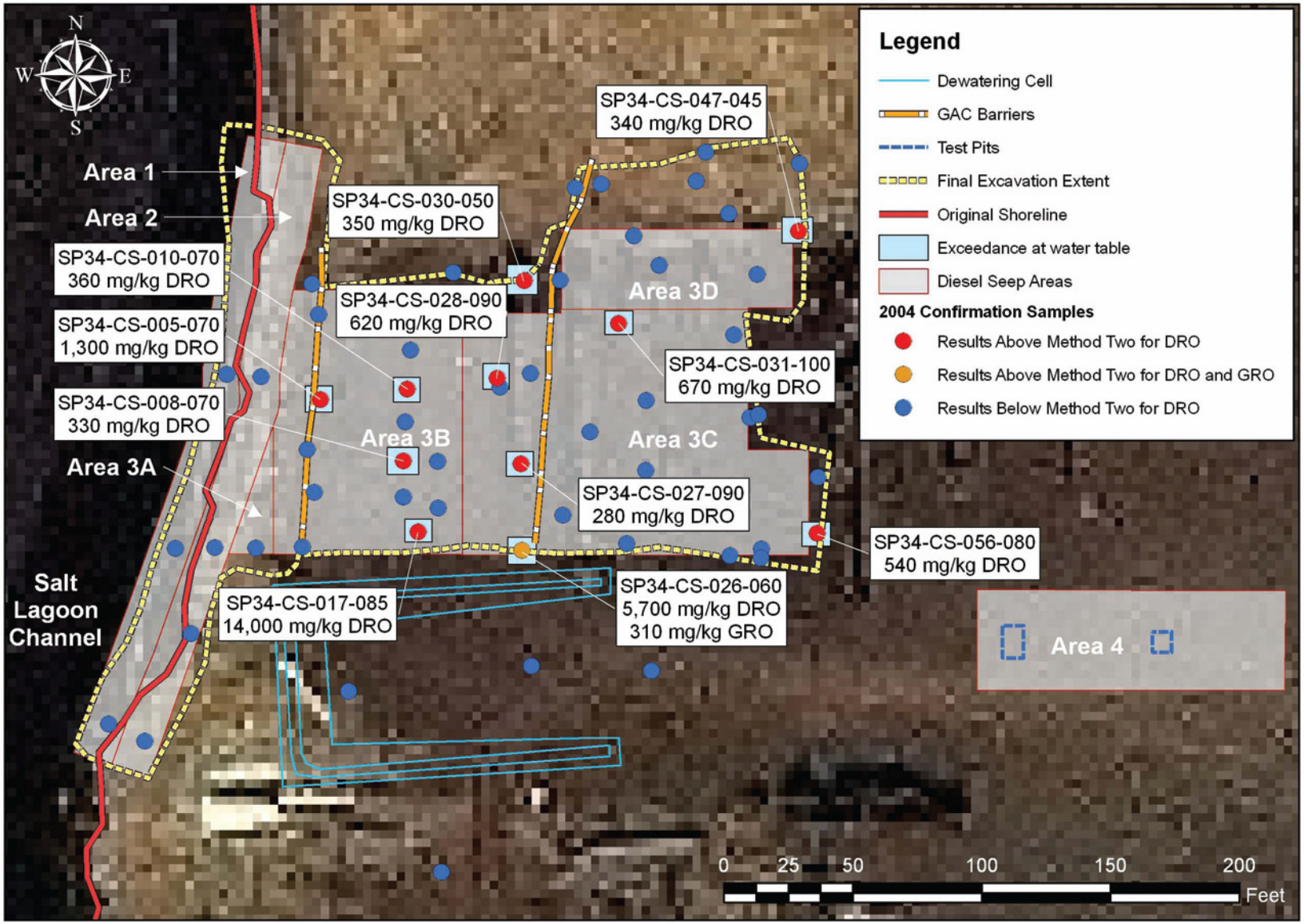


Figure 25	Residual Contamination Report Salt Lagoon Diesel Seep Sites 34 & 35/TPA Sites 13a & 13b St. Paul Island, Alaska	Sources: GIS Data (NOAA 2005), Satellite Imagery (Ikonos 2001). Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig25_Diesel_Seep.mxd Updated: 6/2/2008 @ 10:45:56 AM

