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ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NAVFAC
Naval Facilities Engineering Command

Final
29 APRIL 2005

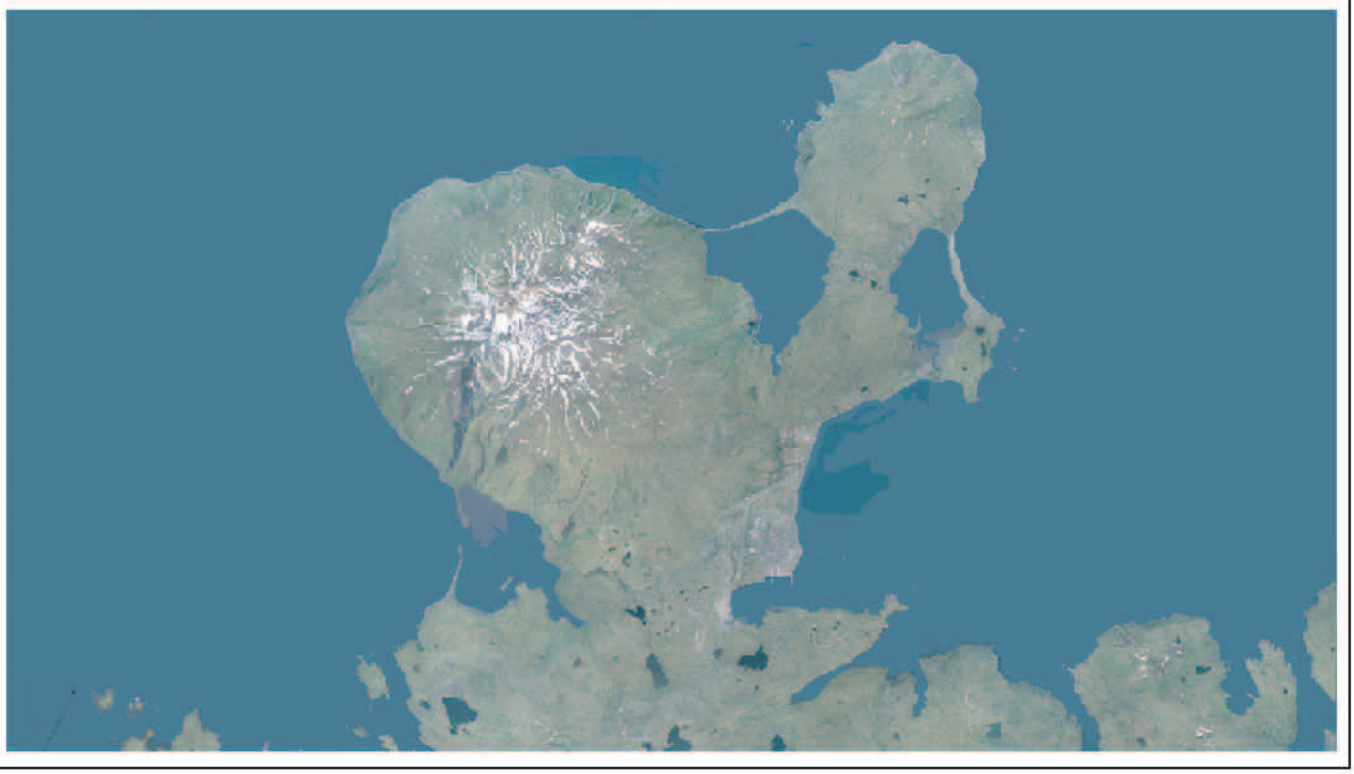
Final Decision Document for Petroleum Sites with No Unacceptable Risk

Former Adak Naval Complex

Adak, Alaska
Contract No. N44255-02-D-2008
Delivery Order No. 0037

Department of the Navy
Naval Facilities Engineering Command
Engineering Field Activity, Northwest
19917 Seventh Avenue NE
Poulsbo, WA 98370-7570

Alaska Department of
Environmental Conservation
555 Cordova St
Anchorage, AK 99502



FINAL DECISION DOCUMENT FOR PETROLEUM SITES WITH NO UNACCEPTABLE RISK FORMER ADAK NAVAL COMPLEX ADAK ISLAND, ALASKA

COVER SHEET AND SIGNATURE PAGE

SITE NAMES:
GCI Compound, Underground Storage Tank (UST) GCI-1 (***GCI Compound***)
Source Area (SA) 80, Steam Plant No. 4, USTs 27089 and 27090 (***SA 80***)
Tanker Shed, UST 42494 (***Tanker Shed***)
SA 78, Old Transportation Building, USTs 10583 and 10584 and Above-ground Storage Tanks (ASTs) (***SA 78***)
SA 82, P-80/P-81 Buildings, USTs 10579 and 10587 and AST 10333 (***SA 82***)
SA 88, P-70 Energy Generator, UST 10578 (***SA 88***)
Solid Waste Management Unit (SWMU) 58, Heating Plant No. 6 ***(SWMU 58/SA 73***)
SA 73, Heating Plant No. 6 (***SWMU 58/SA 73***)
Yakutat Hangar, UST T-2039A (***Yakutat Hangar***)
NORPAC Hill Seep Area (***NORPAC Hill***)

ALASKA DEC DATABASE RECORD KEY:

GCI Compound	199521X111101
SA 80	199425X018145
Tanker Shed	199425X031501
SA 78	200025X110660
SA 82	199425X018147
SA 88	199425X018153
SWMU 58	199325X014554
SA 73	200025X110659
Yakutat Hangar	199325X034431
NORPAC Hill	200025X110638

ALASKA DEC REGULATORY AUTHORITY: Oil and Other Hazardous Substances Pollution Control (18 AAC 75, Article 3)

RESPONSIBLE PARTY:
Mark Wicklein, P.E.
Engineering Field Activity, Northwest
Naval Facilities Engineering Command
19917 Seventh Avenue NE
Poulsbo, WA 98370-7570

CONTAMINANTS OF POTENTIAL CONCERN/MEDIA IMPACTED:

Soil: Petroleum hydrocarbons, polychlorinated biphenyls (PCBs), and metals
Groundwater: Petroleum hydrocarbons and chlorinated volatile organic compounds
Surface Water and Sediment: Petroleum hydrocarbons

ON-SITE CONTAMINANT CONCENTRATIONS:

These 10 free-product recovery sites pose no unacceptable risk to human health or the environment above target health goals, provided that institutional controls remain in effect. Benzene, diesel-range organics (DRO), gasoline-range organics (GRO), and methylene chloride were detected at one or more site at concentrations greater than Alaska Department of Environmental Conservation (DEC) groundwater cleanup levels as shown in the table below. These concentrations could pose a risk to human health if institutional controls were no longer in place, and the groundwater was used as a drinking water source.

Site	Benzene		DRO		GRO		Methylene Chloride	
	Min. Conc. (µg/L)	Max. Conc. (µg/L)	Min. Conc. (µg/L)	Max. Conc. (µg/L)	Min. Conc. (µg/L)	Max. Conc. (µg/L)	Min. Conc. (µg/L)	Max. Conc. (µg/L)
GCI Compound	2.3	360	150	2,700	110	20,000	NA	NA
SA 80	0.38 J	9.5	320	110,000 J	NA	NA	NA	NA
Tanker Shed	1.03	250	137	16,900	26	4,400	NA	NA
SA 78	5	2,800	NA	NA	6.8 J	16,000	100	100
SA 82	NA	NA	NA	NA	NA	NA	NA	NA
SA 88	NA	NA	NA	NA	NA	NA	NA	NA
SWMU 58/SA 73	NA	NA	100 J	19,000	NA	NA	NA	NA
Yakutat Hangar	NA	NA	NA	NA	NA	NA	NA	NA
NORPAC Hill	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
The Alaska DEC groundwater cleanup levels are used for GCI Compound, SA 80, and Tanker Shed. Ten times the Alaska DEC groundwater cleanup levels are used for SA 78, SA 82, SA 88, SWUM 58/SA 73, Yakutat Hangar, and NORPAC Hill.
conc. - concentration
DRO - diesel-range organics
GRO - gasoline-range organics
J - estimated value
max. - maximum
µg/L - microgram per liter
min. - minimum
NA - Not applicable to this site, because the chemical was not detected at concentrations greater than the Alaska DEC groundwater cleanup level.
SA - source area
SWMU - solid waste management unit

CLEANUP LEVELS:

Soil: Human health and ecological risk assessments established that existing concentrations of contaminants in soil do not pose an unacceptable risk. Therefore, no soil cleanup is necessary.

Groundwater: Cleanup levels are based on the use of groundwater as a drinking water source [18 AAC 75.345 (b)(1), Table C] or 10 times these levels if the groundwater is not reasonably expected to be a potential future source of drinking water [18 AAC 75.345 (b)(2)]. Cleanup levels based on the use of groundwater as a drinking water source are applicable to GCI Compound, SA 80, and Tanker Shed. Ten times these levels are applicable to the other seven sites.

Surface Water and Freshwater and Marine Sediment: The ecological risk assessment established that existing concentrations of contaminants in surface water and sediment do not pose an unacceptable risk. Therefore, no cleanup is necessary.

CLEANUP REMEDY:

Cleanup remedies were selected for each of the 10 petroleum-contaminated sites addressed in this decision document based on their ability to prevent future exposure to petroleum-related chemicals in soil and groundwater and reduce concentrations of petroleum-related chemicals in groundwater to levels below Alaska DEC groundwater cleanup levels over the long term. The cleanup remedies selected for each site are summarized in the following Table.

Site	Limited Groundwater Monitoring	Monitored Natural Attenuation and Institutional Controls	Product Recovery
GCI Compound		•	
SA 80		•	
Tanker Shed		•	•
SA 78		•	
SA 82	•		
SA 88	•		
SWMU 58/SA 73		•	
Yakutat Hangar	•		
NORPAC Hill	•		

REVIEW OF CLEANUP ACTION AFTER SITE CLOSURE:

Under 18 AAC 75.380(d)(1), the Alaska DEC may require the Navy to perform additional cleanup if new information is discovered which leads Alaska DEC to make a determination that the cleanup described in this Decision Document is not protective of human health, safety, and welfare or the environment, or if new information becomes available which indicates the presence of previously undiscovered contamination or exposure routes related to Navy activities.

ACCEPTANCE BY NAVY:

The Navy has agreed to the decisions outlined in this document.

Cindy L. O'Hare — May 9 2005

Cindy L. O'Hare, P.E. — Date
Adak BRAC Environmental Coordinator

Conditional Acceptance by State of Alaska

The State of Alaska has agreed to the decisions in this document on the express understanding that *nothing in this document may be construed to modify in any way the responsibilities of the Navy under its agreements with and written assurances to the owners of the sites or of adjacent properties, including without limitation Cooperative Agreement Number N6871104MDC4010 and the letter of James F. Bryant to Commissioner Mike Barton dated January 13, 2004.* In correspondence dated September 29, 2004, the Navy's counsel stated that the Navy has no disagreement with this understanding. In reliance upon the understanding and upon the Navy's indication that the understanding is a correct interpretation of this document, the state concurs in the decisions outlined in this document.

Jennifer Roberts
Contaminated Sites Program, Section Manager
Alaska Dept. of Environmental Conservation

May 20 2005
Date

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CONTENTS (Continued)

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ABBREVIATIONS AND ACRONYMS

AAC	Alaska Administrative Code
ACL	alternative cleanup level
ADEC	Alaska Department of Environmental Conservation
ARC	Adak Reuse Corporation
AST	aboveground storage tank
BEQ	Bachelors Enlisted Quarters
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CDAA	circular disposed antenna array
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CR	cancer risk
CSM	conceptual site model
cy	cubic yards
DD	decision document
DEC	Department of Environmental Conservation
DOT	Department of Transportation
DRO	diesel-range organics
EPA	U.S. Environmental Protection Agency
ESCA	Environmental Services Cooperative Agreement
FFA	Federal Facilities Agreement
FFS	focused feasibility study
GRO	gasoline-range organics
GW	groundwater
HI	hazard index
J	estimated value
JP	jet petroleum
mg/kg	milligram per kilogram
mg/L	milligram per liter
MNA	monitored natural attenuation
NA	not applicable
Navy	U.S. Navy
NPL	National Priorities List
NSGA	Naval Security Group Activity
OU A ROD	Record of Decision (ROD) for Operable Unit A
PCB	polychlorinated biphenyl
PQL	practical quantitation limits

ABBREVIATIONS AND ACRONYMS (Continued)

RRO	residual-range organics
SA	source area
SAERA	State-Adak Environmental Restoration Agreement
SARA	Superfund Amendments and Reauthorization Act of 1986
SVOC	semi-volatile organic compound
SW	surface water
SWMU	solid waste management unit
TAC	The Aleut Corporation
TAH	total aromatic hydrocarbons
TPH	total petroleum hydrocarbons
µg/L	microgram per liter
UST	underground storage tank

DECLARATION

1.0 INTRODUCTION

This Decision Document (DD) presents the selected cleanup actions and the supporting rationale for cleanup of the 10 free-product petroleum sites at the former Adak Naval Complex, Adak Island, Alaska. These sites pose no unacceptable risk to human health or the environment above target health goals, provided that institutional controls remain in effect. The decisions documented in this DD are based on the Administrative Record located at the offices of Engineering Field Activity, Northwest, Naval Facilities Engineering Command, in Poulsbo, Washington. The State of Alaska and U.S. Navy (Navy) have agreed to the decisions outlined in this document. The Navy is responsible for implementing the cleanup actions presented in this DD.

The former Adak Naval Complex is located on Adak Island, which is approximately 1,300 air miles southwest of Anchorage, Alaska, in the Aleutian Island chain (Figure 1-1). The 10 free-product petroleum sites located on the former Adak Naval Complex that are addressed in this DD are the following:

- GCI Compound, Underground Storage Tank (UST) GCI-1 (***GCI Compound***)
- Source Area (SA) 80, Steam Plant No. 4, USTs 27089 and 27090 (***SA 80***)
- Tanker Shed, UST 42494 (***Tanker Shed***)
- SA 78, Old Transportation Building, USTs 10583 and 10584 and Above-ground Storage Tanks (ASTs) (***SA 78***)
- SA 82, P-80/P-81 Buildings, USTs 10579 and 10587 and AST 10333 (***SA 82***)
- SA 88, P-70 Energy Generator, UST 10578 (***SA 88***)
- Solid Waste Management Unit (SWMU) 58, Heating Plant No. 6 ***(SWMU 58/SA 73***)
- SA 73, Heating Plant No. 6 (***SWMU 58/SA 73***)

- Yakutat Hangar, UST T-2039A (***Yakutat Hangar***)
- NORPAC Hill Seep Area (***NORPAC Hill***)

It should be noted that although SWMU 58 and SA 73 were established as separate sites, they are both located at Heating Plant No. 6, and are addressed as a single site. Figure 1-2 shows the location of each of the 10 sites addressed in this DD. Legal descriptions specifying the boundaries of each site are included as Appendix A. Site maps showing these boundaries are included at the end of this section for each site (Figures 1-3 and 1-11).

Alternative 2, Limited Groundwater Monitoring, is selected as the remedial alternative for the SA 82, SA 88, Yakutat Hangar, and NORPAC Hill sites. Alternative 3, Monitored Natural Attenuation and Institutional Controls, is selected as the remedial alternative for the GCI Compound, SA 80, Tanker Shed, SA 78, and SWMU 58/SA 73 sites. Alternative 4, Product Recovery, is also selected as a remedial alternative at the Tanker Shed site. In addition to the selected remedies, removal and/or assessment activities will be performed at SA 80, SA 82, SA 88, SWMU 58/SA 73, Tanker Shed, and Yakutat Hangar. A limited soil removal will be conducted at SA 82, and free-product recovery will be performed, as needed, at SA 80, SA 88, and SWMU 58/SA 73. Finally, additional soil samples will be collected at SA 80, Tanker Shed, and SWMU 58/SA 73; additional groundwater samples will be collected from SA 80, Tanker Shed, SA 88, and SWMU 58/SA 73; and additional surface water samples will be collected at SWMU 58/SA 73 and Yakutat Hangar. The selected cleanup alternatives and additional removal and assessment activities for the 10 petroleum-contaminated sites that do not pose a risk above target health goals are discussed in more detail in Sections 9 and 10.

This DD was developed in accordance with State of Alaska regulations governing petroleum-release sites, the Alaska Department of Environmental Conservation (DEC) Oil and Other Hazardous Substances Pollution Control Regulations (18 Alaska Administrative Code [AAC] 75).

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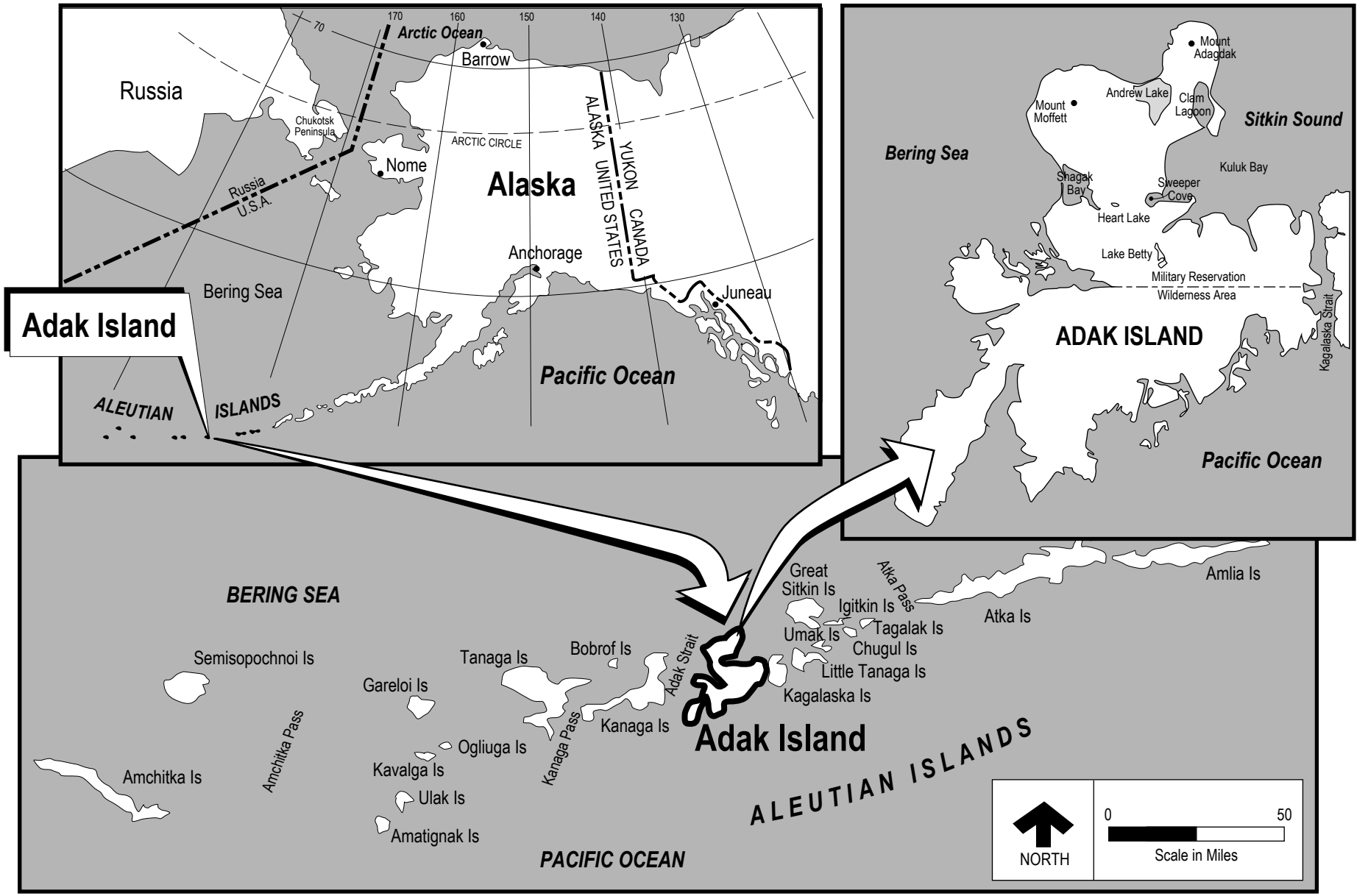
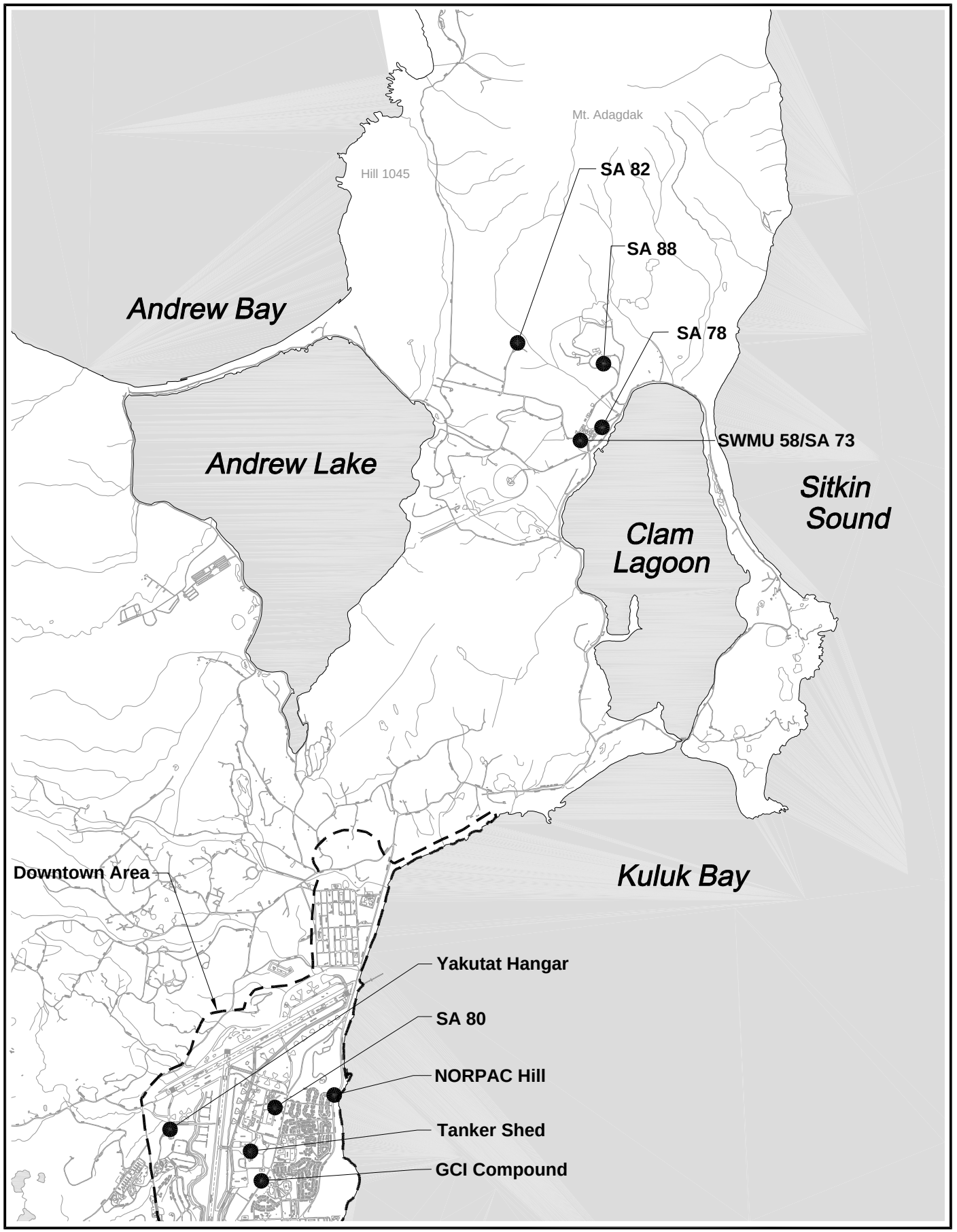