Pribilof Islands Restoration Project

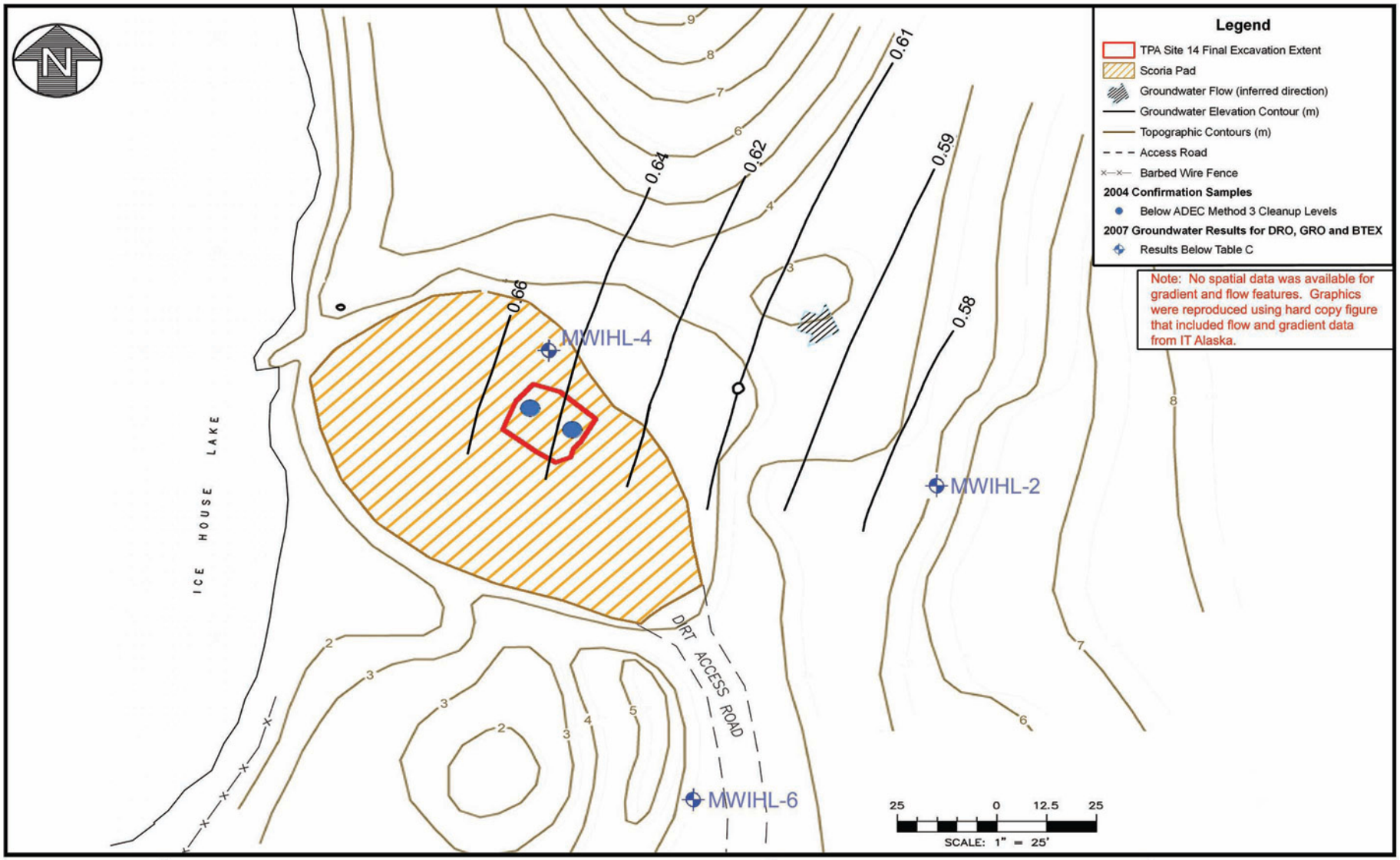


Figure 26

Residual Contamination Report
Icehouse Lake
Site 36/TPA Site 14
St. Paul Island, Alaska

Sources: Gradients, Flow, Topo, Roads, Fence (IT Alaska, Inc. 2001), Scoria Pad, Confirmation Samples, Excavation, Wells (NOAA GIS)
Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig26_IHL.psd
Date: 6/2/2008