U.S.NAVY	**Figure 1-1** **Adak Island Vicinity**	Delivery Order 0037 Adak Island, AK DECISION DOCUMENT



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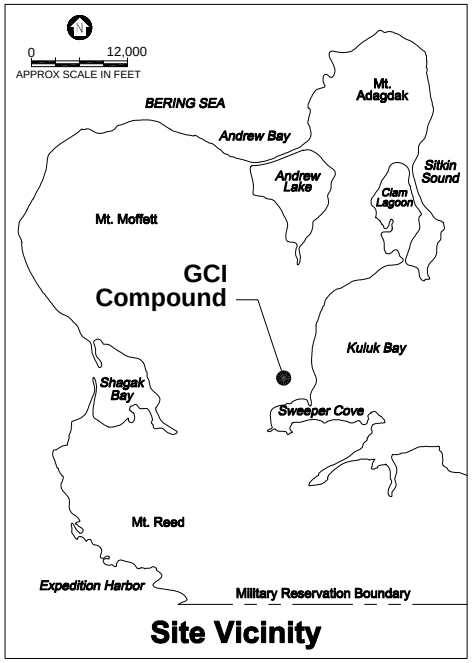
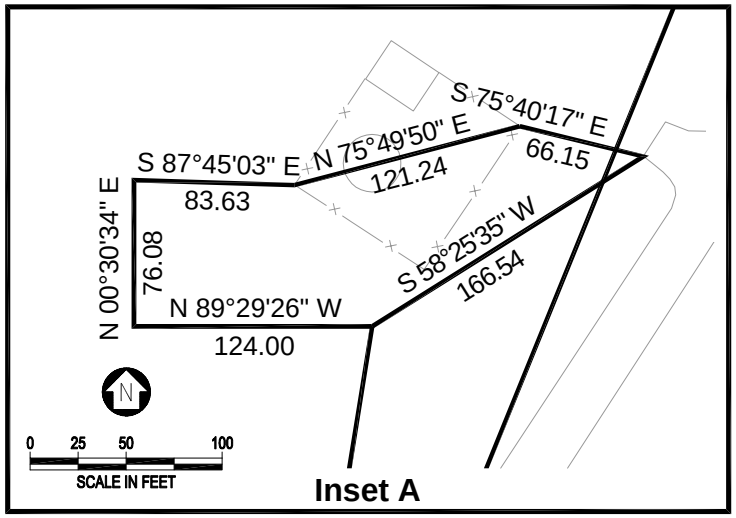
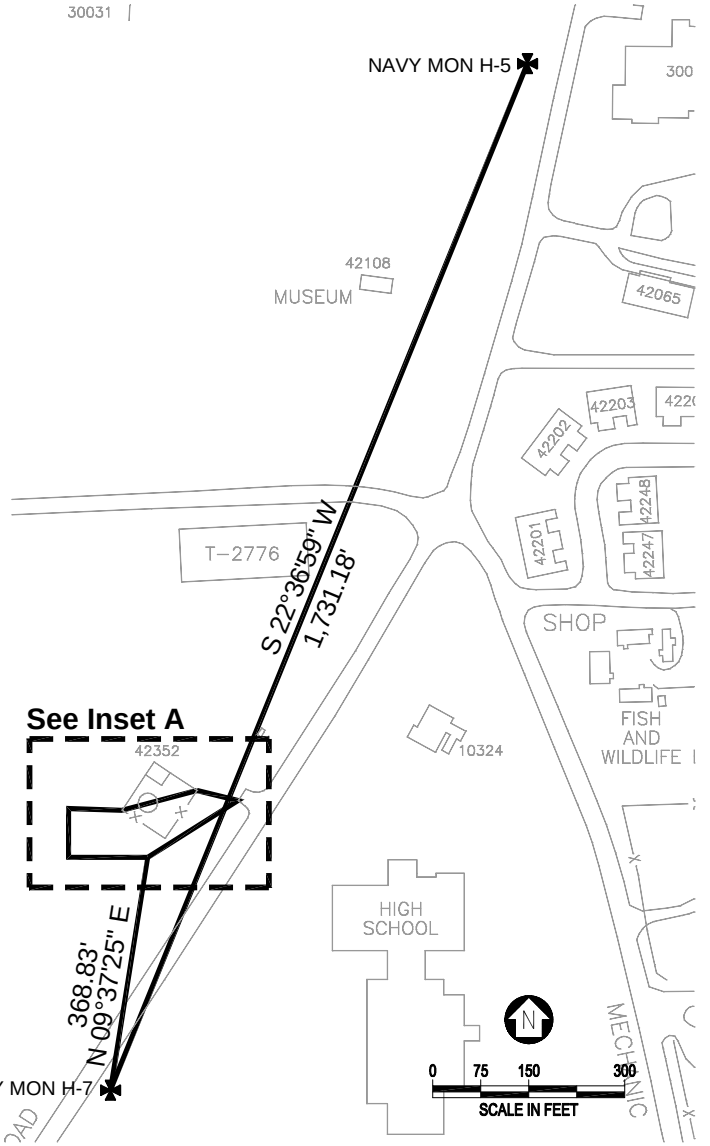
SCALE IN FEET

Figure 1-2
Location of Petroleum-Contaminated Sites with No Unacceptable Risk, Adak AK

Delivery Order 0037
Adak Island, AK
DECISION DOCUMENT







U.S. NAVY	Scale as Shown	**Figure 1-3** **Legal Boundaries** **GCI Compound**	Delivery Order 0037 Adak Island, AK DECISION DOCUMENT

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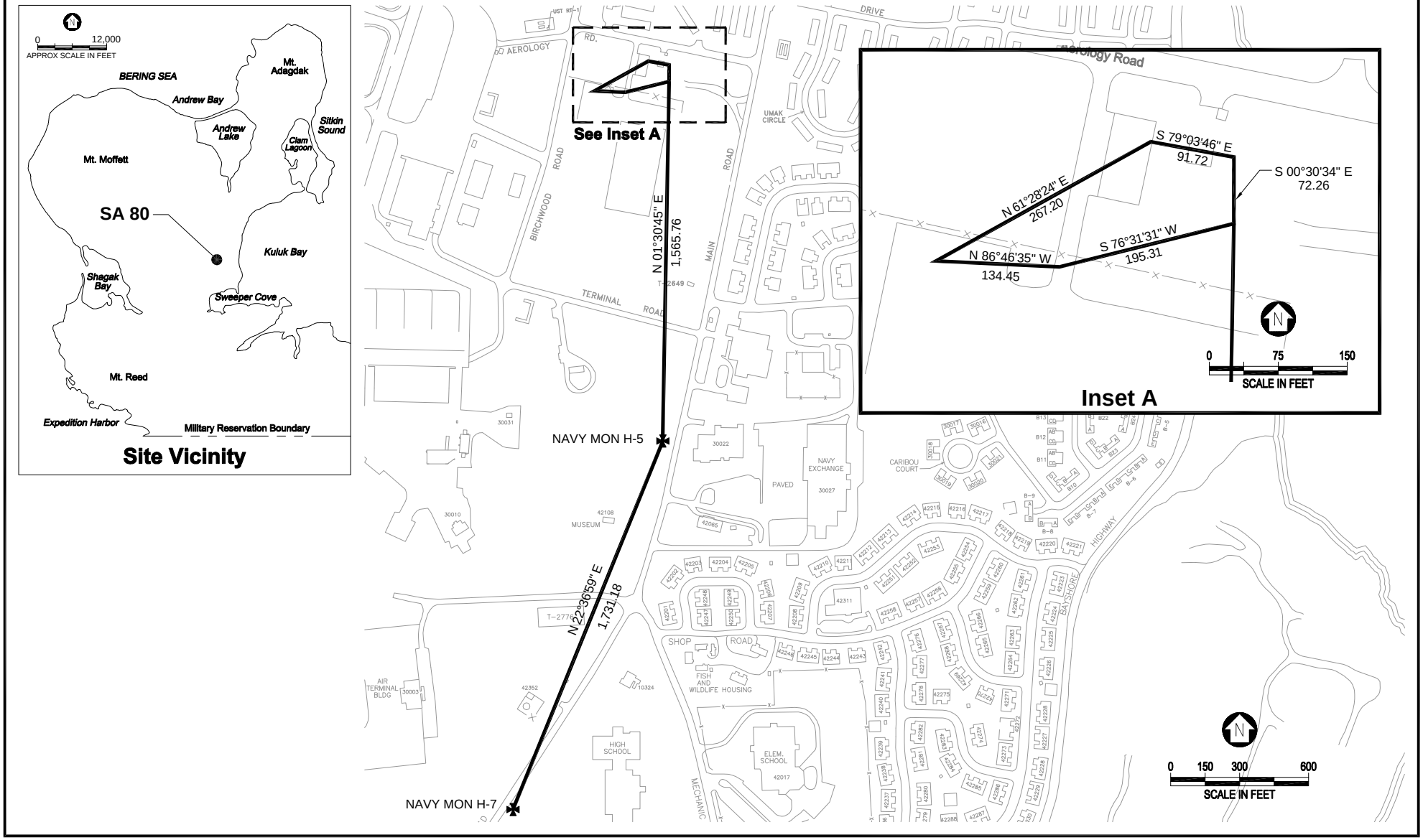

U.S. NAVY	Scale as Shown	**Figure 1-4** **Legal Boundaries** **SA 80, Steam Plant No. 4**	Delivery Order 0037 Adak Island, AK DECISION DOCUMENT

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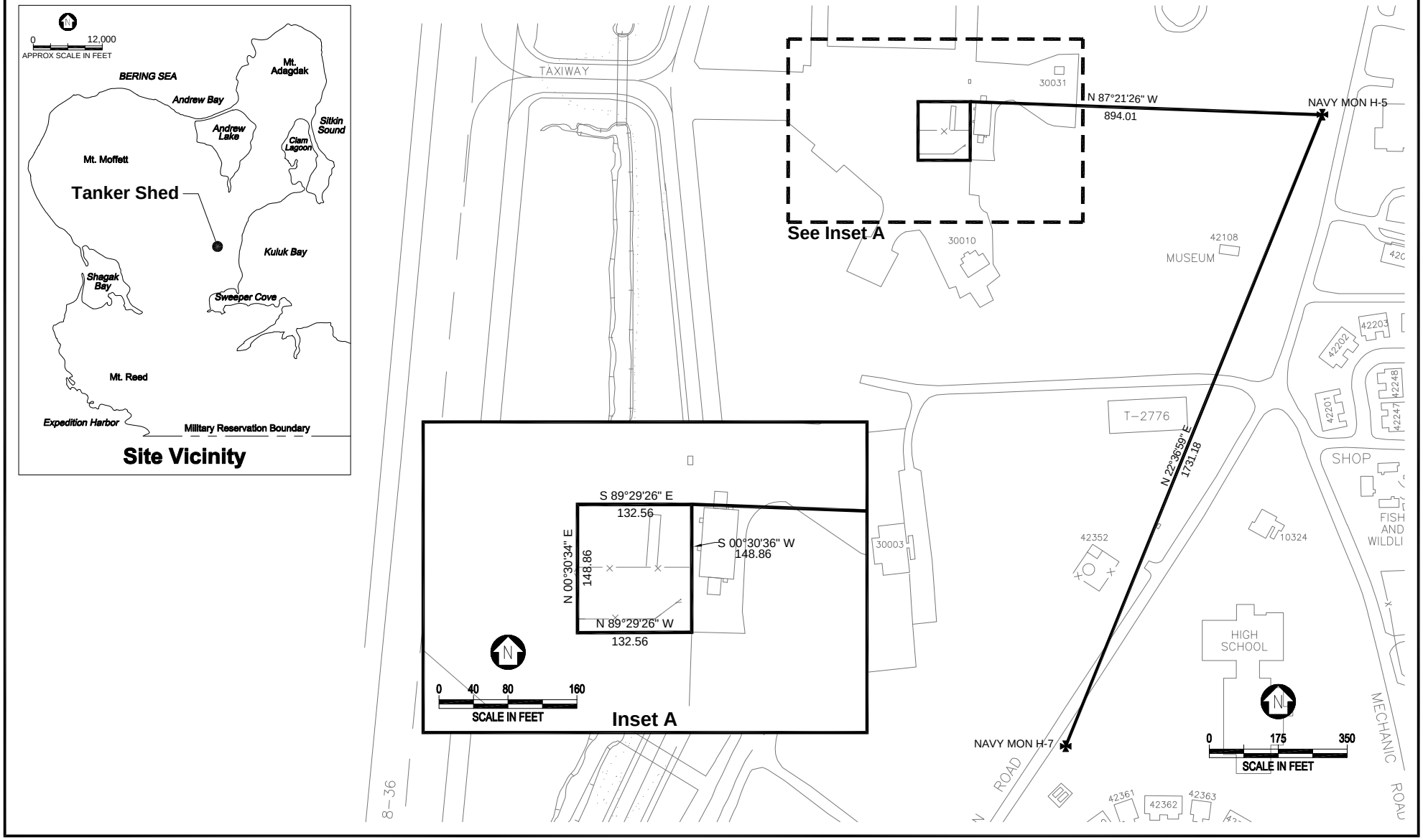

U.S. NAVY	Scale as Shown	**Figure 1-5** **Legal Boundaries** **Tanker Shed**	Delivery Order 0037 Adak Island, AK DECISION DOCUMENT

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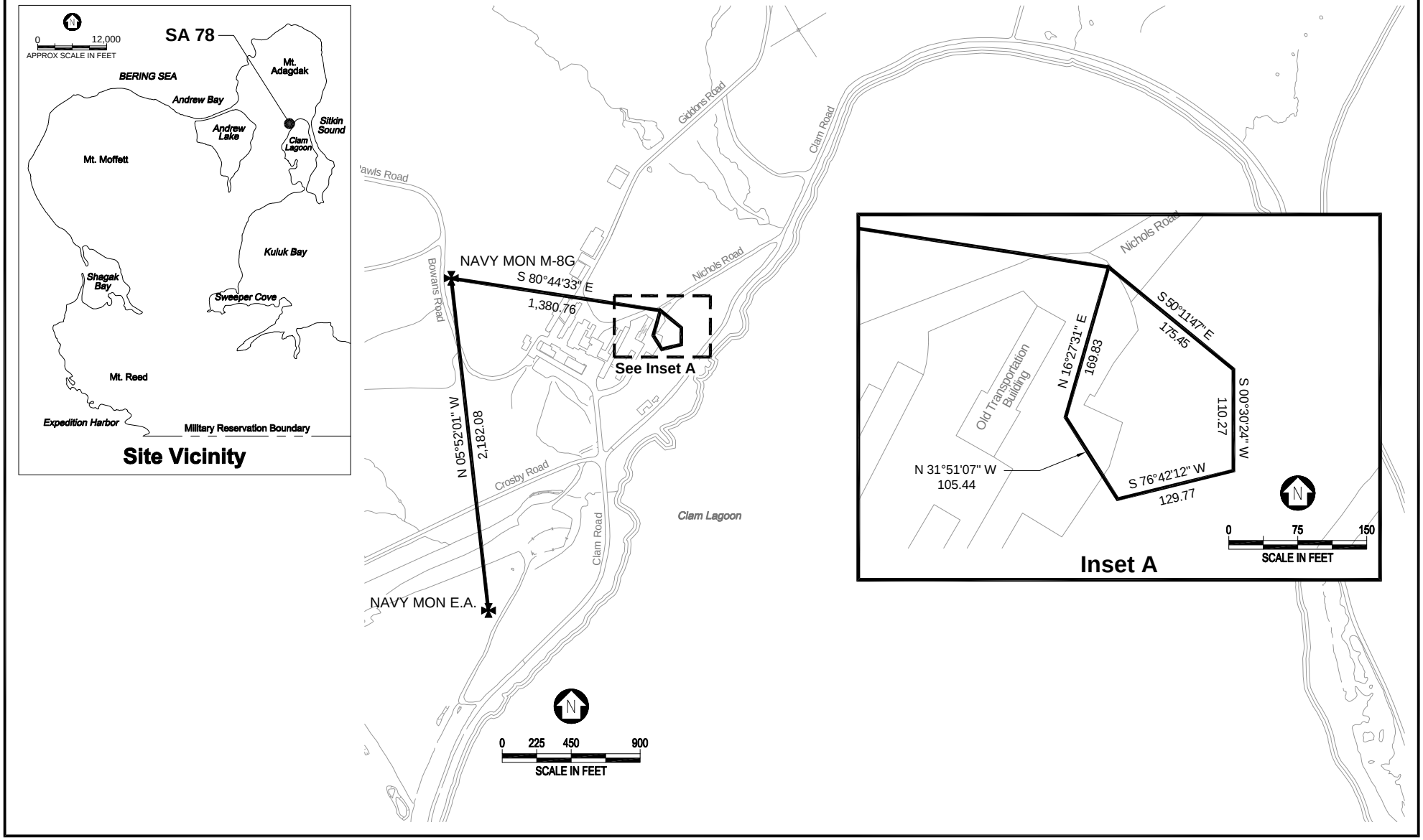

U.S. NAVY	Scale as Shown	**Figure 1-6** **Legal Boundaries** **SA 78, Old Transportation Building**	Delivery Order 0037 Adak Island, AK DECISION DOCUMENT

FILENAME: T:\ADAK\IDIQ\Sub-Tasks\DO 37\DD\FIG 1-6 SA 78.dwg
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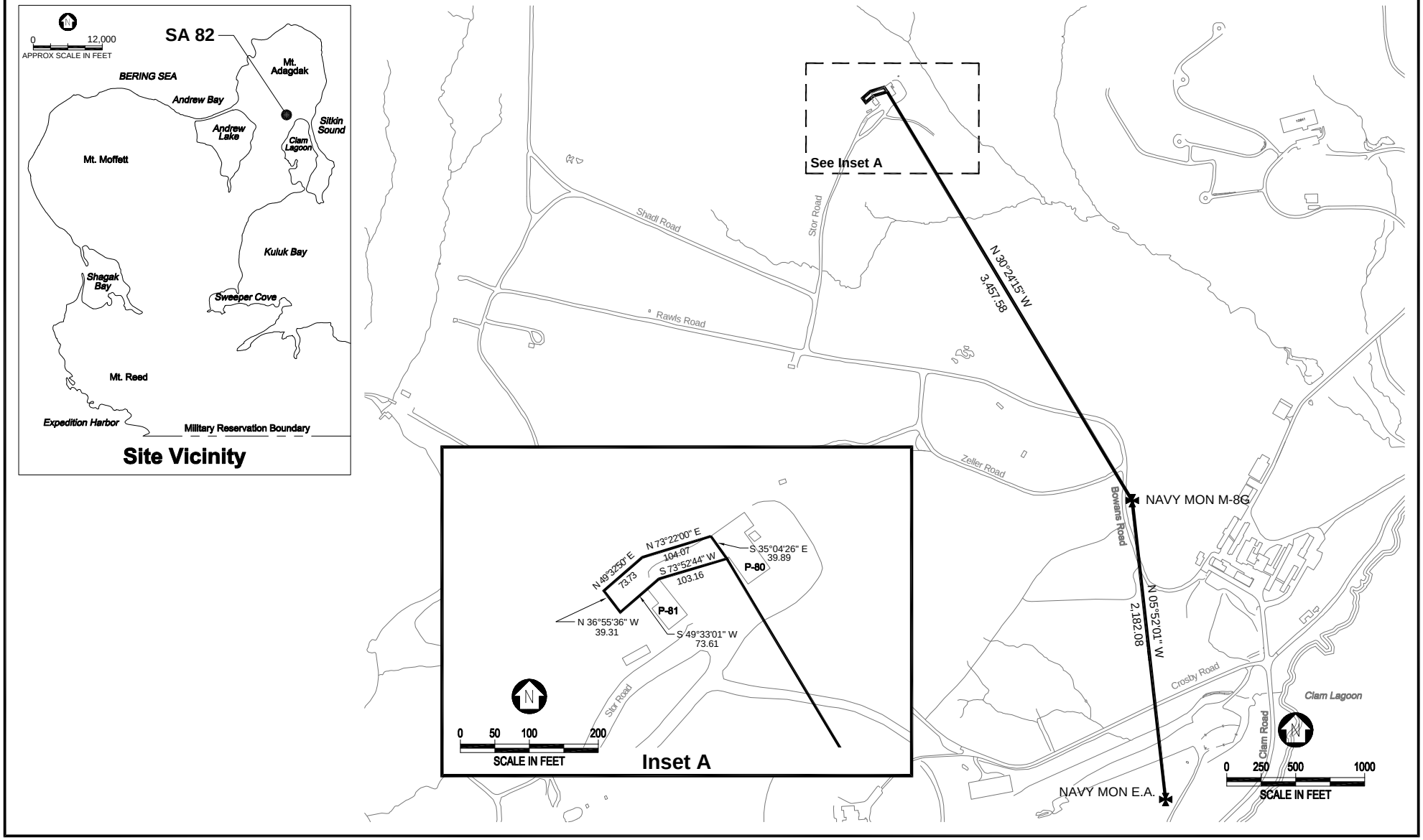

U.S. NAVY	Scale as Shown	**Figure 1-7** **Legal Boundaries** **SA 82, P-80/P-81 Buildings**	Delivery Order 0037 Adak Island, AK DECISION DOCUMENT