Pribilof Islands Restoration Project

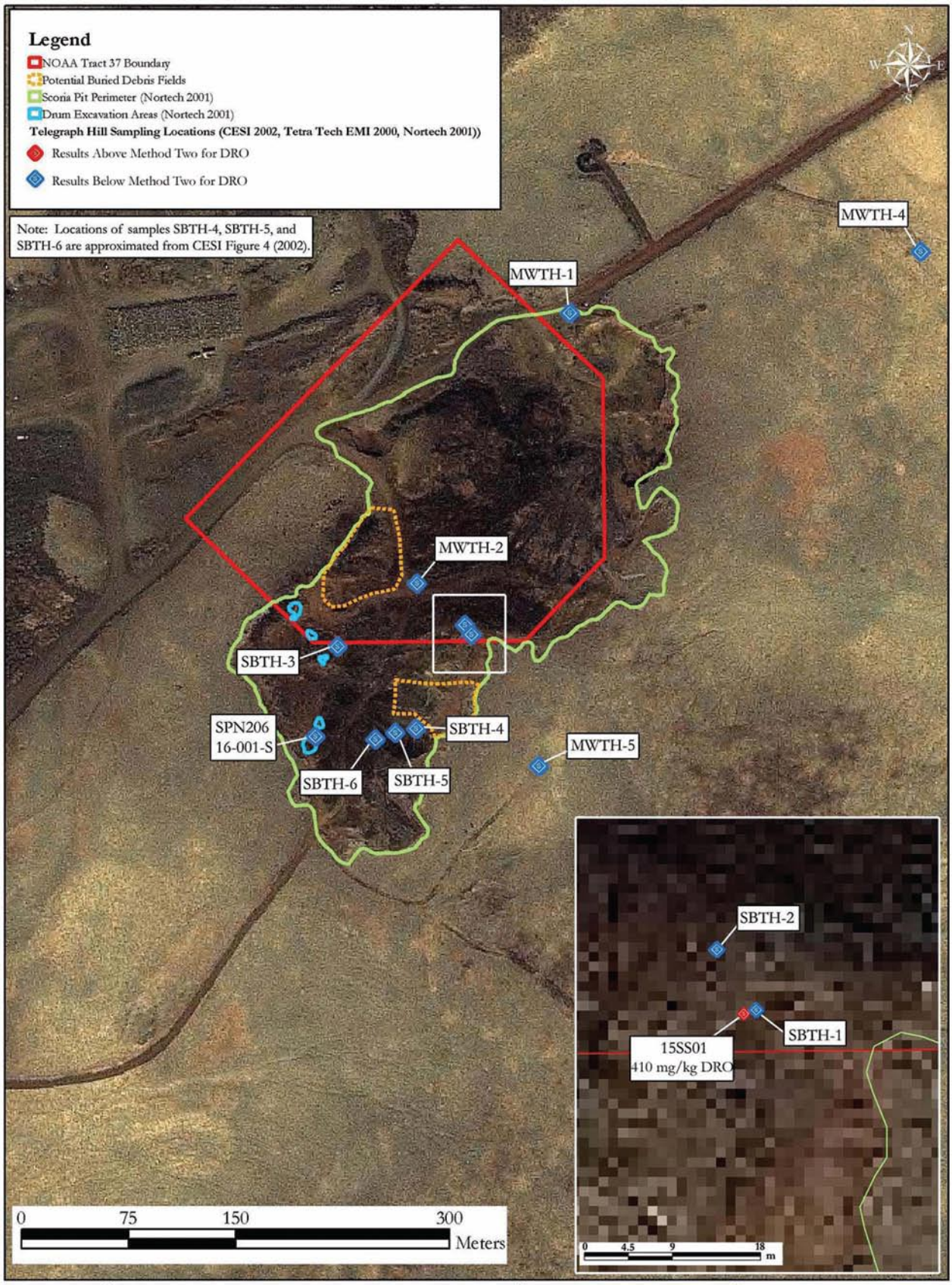


Figure 27	Residual Contamination Report Telegraph Hill Site 37/TPA Site 15a St. Paul Island, Alaska	**Sources:** Scoria Pit Perimeter, Drum Excavation Areas (Nortech 2001), Sampling Locations, Tract 37 Boundary & Potential Buried Debris Fields (NOAA 2003), Satellite Imagery (Ikonos 2001). **Path:** C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig27_Telegraph_Hill.psd **Updated:** 06/02/2008	Pribilof Islands Restoration Project

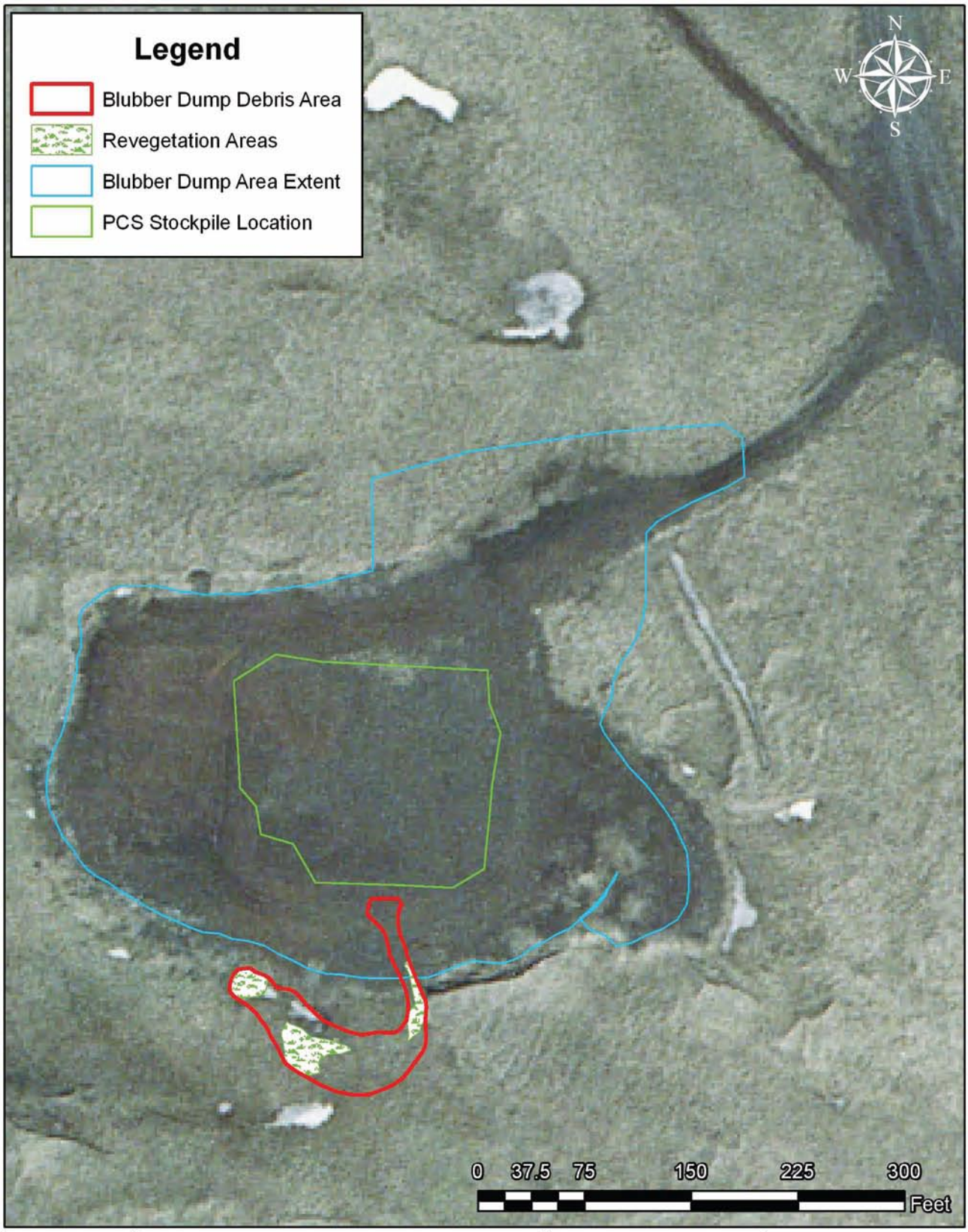


Figure 28	Residual Contamination Report Blubber Dump Debris NTPA Site 46 St. Paul Island, Alaska	Sources: Blubber Dump Layers (NOAA PPO GIS), Aero-Metric 2 ft Aerial Photo Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig28_Blubber_Dump.mxd Date: 6/2/2008 @ 10:59:11 AM	Pribilof Islands Restoration Project

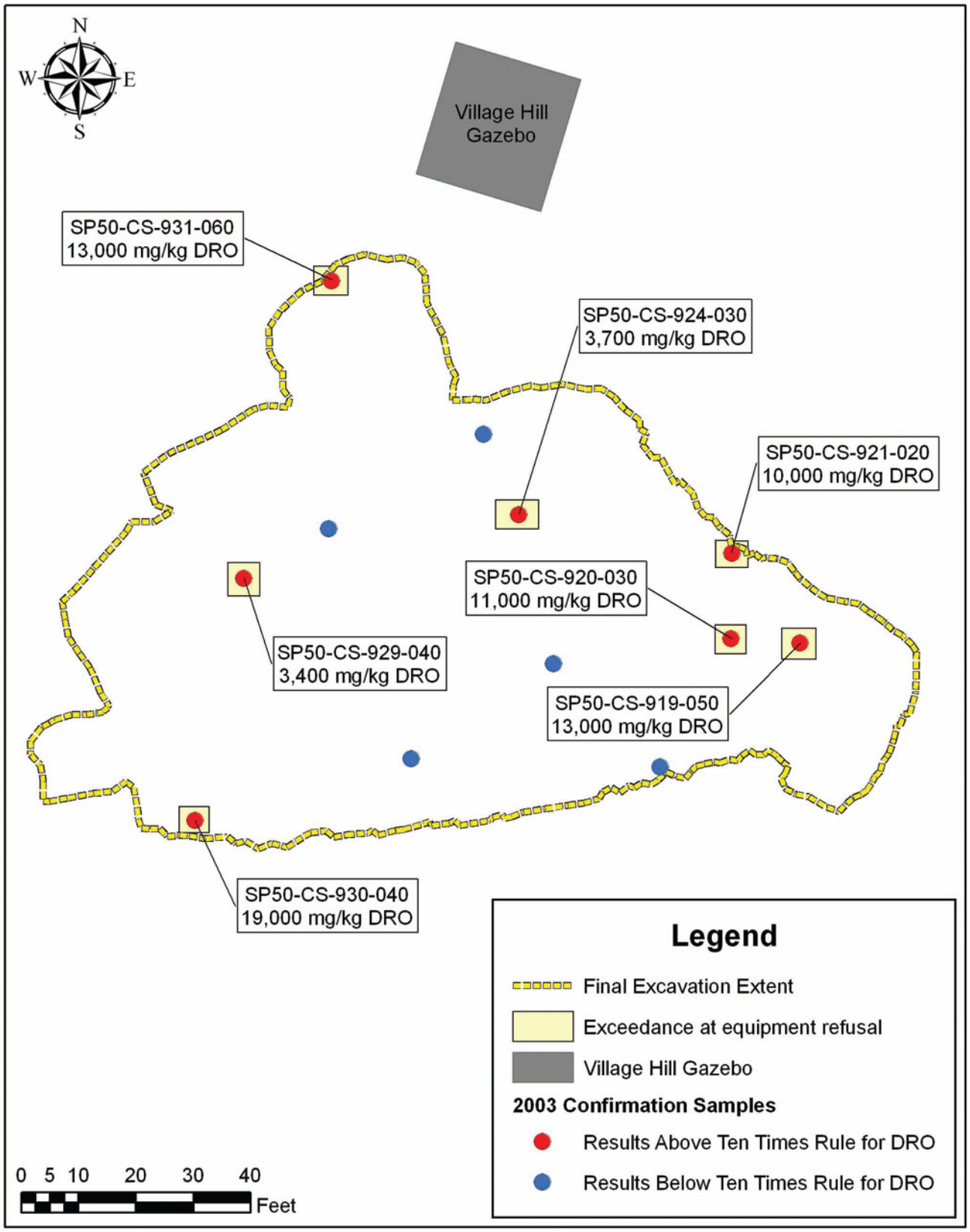


Figure 29	Residual Contamination Report Former Gasoline/ Diesel Drum Storage Area Site 50/TPA Site 9o	Sources: Excavation Extent & Confirmation Sample Locations (NOAA GPS/GIS 2003), Wells & Building Footprint (PPO GIS) Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig29_Diesel_Drum_Storage.mxd Updated: 6/2/2008 @ 11:01:40 AM	Pribilof Islands Restoration Project