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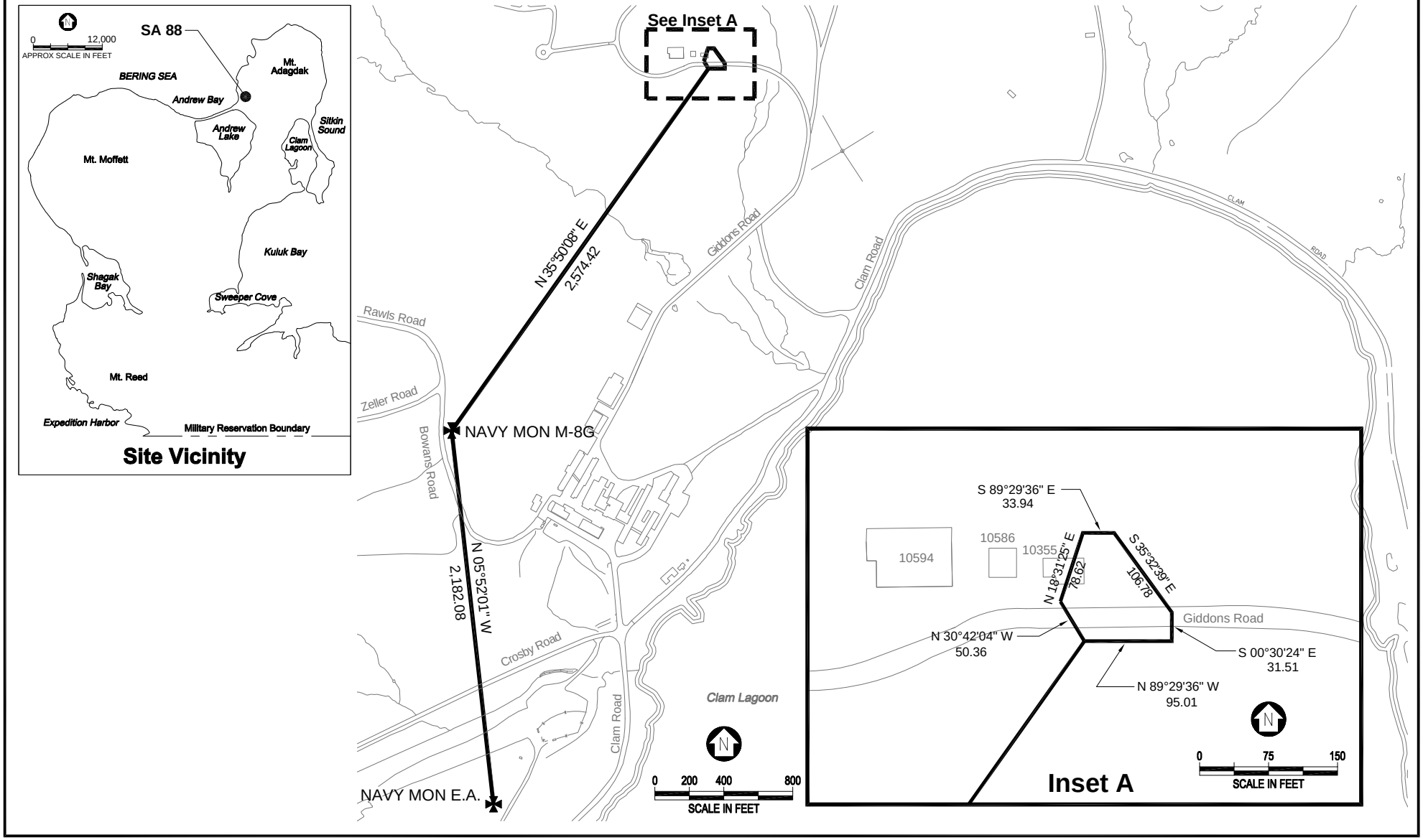

U.S. NAVY	Scale as Shown	**Figure 1-8** **Legal Boundaries** **SA 88, P-70 Energy Generator**	Delivery Order 0037 Adak Island, AK DECISION DOCUMENT

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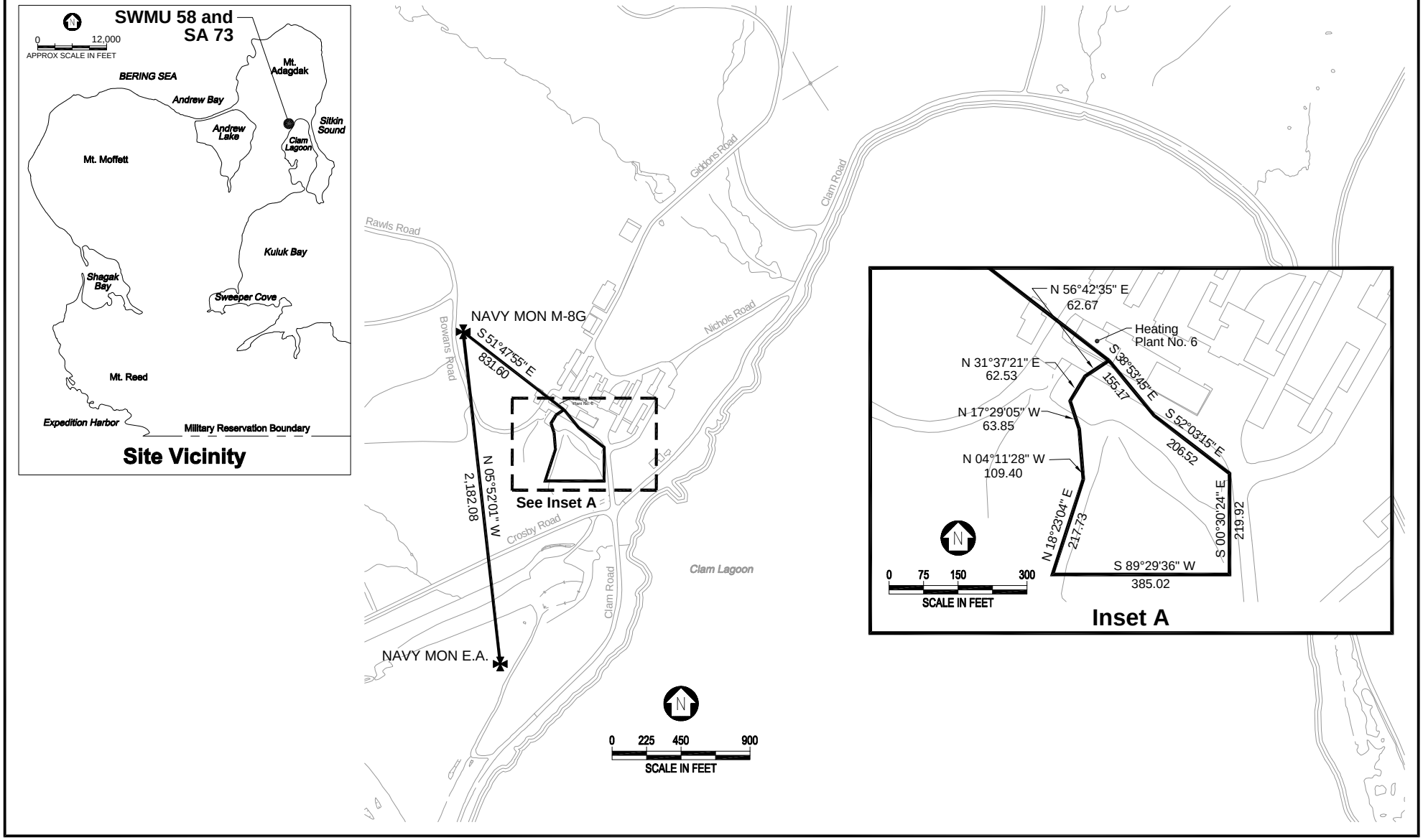

U.S. NAVY	Scale as Shown	**Figure 1-9** **Legal Boundaries** **SWMU 58 and SA 73, Heating Plant No. 6**	Delivery Order 0037 Adak Island, AK DECISION DOCUMENT

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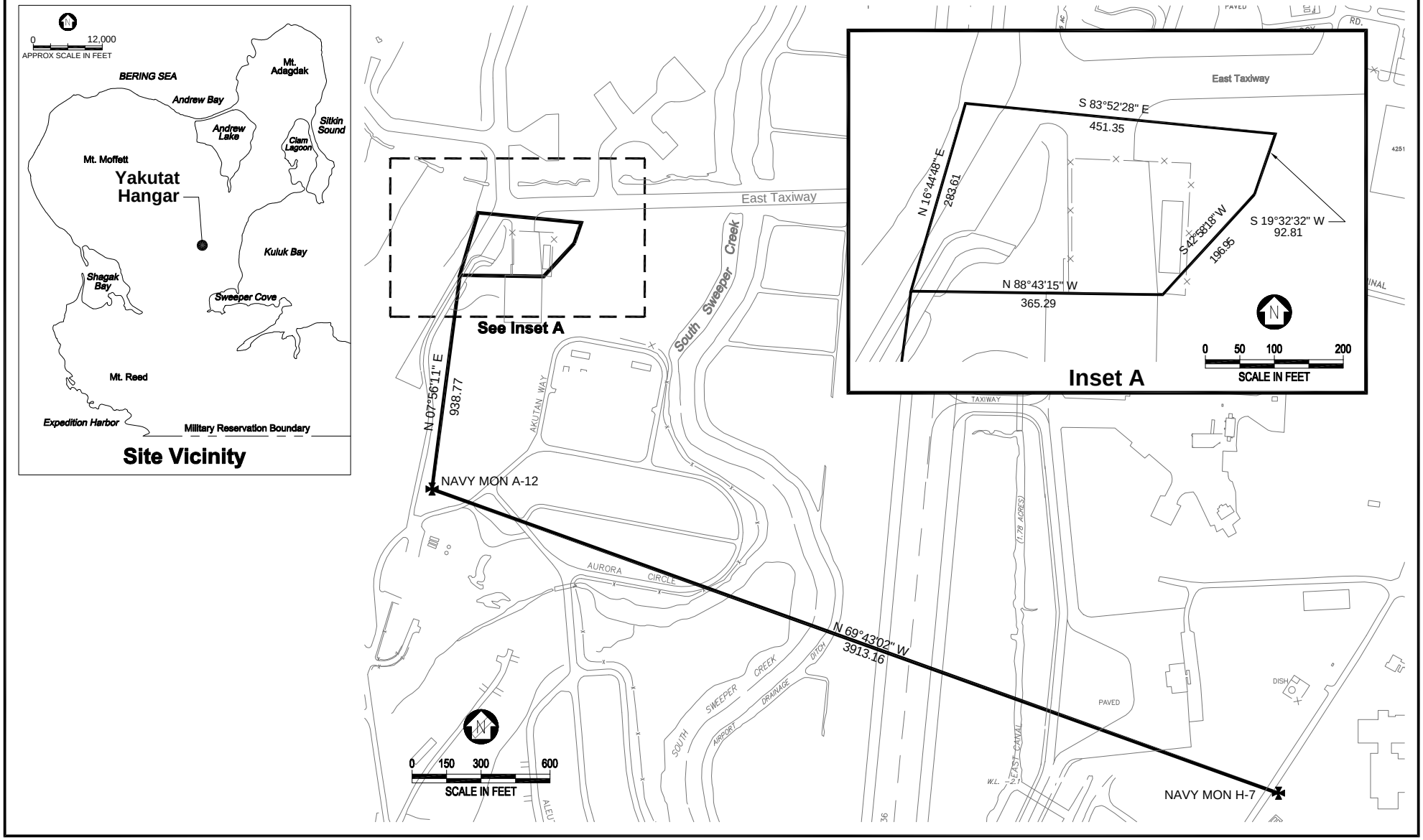

U.S. NAVY	Scale as Shown	**Figure 1-10** **Legal Boundaries** **Yakutat Hangar**	Delivery Order 0037 Adak Island, AK DECISION DOCUMENT

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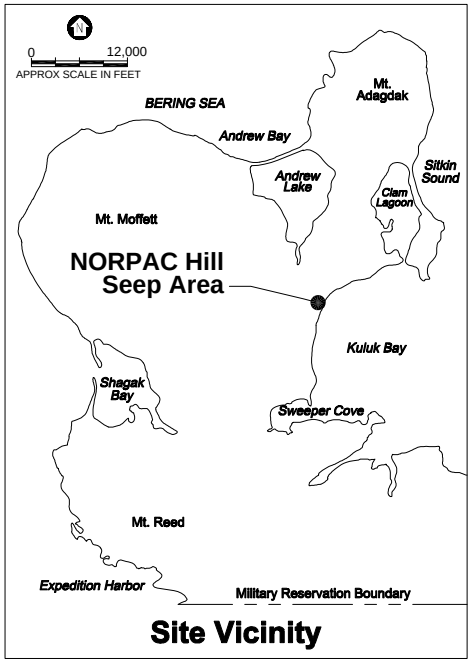