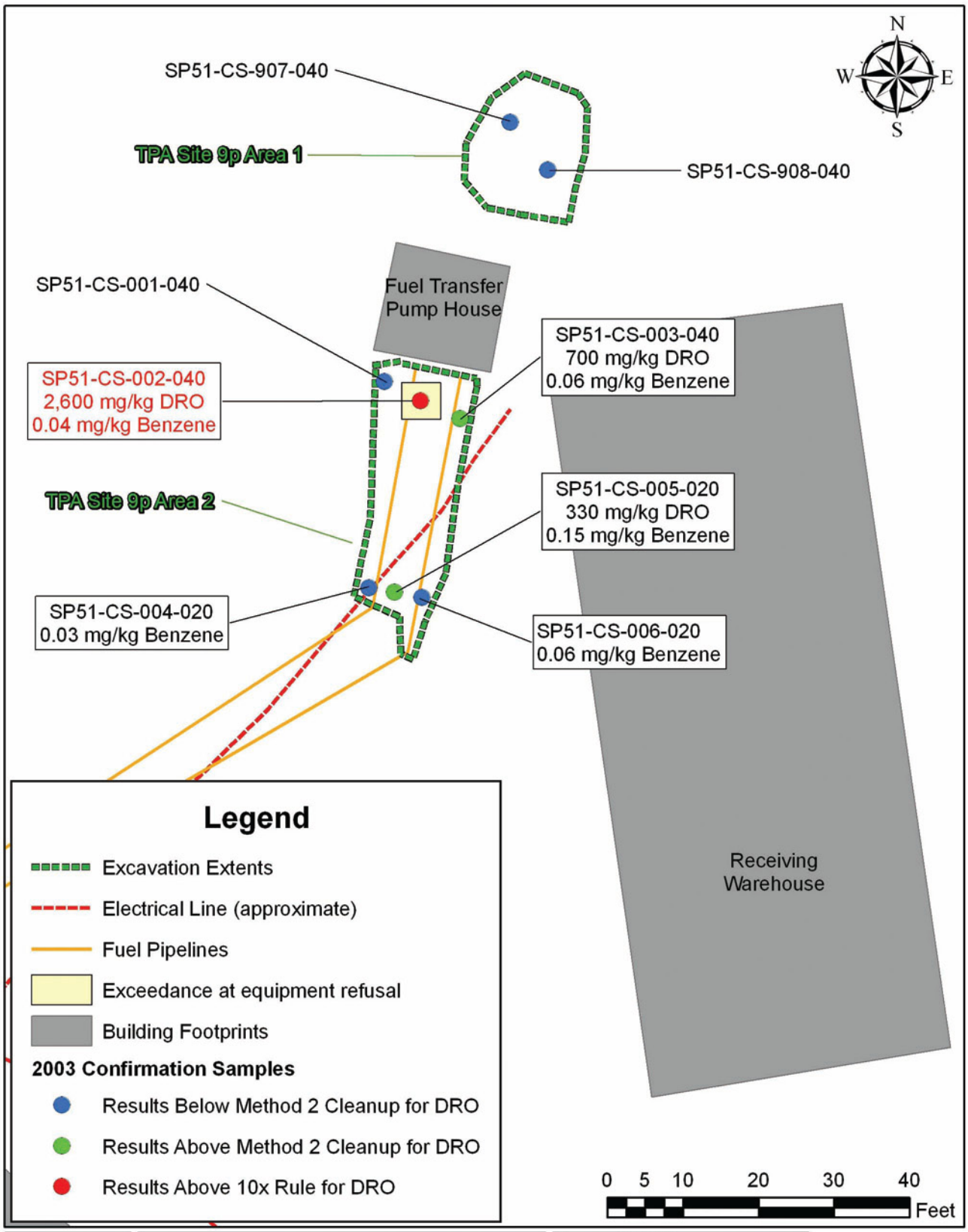


Figure 30	Residual Contamination Report West Dock Fuel Transfer Facility Site 51/TPA Site 9p St. Paul Island, Alaska	Sources: TPA 9p Layers (NOAA PPO GIS), Confirmation Samples (Chemical Database '03-'07) Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig30_West_Dock_Fuel_Transfer.mxd Date: 6/2/2008 @ 11:03:01 AM	Pribilof Islands Restoration Project

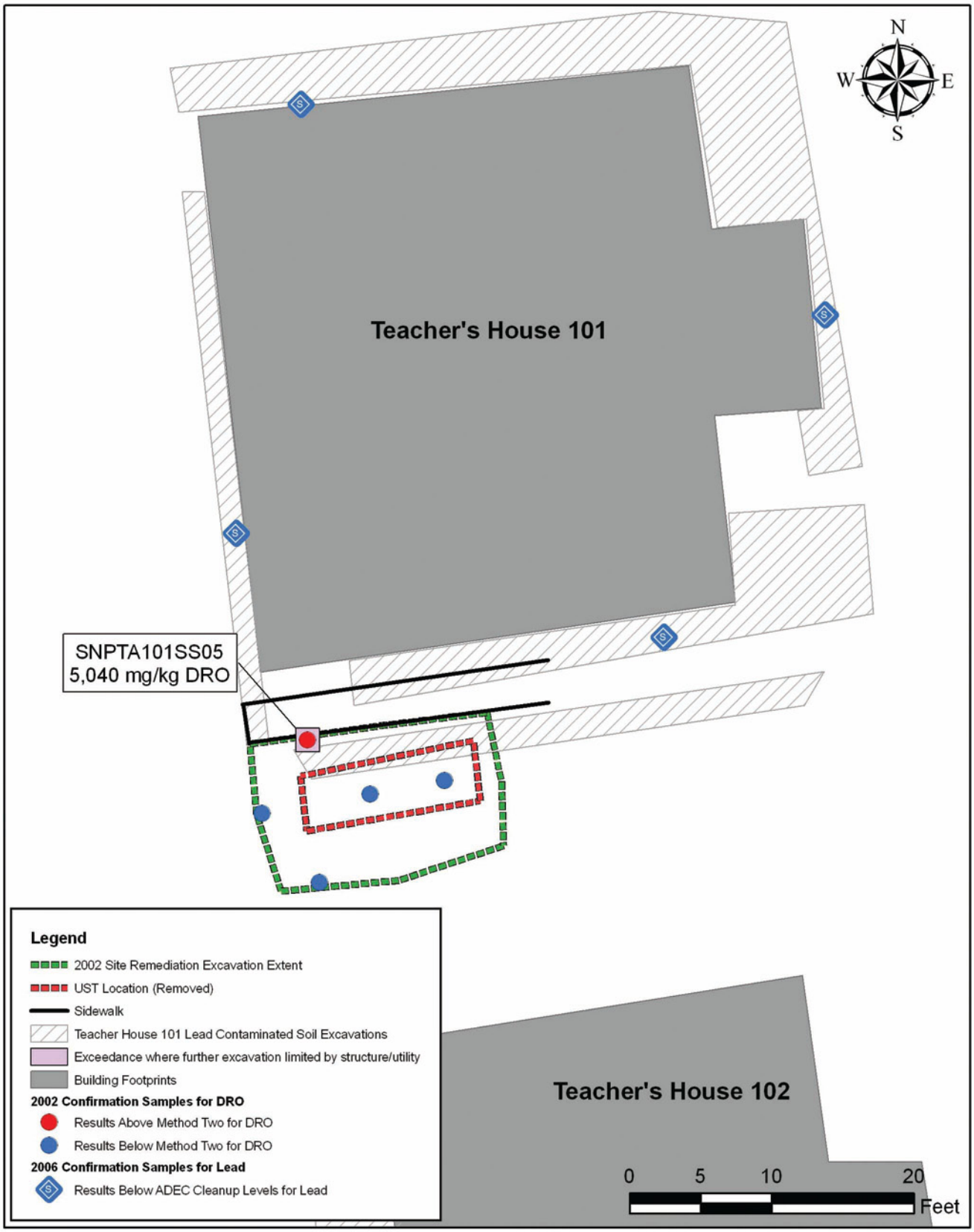


Figure 31	Residual Contamination Report Teacher Housing, House 101 UST Site 53/TPA Site 9q St. Paul Island, Alaska	Source: All layers (NOAA Pribilof Project GIS, 2005). Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig31_Teacher_House_101.mxd Updated: 6/2/2008 @ 11:04:21 AM	Pribilof Islands Restoration Project

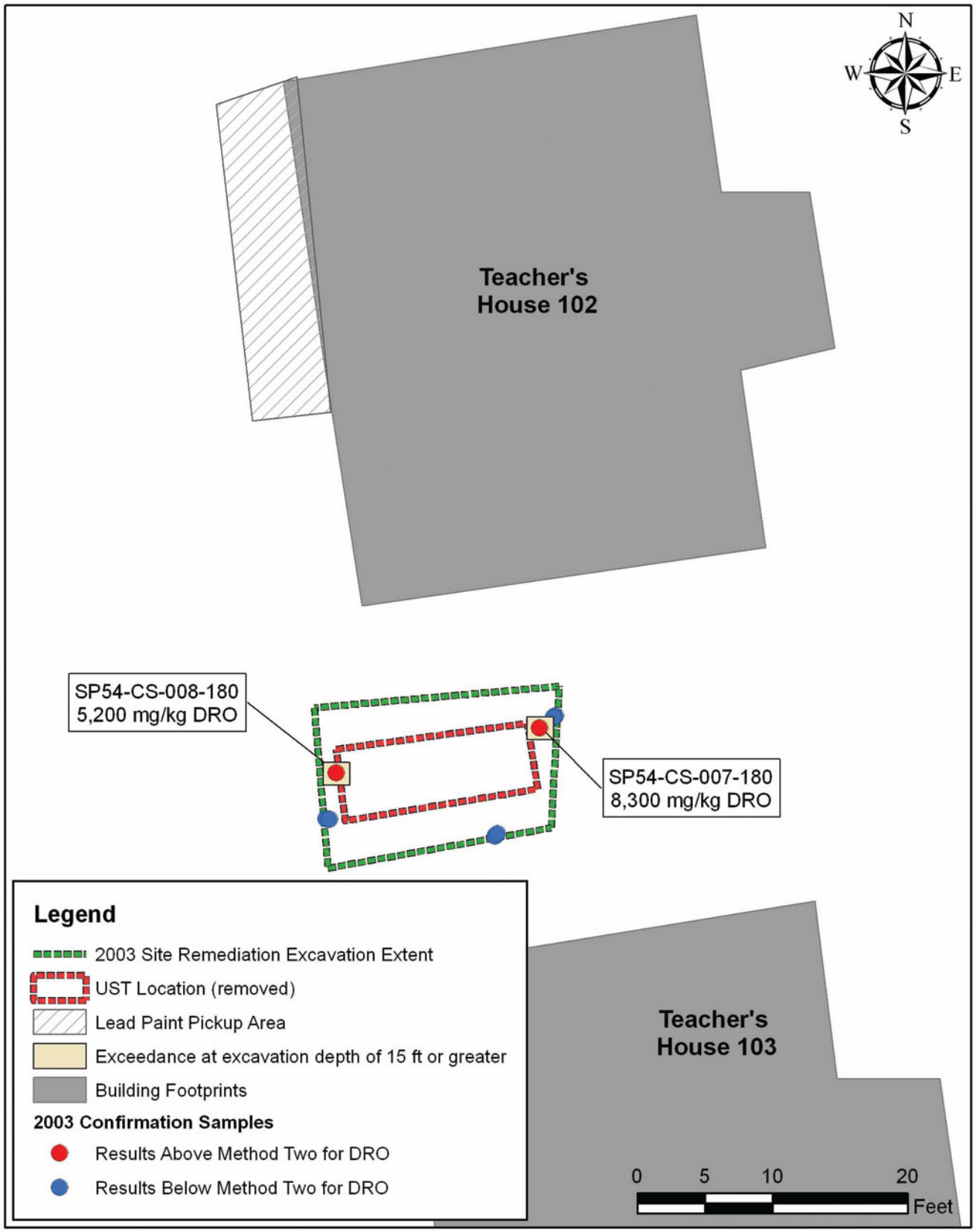


Figure 32	Residual Contamination Report Teacher Housing, House 102 UST Site 54/TPA Site 9r St. Paul Island, Alaska	Source: All layers (NOAA Pribilof Project GIS, 2005). Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig32_Teacher_House_102.mxd Updated: 6/2/2008 @ 11:05:26 AM