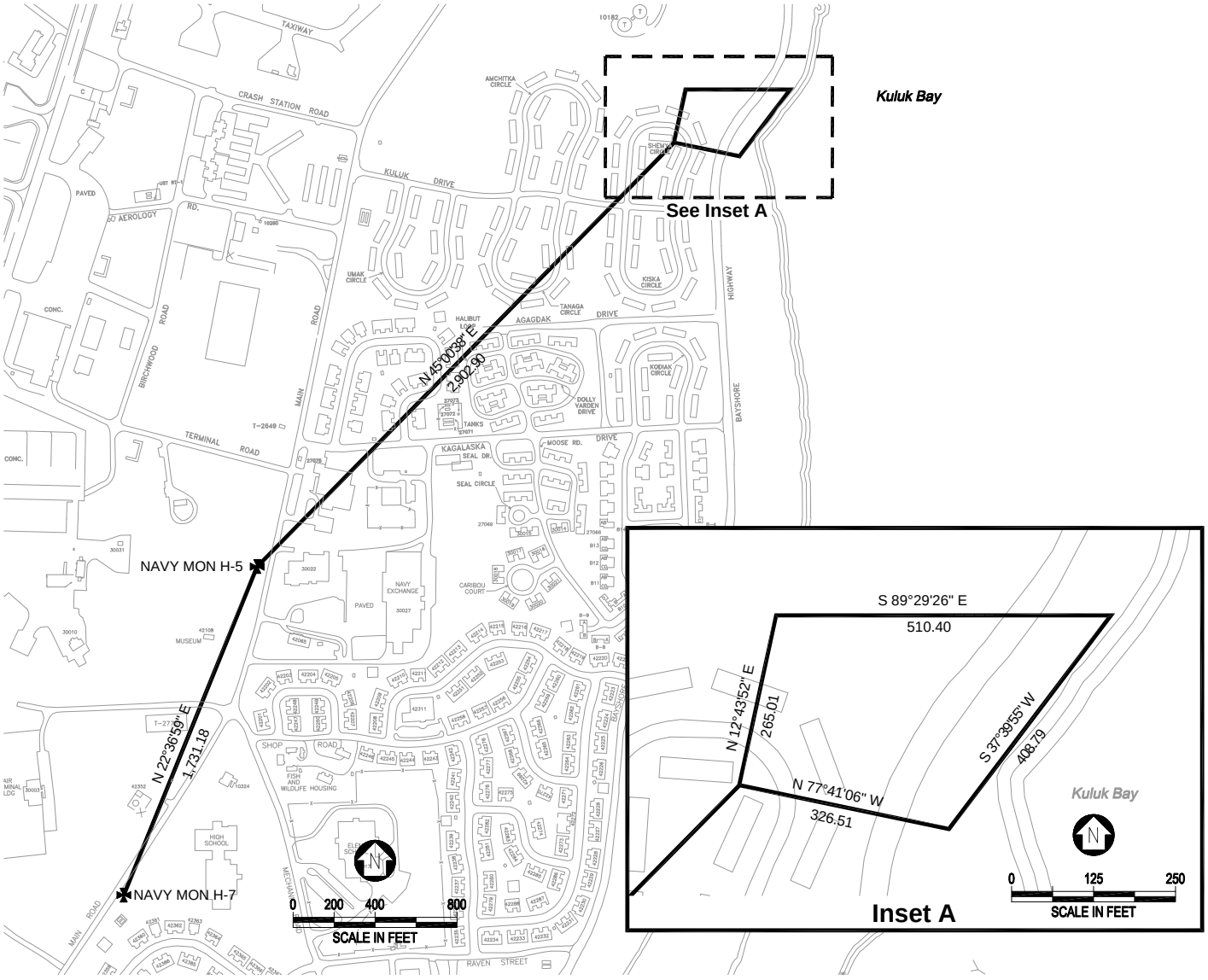

U.S. NAVY	Scale as Shown	**Figure 1-11** **Legal Boundaries** **NORPAC Hill Seep Area**	Delivery Order 0037 Adak Island, AK DECISION DOCUMENT

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2.0 BACKGROUND

General background information for the 10 free-product petroleum sites is provided in this section. This background information includes site history, regulatory history, and release history; physical characteristics important to the selection of a cleanup action; a summary of the contaminants released at each site and the media impacted by the release; a description of the cleanup activities that have been performed at each site; current and expected future land use; groundwater use; and institutional controls and excavation restrictions. Additional information for each site is provided in Part 2 of the site characterization report (URS 2004a).

2.1 SITE HISTORY

Military presence on Adak began in 1942 with its occupation as a staging area to mount a counter-offensive to dislodge the Japanese from Attu and Kiska Islands. The Navy presence at Adak was officially recognized by Public Land Order 1949, dated August 19, 1959, which withdrew the northern portion of Adak Island, comprising approximately 76,800 acres, for use by the Navy for military purposes. The Navy also used the base to conduct a variety of Cold War-era military activities. Naval Air Facility Adak was on the list of Department of Defense installations recommended for closure in 1995, and that recommendation became final when Congress did not disapprove the list. The active Navy mission ceased, and the base operationally closed on March 31, 1997.

From April 1997 through September 2000, critical facilities such as the power plant, airfield, and environmental cleanup systems were operated by the Navy through a caretaker contractor. In June 1998, the Navy entered into a lease with the Adak Reuse Corporation (ARC), the designated local redevelopment authority, that authorized ARC to use or sublease property in the developed core of the military reservation for commercial reuse purposes. In October 2000, ARC commenced operation of community facilities such as the airfield and utility systems in support of reuse activities under the authority of this lease.

In September 2000, the federal government entered into a land transfer agreement with The Aleut Corporation (TAC), a Native corporation, as documented in the Agreement Concerning the Conveyance of Property at the Adak Naval Complex, Adak, Alaska. This agreement set forth the terms and conditions for the conveyance of approximately 47,000 acres of the former Adak Naval Complex property to TAC. The actual conveyance or transfer of property occurred on March 17, 2004. The land transfer includes all of the downtown area, housing units, and industrial facilities. Excluded from this transfer are any offshore islands, islets, rocks, reefs, and

spires; those fixtures and equipment owned by the United States and associated with the airfield; those improvements owned by the United States and managed by the Federal Aviation Administration (FAA); and those improvements owned by the United States and managed by the Fish and Wildlife Service. The Aleut Corporation transferred the portion of the former Naval Air Facility known as Adak Airport and associated facilities and aviation easements, not including FFA navigation aids or weather reporting equipment, to the State of Alaska. Therefore, the Alaska Department of Transportation (DOT) currently owns the Tanker Shed site, and TAC owns the remaining nine sites addressed by this DD.

The transferred land has institutional controls currently in place as specified in the Interim Conveyance document. The institutional controls that have been implemented at the former Adak Naval Complex through the final institutional control management plan (U.S. Navy 2004) include:

1. Land use restrictions, primarily restricted to areas designated for commercial or industrial use

2. Notification of intrusive soil excavation activities

3. Groundwater restrictions that prohibit use of the downtown aquifer as a drinking water resource

4. Annual inspection of institutional controls and reporting

These institutional controls are discussed in more detail in Section 2.7.

2.1.1 Site Regulatory History

Investigation and cleanup of petroleum-contaminated sites at the former Adak Naval Complex have been ongoing since 1986. Adak was initially proposed for placement on the National Priorities List (NPL) in 1992 and was officially listed in 1994. The Navy, as lead agency, entered into a three-party Federal Facilities Agreement (FFA) with the U.S. Environmental Protection Agency (EPA) and Alaska DEC as well as a two-party State-Adak Environmental Restoration Agreement (SAERA) with the Alaska DEC to facilitate investigation and cleanup activities.

In 1993 the Navy, EPA, and Alaska DEC signed the FFA, which incorporates the EPA's cleanup process under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986

(SARA). The CERCLA exclusion of petroleum as a hazardous substance required that cleanup of petroleum-related chemicals would follow State of Alaska regulations. Therefore, the FFA stated that petroleum-contaminated sites, such as those containing USTs and leaking underground fuel lines, would be evaluated under a separate two-party agreement between the Navy and the State of Alaska. This agreement, the SAERA, was signed in April 1994.

The former Adak Naval Complex was divided into two operable units (OU), OU A and OU B, for investigation and cleanup activities. OU A includes CERCLA and petroleum sites, and OU B includes ordnance explosive sites. A total of 180 sites were evaluated within OU A. The FFA listed 84 CERCLA sites, and the SAERA listed 128 petroleum sites. The number of CERCLA sites plus the number of petroleum sites is greater than 180, because some sites that were originally listed as CERCLA sites were evaluated under SAERA and some sites were evaluated under both CERCLA and SAERA. In May 1997, the Navy and Alaska DEC agreed to integrate the cleanup decision process for petroleum sites with the cleanup decision process being conducted for hazardous substance release sites under CERCLA. As a result, the Record of Decision (ROD) for Operable Unit A (OU A) was prepared for both the petroleum-contaminated sites and the hazardous-substance-release sites and signed by the Navy, the EPA, and the Alaska DEC in 2000.

The OU A ROD selected final or interim remedies for each of the 128 petroleum-contaminated sites identified on Adak Island. The interim remedy, free-product recovery, was selected for 14 sites that contained measurable quantities of free-phase petroleum product. In addition, the OU A ROD specified that these 14 sites would require future remedy selection pursuant to the two-party SAERA. To clarify regulatory authority, the OU A ROD was amended in 2003 to remove these petroleum sites and 48 others with further action from CERCLA authority. Therefore, final remedies for the 14 petroleum-contaminated sites will be selected in accordance with Alaska State regulation 18 AAC 75.325 through AAC (Alaska Administrative Code) 75.390 which provides the regulatory procedures and requirements for petroleum cleanup decisions.

This DD addresses 10 of the 14 free-product recovery sites. These 10 sites (listed in Section 1.0) are the sites where the remaining petroleum-related chemicals pose no risk to human health or the environment above target health goals, provided that institutional controls remain in effect. The remaining four sites are those where petroleum-related chemicals pose a potential risk to human health or the environment above target health goals and will be addressed in separate documentation.

2.1.2 Site Release History

The suspected and known sources of petroleum hydrocarbons in soil, groundwater, sediment, and surface water at these 10 sites and the release history are summarized in Table 2-1. In most cases, releases of petroleum hydrocarbons at the 10 sites appear to be related to USTs, ASTs, or piping associated with the USTs and ASTs historically used at the site. Other potential sources of petroleum hydrocarbon contamination are oil/water separators located at SWMU 58/SA 73 and Tanker Shed, a vehicle wash rack located at Tanker Shed, and fuel pipelines (unrelated to site USTs and ASTs) located at the GCI Compound, SA 80, and NORPAC Hill sites. Documentation of releases was found for only five of the 10 sites: GCI Compound, SA 80, SA 78, and SWMU 58/SA 73. The source of the petroleum hydrocarbons released to the environment at the other five sites is not documented. Additional information on the release history at each site is provided in part 2 of the site characterization report (URS 2004a).

2.2 PHYSICAL CHARACTERISTICS

Adak Island experiences a polar maritime climate characterized by persistently overcast skies, high winds, frequent and often violent storms, and a narrow range of temperature fluctuation throughout the year. The average total annual precipitation for Adak Island is about 60 inches, most of which falls as rain in the lower elevations. Average monthly precipitation varies from a low of about 3 inches during June and July to a high of 7 to 8 inches during November and December. Snowfall averages over 100 inches a year at sea level.

Adak Island consists primarily of volcanic and sedimentary rocks with a relatively thin mantle of unconsolidated material (generally less than 10 feet) covering much of the bedrock. Only the downtown area is known to have a thick sequence of unconsolidated sandy material (greater than 100 feet). A large portion of the unconsolidated sandy material from the downtown area was used to fill a lagoon that formerly occupied the area now containing the airfield. Surficial deposits across the island were formed primarily by three geologic processes: glaciation, volcanic activity, and erosion and deposition. The northern region of Adak is dominated by the remnants of three volcanoes.

The hydrogeology of northern Adak Island is limited by the low permeability of native surface materials and bedrock, steep slopes, and discontinuity of sporadically located permeable zones. Most undisturbed areas are mantled by tephra (ash) deposits. Combined with steep slopes, these conditions offer little opportunity for infiltration. Additionally, the combination of a thin mantle of unconsolidated material over poorly jointed bedrock results in groundwater that is intermittent

and not laterally extensive. The most notable exception is the laterally extensive flat area with permeable soil located in the downtown area.

Groundwater levels are generally 5 to 20 feet below land surfaces in different areas within the downtown area. Water levels in wells typically vary 0 to 2 feet during different seasons. Water table responses to tidal fluctuations are most apparent near tidally affected surface water bodies such as Kuluk Bay, Sweeper Cove, and South Sweeper Creek. Tidal effects in groundwater levels can typically be measured within a couple hundred feet of the surface water body.

2.3 DESCRIPTION OF CONTAMINANTS AND MEDIA IMPACTED

Decisions documented in this DD are based upon information gathered from various environmental field investigations performed by the Navy at the 10 petroleum-contaminated sites between 1991 and 2002. These investigations included, but were not limited to, site assessments conducted to evaluate site conditions during tank removals, site investigations to evaluate subsurface conditions and investigate potential sources of contamination, and groundwater investigations to evaluate concentrations of petroleum compounds and natural attenuation parameters. Based on these investigations, the media impacted by petroleum hydrocarbon releases at the 10 petroleum-contaminated sites include soil, groundwater, sediment, and surface water. The concentrations of petroleum hydrocarbons in both soil and groundwater exceeded the applicable Alaska DEC cleanup levels at six sites: GCI Compound, SA 80, Tanker Shed, SA 78, and SWMU 58/SA 73. Only the concentrations in soil exceeded the applicable DEC cleanup levels at four sites: SA 82, SA 88, Yakutat Hangar, and NORPAC Hill. Petroleum hydrocarbons were detected in surface water at SWMU 58/SA 73. Petroleum hydrocarbons were detected in freshwater sediments at SA 78 and SWMU 58/SA 73, and in marine sediments at SA 78 and NORPAC Hill. Alaska regulations have not established numerical cleanup criteria for individual petroleum hydrocarbons in surface water and sediment. Therefore, surface water and sediment monitoring would be conducted to evaluate the impact of terrestrial cleanup activities on downgradient aquatic environments. A summary of the impacted media is provided in Table 2-2.

2.4 CLEANUP ACTIVITIES PERFORMED TO DATE

Cleanup activities that have been performed to date at the 10 petroleum-contaminated sites are summarized in Table 2-3. Cleanup activities that have been implemented include:

- UST, AST, oil/water separator, and associated piping removals
- Contaminated soil excavation
- Recovery of groundwater/free product during tank removals
- Free-product removals
- Annual groundwater monitoring
- Natural attenuation monitoring

In addition, corrective actions were implemented at SWMU 58/SA 73 and Yakutat Hangar. French drains were installed in drainage ditches affected by free product at both sites, and the ditches were then backfilled to grade. The backfill placement into the drainage ditches eliminated human and ecological exposures to contaminated surface soils. Additional information on the cleanup activities performed at each of the sites is provided in part 2 of the site characterization report (URS 2004a).

2.5 LAND USE

The former Adak Naval Complex had two main developed areas: Naval Air Facility (NAF) Adak and Naval Security Group Activity (NSGA). Land uses at NAF Adak, located in the developed downtown area, include aviation, port operations, light industrial, administrative, commercial/recreational, and residential. NSGA is located approximately 5 miles northeast of NAF Adak, on the northwestern shore of Clam Lagoon (Figure 1-2). The primary land uses during operations at the facility included light industrial, administrative, and residential.

Historical, current, and future land use information for the 10 petroleum-contaminated sites is summarized in Table 2-4. ARC, the designated local redevelopment authority, has established the acceptable future uses of land transferred from the military to TAC in the Adak Reuse Plan (ARC 2000). These land uses are commercial reuse, aviation reuse, residential reuse, and public facilities reuse. The sites classified as commercial reuse include GCI Compound, SA 78, SA 82, SA 88, and SWMU 58/SA 73. The sites classified as aviation reuse include SA 80, Tanker Shed, and Yakutat Hangar. A portion of NORPAC Hill is classified as residential reuse, and the remainder is classified as public facilities reuse. Locations of the 10 petroleum-contaminated sites are provided on Figure 1-2.

2.6 GROUNDWATER USE

Groundwater has not historically been used as a drinking water source on Adak Island, nor is it currently being used. Future human use of groundwater on Adak Island as a drinking water source is not expected because of the following:

- Surface water from Lake Bonnie Rose is used as the sole drinking water source on Adak Island
- The Interim Conveyance Document issued by the United States to TAC imposes institutional controls that prohibit the future use of the downtown groundwater aquifer as a drinking water source
- Groundwater contained with the volcanic materials found outside the downtown area on Adak Island is limited in quantity to the extent that pumping would not produce sufficient yield to support a hypothetical water supply well

According to Alaska regulations (18 AAC 65.350), groundwater is considered to be a drinking water source by the State of Alaska unless it can be demonstrated that the groundwater is not currently being used as a drinking water source and groundwater is not a reasonably expected potential future source of drinking water. As stated above, groundwater is not currently being used as a drinking water source on Adak, institutional controls are in place to prevent the use of the downtown aquifer as a future drinking water resource, and groundwater outside the downtown area would not produce sufficient yield to support a hypothetical water supply well. In addition, well drilling and excavation for the purpose of installing a private or public domestic use well are strictly prohibited in the downtown area. The downtown area is periodically inspected by the Navy to determine if there is evidence of domestic wells in use.

Although institutional controls are in place preventing the use of the downtown aquifer, groundwater in this area is still considered to be a potential future source of drinking water if all of the following conditions apply:

1. The site is located within the downtown area where groundwater yield is sufficient to support a water supply well
2. The occurrence of groundwater is more than 10 feet below ground surface (ft bgs) (i.e., the minimum well protection and source water protection requirements

established for public water systems by Alaska regulations [18 AAC 80.015] could be met)

3. Saltwater would not be drawn into a hypothetical municipal water supply well during pumping.

The sites discussed in this decision document where groundwater is considered to be a reasonably expected potential future source of drinking water are GCI Compound, SA 80, and Tanker Shed. Groundwater cleanup levels identified for these sites are those presented in Table C of Alaska Regulation 18 AAC 75.345(b)(1).

The sites where groundwater is not considered a reasonably expected potential future drinking water source are SA 78, SA 82, SA 88, SWMU 58/SA 73, Yakutat Hangar, and NORPAC Hill. Groundwater cleanup levels identified for these sites are 10 times those presented in Table C of Alaska Regulation 18 AAC 75.345(b)(1). The rationale for applying these less stringent groundwater cleanup levels at these sites is as follows:

1. The SA 78, SA 82, SA 88, and SWMU 58/SA 73 sites are located at the former NSGA Facility outside of the downtown aquifer area. Groundwater yield in this area is not sufficient to support a domestic water supply well.

2. The depth to groundwater at the Yakutat Hangar site is less than 10 feet below ground surface (bgs). Therefore, the minimum well protection and source water protection requirements established for public water systems by Alaska regulations [18 AAC 80.015] could not be met at this site.

3. The NORPAC Hill site is located adjacent to Kuluk Bay. Hypothetical water supply wells located at this site would potentially draw in saltwater from the bay during groundwater pumping.

Additional information on groundwater can be found in the 1995 groundwater study report (URS 1995a). Future use of groundwater as a drinking water source is summarized in Table 2-4 for all 10 sites discussed in this decision document.

2.7 INSTITUTIONAL CONTROLS

Institutional controls are measures to prevent or limit exposure to hazardous substances left in place at a site, or assure effectiveness of the chosen remedy until cleanup levels are achieved.

Institutional controls are placed on property where contaminants remain at levels above regulatory requirements for cleanup, and where exposure pathways, if they exist, may cause harm to human health and the environment. For the 10 petroleum release sites addressed in this DD, the institutional controls specified in the Interim Conveyance document include land use restrictions, excavation restrictions, and groundwater restrictions. The land use restrictions and excavation restrictions are discussed in more detail below.

2.7.1 Land Use Restrictions

The Alaska Oil and Hazardous Substances Pollution Control regulations (18 AAC 75) require cleanup of hazardous substances that have been released into the environment to a degree that is determined to be protective of human health and the environment. The purpose of institutional controls is to ensure compliance with land use assumptions used to establish cleanup levels. Residential land use, including permanent or temporary living accommodations, child-care facilities, schools, playgrounds, and hospitals are prohibited at the 10 sites discusses in this DD by the Interim Conveyance document.

2.7.2 Excavation Restrictions

There are two types of soil excavation restrictions implemented at the former Adak Naval Complex through the Interim Land Conveyance document, excavation notifications and absolute excavation prohibitions. Excavation notification is required for proposed excavations below 2 feet at each of the institutional controls sites, including the 10 sites discussed in this DD. The notifications will be evaluated by the Navy to determine whether a proposed project at a site is consistent with the land use assumptions. The notifications are an additional tool for the Navy to receive timely information to monitor land use restrictions. The primary purpose of the Excavation Notification is to apprise the Navy of changes to land use. Excavation notification also ensures that contaminated materials excavated during site development activities are properly managed.

An excavation notification will be submitted by the requestor to the Navy at least three working days in advance of the planned excavation date. After the Navy reviews the request, the original request will be returned to the requester approved or disapproved. The Navy will retain a copy. An approved Excavation Notification must be in the possession of personnel on site during excavation activities. The Excavation Notification will expire after 120 days. If an Excavation Notification extension is necessary, the requester shall contact the Navy one week before the current Excavation Notification expires. Notifications may be mailed to Engineering Field

Activity Northwest at the address provided on the notification form, faxed to 1-360-396-0857, or e-mailed to EFPB-AdakExcaNot@navy.mil. People on Adak may also call the 1-866-239-1219 phone number, if they have emergent needs.

At some sites, such as former landfills, or where the remedy in place is a protective cover, excavation by non-Navy personnel is absolutely prohibited. Absolute excavation prohibitions are not applicable to any of the 10 sites addressed by this DD. Excavation for the purpose of digging a domestic use well in the downtown area is also prohibited. Excavation prohibitions have been implemented through the Interim Conveyance document and the Final Institutional Control Management Plan (U.S. Navy 2004).

Table 2-1
Site Release History

Site	Suspected or Known Sources			Documented Releases
	USTs	ASTs	Other	
GCI Compound	1	0	Main road pipeline and former avgas pipeline	During UST removal, 2,000 gallons of water and petroleum released into excavation
SA 80	2	0	Main road pipeline	Fill hose ruptured while servicing two USTs at site, approximately 50 to 70 gallons of petroleum released, trace amounts of fuel dripped from ends of Main Road Pipeline section temporarily removed during one UST removal
Tanker Shed	1	0	Oil/water separator, vehicle wash rack	No releases documented
SA 78	2	2	None	Soil contamination and/or fuel leaking from piping connected to two ASTs and one UST observed during tank removals
SA 82	2	1	None	No releases documented
SA 88	1	0	None	No releases documented
SWMU 58/SA 73	6	1	Oil/water separator	JP-5 spilled from AST Jan-89
Yakutat Hangar	1	1	None	No releases documented
NORPAC Hill	0	2[a]	Underground fuel pipelines	No releases documented

[a]ASTs associated with fuel distribution system for the housing area.