Pribilof Islands Restoration Project

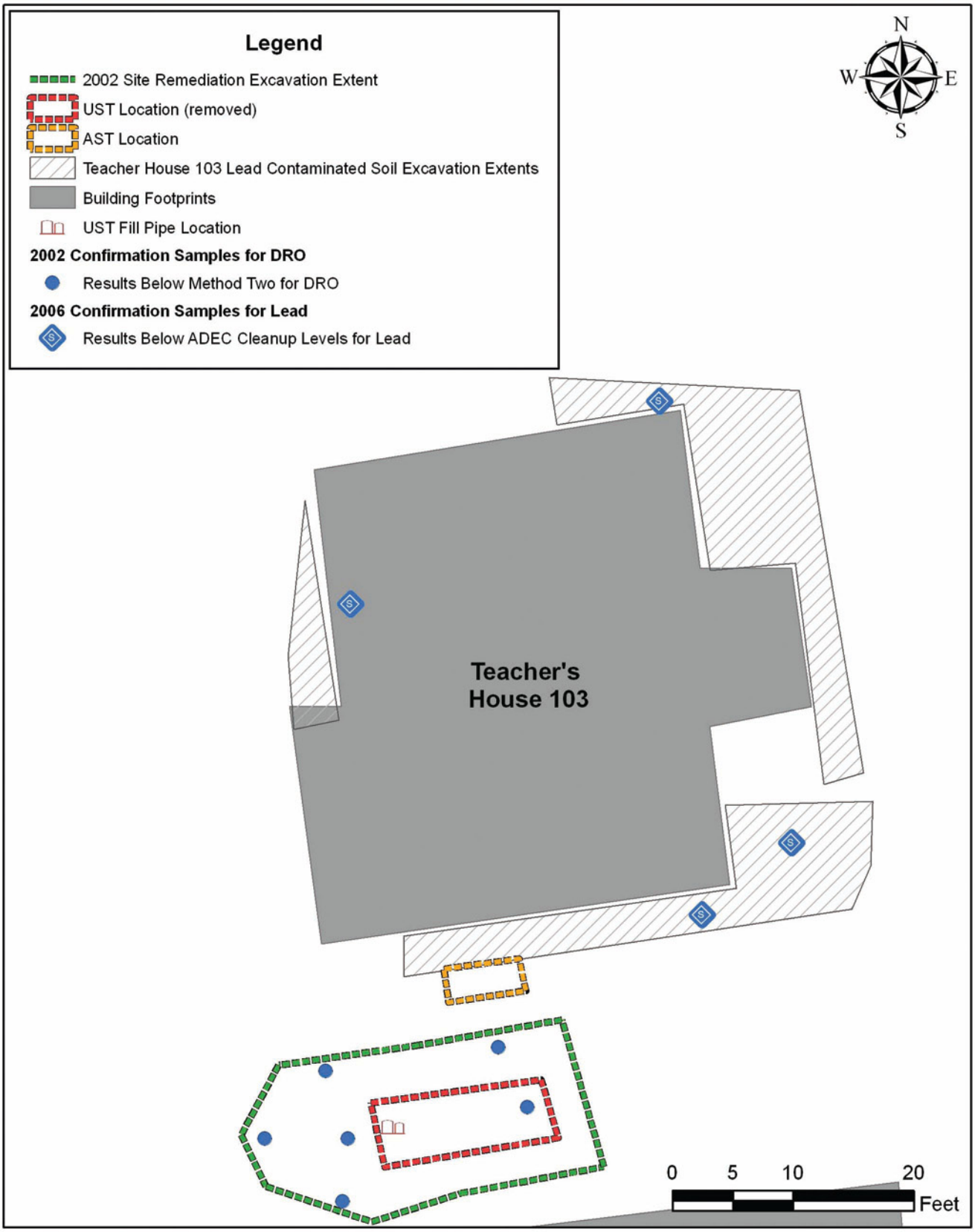


Figure 33	Residual Contamination Report Teacher Housing, House 103 UST Site 55/TPA Site 9s St. Paul Island, Alaska	Source: All layers (NOAA Pribilof Project GIS, 2005). Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig33_Teacher_House_103.mxd Date: 6/2/2008 @ 11:07:20 AM	Pribilof Islands Restoration Project