Notes:
AST - aboveground storage tank
JP - jet petroleum
SA - source area
SWMU - solid waste management unit
UST - underground storage tank

Table 2-2
Summary of Impacted Media

Site	Soil	Groundwater	Sediment	Surface Water
GCI Compound	●	●		
SA 80	●	●		
Tanker Shed	●	●		
SA 78	●	●	●[a,b]	
SA 82	●			
SA 88	●			
SWMU 58/SA 73	●	●	●[a]	●
Yakutat Hangar	●			
NORPAC Hill	●		●[b]	

[a]Freshwater sediment
[b]Marine sediment

Table 2-3
Summary of Cleanup Activities

Site	Cleanup Activities						
	No. USTs Removed	No. ASTs Removed	Gallons of Free Product Removed	Cubic Yards of Soil Removed	No. of Wells Monitored Annually	Natural Attenuation Monitoring	Other Cleanup Activities
GCI Compound	1	NA	~5	220	2	Y	~90% of water and petroleum released to excavation recovered
SA 80	2	NA	~25	290	2	Y	Piping associated with UST 27089 removed, 450 gallons of water and product removed from UST 27089 excavation
Tanker Shed	1	NA	~530	~55	2	Y	None reported
SA 78	1[a]	2	0	0	2	Y	None reported
SA 82	2	1	< 1	Unknown	1	Y	During AST removal petroleum-impacted soils above 7 feet bgs were removed
SA 88	1	NA	~26	0	1	Y	None reported
SWMU 58/SA 73	6	1	~5	0	3	Y	Oil/water separator removed, french drain installed in drainage ditches and ditches backfilled to grade
Yakutat Hangar	1	1	~690	~500	2	Y	Petroleum product interceptor trench installed for free product removal, french drain installed in drainage ditch and ditch backfilled to grade
NORPAC Hill	NA	0	~1	0	0	N[b]	The 2 ASTs associated with the fuel distribution system for the housing area drained and pipelines associated with 2 ASTs drained and purged

Table 2-3 (Continued)
Summary of Cleanup Activities

[a]The removal of the second UST located at this site could not be confirmed. However, the second UST was not found during on-site activities.
[b]Monitored natural attenuation parameters monitored once at this site.

Notes:
AST - aboveground storage tank
bgs - below ground surface
JP - jet petroleum
NA - not applicable
SA - source area
SWMU - solid waste management unit
UST - underground storage tank

Table 2-4
Land and Groundwater Use Summary

Site	Current Landowner	Land Use			Potential Future Groundwater Use As Drinking Water	
		Historical	Current	Future	Yes	No
GCI Compound	TAC	Gasoline station/motor pool	Telecommunications facility	Commercial reuse (telecommunications facility)	•	
SA 80	TAC	Steam plant (1940s-1995)	Not used	Aviation reuse	•	
Tanker Shed	Alaska DOT	Aviation-related facility (air transport depot, base operations office, and maintenance facility for tanker trucks)	Not used	Aviation reuse	•	
SA 78	TAC	Fire station/transportation garage (1950-1991), office space/storage (1992-1995), vehicle refueling (1960s-1993)	Not used	Commercial reuse		•
SA 82	TAC	Building P-80-NSGA community center and automated data processing and training center, Building P-81-function unknown	Not used	Commercial reuse		•
SA 88	TAC	Auxiliary power generator/storage facility	Not used	Commercial reuse		•
SWMU 58/ SA 73	TAC	Heating/power plant for the NSGA complex (1950s–1995)	Not used	Commercial reuse		•
Yakutat Hangar	TAC	Airplane hangar/automotive hobby garage	Automotive hobby garage	Aviation reuse		•

Table 2-4 (Continued)
Land and Groundwater Use Summary

Site	Current Landowner	Land Use			Potential Future Groundwater Use As Drinking Water	
		Historical	Current	Future	Yes	No
NORPAC Hill	TAC	Army barracks, mess halls, Kuluk housing (constructed in 1960s)	Kuluk housing	Residential reuse (Kuluk housing), public facilities reuse (remainder of site)		•

Notes:
DOT - Department of Transportation
NSGA - Naval Security Group Activity
SA - source area
SWMU - solid waste management unit
TAC - The Aleut Corporation

3.0 IDENTIFICATION OF CONTAMINANTS OF POTENTIAL CONCERN

Petroleum hydrocarbons, polychlorinated biphenyls (PCBs), volatile organics, and metals have been detected in soil, groundwater, surface water, and sediment at the 10 free-product petroleum sites that pose no risk to human health or the environment above target health goals. The concentrations of contaminants in these media at each site were compared to Alaska DEC cleanup criteria and/or human health and ecological risk-based screening criteria to identify the contaminants of potential concern. The contaminants of potential concern in soil, groundwater, and surface water and sediment are presented below.

3.1 SOIL

The contaminants of potential concern in soil at the 10 free-product petroleum sites are shown on Table 3-1. A chemical was identified as a contaminant of potential concern if its concentration exceeded the Alaska Method Two cleanup levels established to prevent migration of contaminants from soil to groundwater in the over 40 inches of rainfall zone (18 AAC 75.341, Tables B1 and B2) and/or it was identified as a chemical of potential concern in the human health or ecological risk assessments. The following is a listing of the contaminants of potential concern identified at the 10 sites:

- 2-Methylnaphthalene
- Arsenic
- Benzene
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Cadmium
- Diesel-range organics (DRO)
- Ethylbenzene
- Gasoline-range organics (GRO)
- Lead
- Naphthalene
- PCB Aroclor 1260
- Residual-range organics (RRO)
- Toluene

- Xylenes

Only DRO is a contaminant of potential concern at all 10 sites, the remaining chemicals are contaminants of potential concern at a subset of the 10 sites.

3.2 GROUNDWATER

The contaminants of potential concern in groundwater at the 10 free-product petroleum sites are shown on Table 3-2. A chemical was identified as a contaminant of potential concern if its concentration exceeded the Alaska DEC groundwater cleanup levels and/or it was identified as a chemical of potential concern in the human health risk assessment. The Alaska DEC groundwater cleanup levels for groundwater used as a drinking water source [18 AAC 75.345(b)(1)] were used for three sites: GCI Compound, SA 80, and Tanker Shed. Ten times the Alaska DEC groundwater cleanup levels [18 AAC 75.345(b)(2)] were used for the remaining sites because groundwater is not reasonably expected to be a potential future source of drinking water at those sites. The following is a listing of the contaminants of concern identified at the 10 sites:

- 1,2,4-Trimethylbenzene
- 1,3,5-Trimethylbenzene
- 2-Methylnaphthalene
- Benzene
- Benzo(a)anthracene
- Benzo(a)pyrene
- Dibenz(a,h)anthracene
- DRO
- Ethylbenzene
- GRO
- Methylene chloride
- Naphthalene
- Toluene
- Xylenes

2-Methylnaphthalene, DRO, and naphthalene are contaminants of potential concern at all 10 sites, and the remaining chemicals are contaminants of potential concern at a subset of the 10 sites.

3.3 SURFACE WATER AND SEDIMENT

Contaminants of potential concern in surface water and sediment were only identified at two of the 10 free-product petroleum sites (see Table 3-3). A chemical was identified as a contaminant of potential concern if it was identified as a chemical of potential concern in either the human health and/or the ecological risk assessment. Although petroleum hydrocarbons were detected in freshwater and marine sediment samples downgradient from SA 78, both the ecological and human health risk assessments concluded that the exposure pathways were incomplete or insignificant. Therefore, chemicals of potential concern were only identified for SWMU 58/SA 73 and NORPAC Hill. The following is a listing of the contaminants of concern in surface water:

- DRO
- GRO

The following is a listing of the contaminants of potential concern in freshwater and marine sediment:

- DRO
- GRO
- Xylenes

Table 3-1
Contaminants of Potential Concern in Soil at the 10 Free-Product Petroleum Sites With No Unacceptable Risks

Site	Criteria for Inclusion	Contaminants of Potential Concern															
		2-Methylnaphthalene	Arsenic	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Cadmium	DRO	Ethylbenzene	GRO	Lead	Naphthalene	PCB Aroclor 1260	RRO	Toluene	Xylenes
GCI Compound	ADEC Criteria		●	●					●	●	●						
	Human Health COPC								●								
	Ecological COPC											●					
SA 80	ADEC Criteria								●								
	Human Health COPC								●								
Tanker Shed	ADEC Criteria			●					●		●					●	●
	Human Health COPC			●					●	●	●						
SA 78	ADEC Criteria		●	●				●	●	●	●	●				●	●
	Human Health COPC								●		●						●
SA 82	ADEC Criteria								●								
	Human Health COPC	●							●								
SA 88	ADEC Criteria								●								
	Human Health COPC								●								

Table 3-1 (Continued)
Contaminants of Potential Concern in Soil at the 10 Free-Product Petroleum Sites With No Unacceptable Risks

Site	Criteria for Inclusion	Contaminants of Potential Concern															
		2-Methylnaphthalene	Arsenic	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Cadmium	DRO	Ethylbenzene	GRO	Lead	Naphthalene	PCB Aroclor 1260	RRO	Toluene	Xylenes
SWMU 58/SA 73	ADEC Criteria			●		●			●	●	●		●				
	Human Health COPC				●	●	●		●		●		●		●		
Yakutat Hangar	ADEC Criteria								●	●							
	Human Health COPC								●					●			
NORPAC Hill	ADEC Criteria			●					●		●						●
	Human Health COPC								●								
	Ecological COPC								●						●	●	●

Notes:
ADEC - Alaska Department of Environmental Conservation
COPC - contaminant of potential concern
DRO - diesel-range organics
GRO - gasoline-range organics
PCB - polychlorinated biphenyl
RRO - residual-range organics

Table 3-2
Contaminants of Potential Concern in Groundwater at the 10 Free-Product Petroleum Sites with No Unacceptable Risks

Site	Criteria for Inclusion	Contaminants of Potential Concern													
		1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Methylnaphthalene	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Dibenz(a,h)anthracene	DRO	Ethylbenzene	GRO	Methylene chloride	Naphthalene	Toluene	Xylenes
GCI Compound	ADEC Criteria				●				●		●				
	Human Health COPC			●					●	●	●		●	●	●
SA 80	ADEC Criteria				●				●						
	Human Health COPC			●	●	●	●	●	●	●	●		●		●
Tanker Shed	ADEC Criteria				●				●		●				
	Human Health COPC	●	●	●	●				●	●	●		●	●	●
SA 78	ADEC Criteria				●						●	●			
	Human Health COPC			●	●				●	●	●		●	●	●
SA 82	Human Health COPC			●					●	●			●		
SA 88	Human Health COPC			●					●	●			●		
SWMU 58/SA 73	ADEC Criteria								●						
	Human Health COPC			●	●				●	●	●		●		●

Table 3-2 (Continued)
Contaminants of Potential Concern in Groundwater at the 10 Free-Product Petroleum Sites with No Unacceptable Risks

Site	Criteria for Inclusion	Contaminants of Potential Concern													
		1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Methylnaphthalene	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Dibenz(a,h)anthracene	DRO	Ethylbenzene	GRO	Methylene chloride	Naphthalene	Toluene	Xylenes
Yakutat Hangar	Human Health COPC			•	•				•	•			•		
NORPAC Hill	Human Health COPC			•					•				•		

Notes:
ADEC - Alaska Department of Environmental Conservation
COPC - contaminant of potential concern
DRO - diesel-range organics
GRO - gasoline-range organics

Table 3-3
Contaminants of Potential Concern in Surface Water and Sediment

Site	Media	Criteria for Inclusion	Contaminants of Potential Concern		
			DRO	GRO	Xylenes
SWMU 58/SA 73	Surface Water	Ecological COPC	●	●	
	Freshwater Sediment	Ecological COPC	●	●	●
NORPAC Hill	Marine Sediment	Ecological COPC	●		

Note:
Petroleum hydrocarbons were detected in freshwater and marine sediments at SA 78. However, the ecological risk assessment determined that concentrations of petroleum hydrocarbons were not high enough to identify any as contaminants of potential concern.
COPC - contaminant of potential concern
DRO - diesel-range organics
GRO - gasoline-range organics