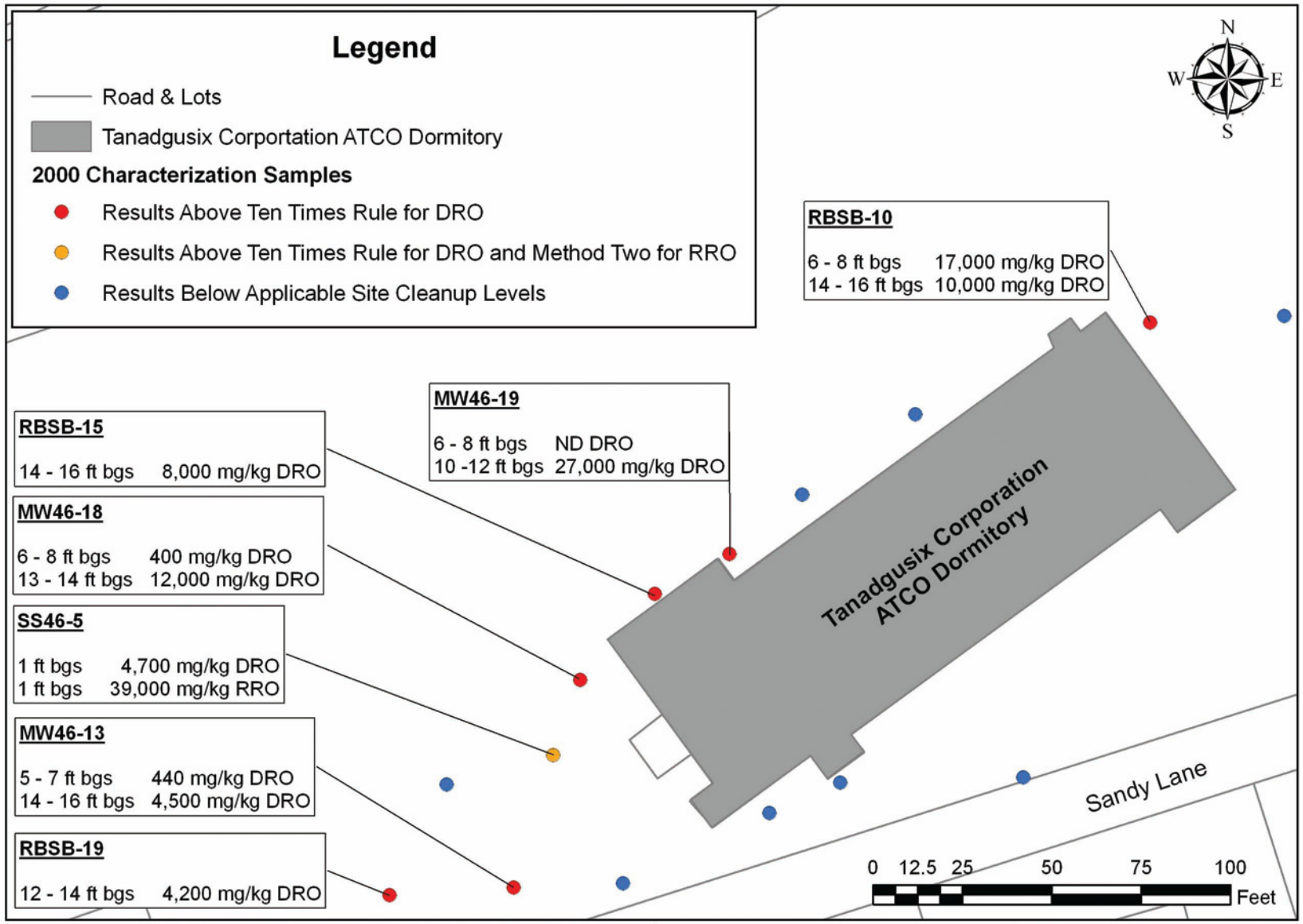


Figure 34

Residual Contamination Report
ATCO/Radio Building Barrel Staging Area
NTPA Site 56
St. Paul Island, Alaska

Sources: Boundaries and Buildings (Hart-Crowser 1997), Sample Data (CESI 2000), Sample and Well Locations (Pribilof Project Database).
Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig34_ATCO_RadioBldg.mxd
Updated: 6/2/2008 @ 11:10:00 AM

Pribilof Islands Restoration Project

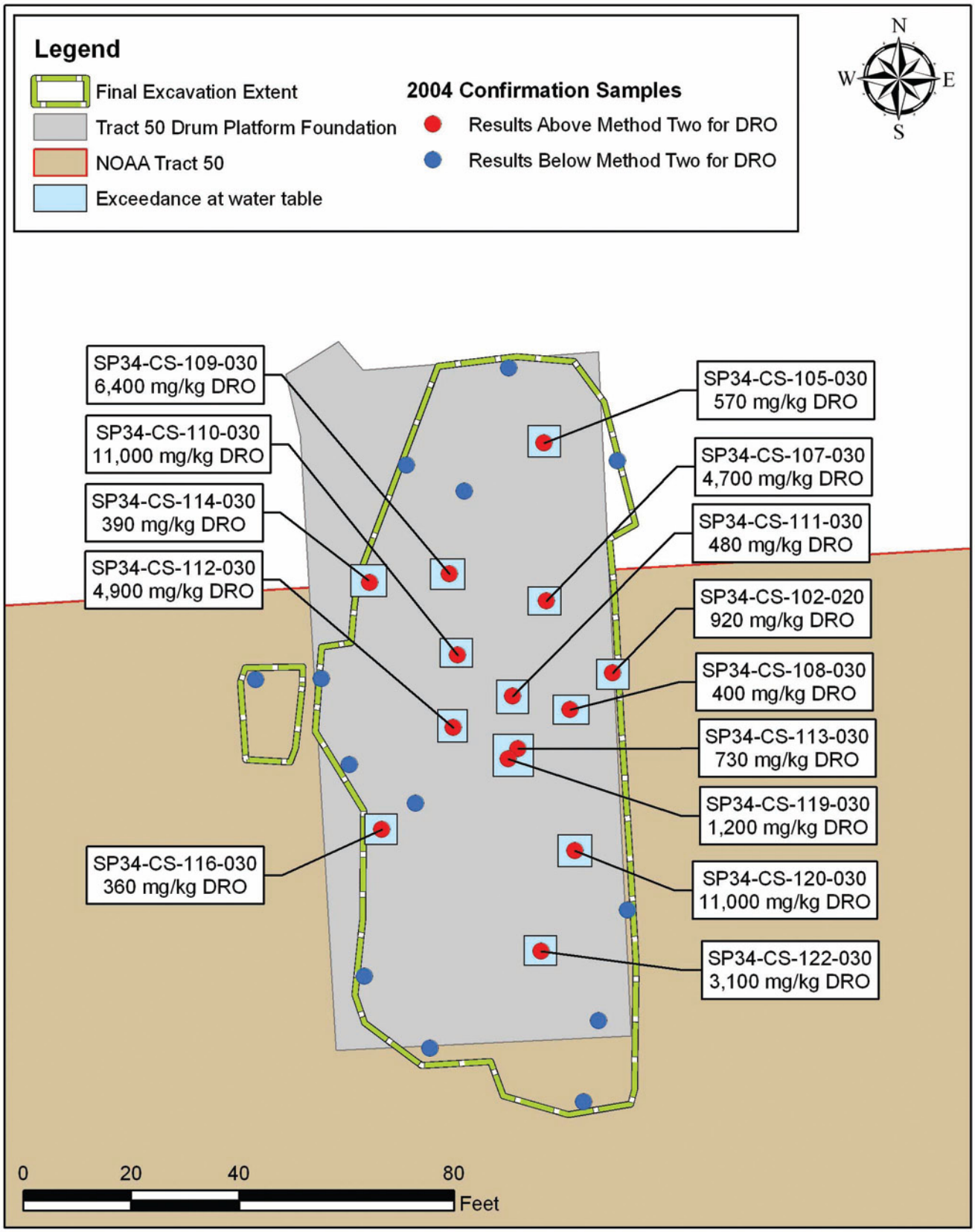


Figure 35	Residual Contamination Report Tract 50 Drum Platform Foundation NTPA Site 58 St. Paul Island, Alaska	Sources: Sampling Locations and Excavation Extent (NOAA Pribilof Project GIS 2005), Tract 50 (BLM MTPs 1983). Path: C:\KP_GIS Data\Maps & Figures\SNP\Residual Contamination\Fig35_Tract50_Drum_Platform.mxd Updated: 6/2/2008 @ 11:11:14 AM	Pribilof Islands Restoration Project