USACE FUDS
DECISION DOCUMENT

AKUTAN NAVAL STATION
AKUTAN, ALASKA
(FUDS Property No. F10AK0018)

FINAL
AUGUST 2006

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AKUTAN NAVAL STATION
AKUTAN, ALASKA

DECISION DOCUMENT
AUGUST 2006

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ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
AST	aboveground storage tank
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	contaminant of concern
COPC	contaminant of potential concern
CSM	conceptual site model
DD	Decision Document
DERP	Defense Environmental Restoration Program
DoD	U.S. Department of Defense
DRO	diesel-range organics
EPA	U.S. Environmental Protection Agency
FFS	Focused Feasibility Study
FUDS	Formerly Used Defense Sites
IRA	interim removal action
mg/kg	milligrams per kilogram
NCP	National Oil and Hazardous Substances Contingency Plan
NOAA	National Oceanic and Atmospheric Administration
NS	Naval Station
O&M	operations and maintenance
PAH	polynuclear aromatic hydrocarbon
POL	petroleum, oil, and lubricants
PPE	personal protective equipment
RAO	remedial action objective
RecKey	record key
RfD	reference dose
RI	remedial investigation
RRO	residual-range organics

USACE	U.S. Army Corps of Engineers
USAED	U.S. Army Engineer District, Alaska
WWII	World War Two

PART 1: THE DECLARATION

1.1 SITE NAME AND LOCATION

The former Akutan Naval Station (NS) site is located on Akutan Island, one of the first islands in the eastern Aleutian Chain (Figure 1). Since 1996, the U.S. Army Engineer District, Alaska (USAED), has conducted environmental restoration activities at the former NS under the Defense Environmental Restoration Program (DERP) for Formerly Used Defense Sites (FUDS).

Originally a whaling station, the site was converted to a NS during World War Two (WWII). The former Akutan NS is located across Akutan Harbor, approximately 1.5 miles southwest of the City of Akutan, in the southern half of Township 70 South, Range 112 West, Seward Meridian. The site encompasses approximately 9 acres and is situated on a benched area located adjacent to the harbor. The coordinates for the site are 54 degrees 13 minutes north by 165 degrees 77 minutes west, Seward Meridian.

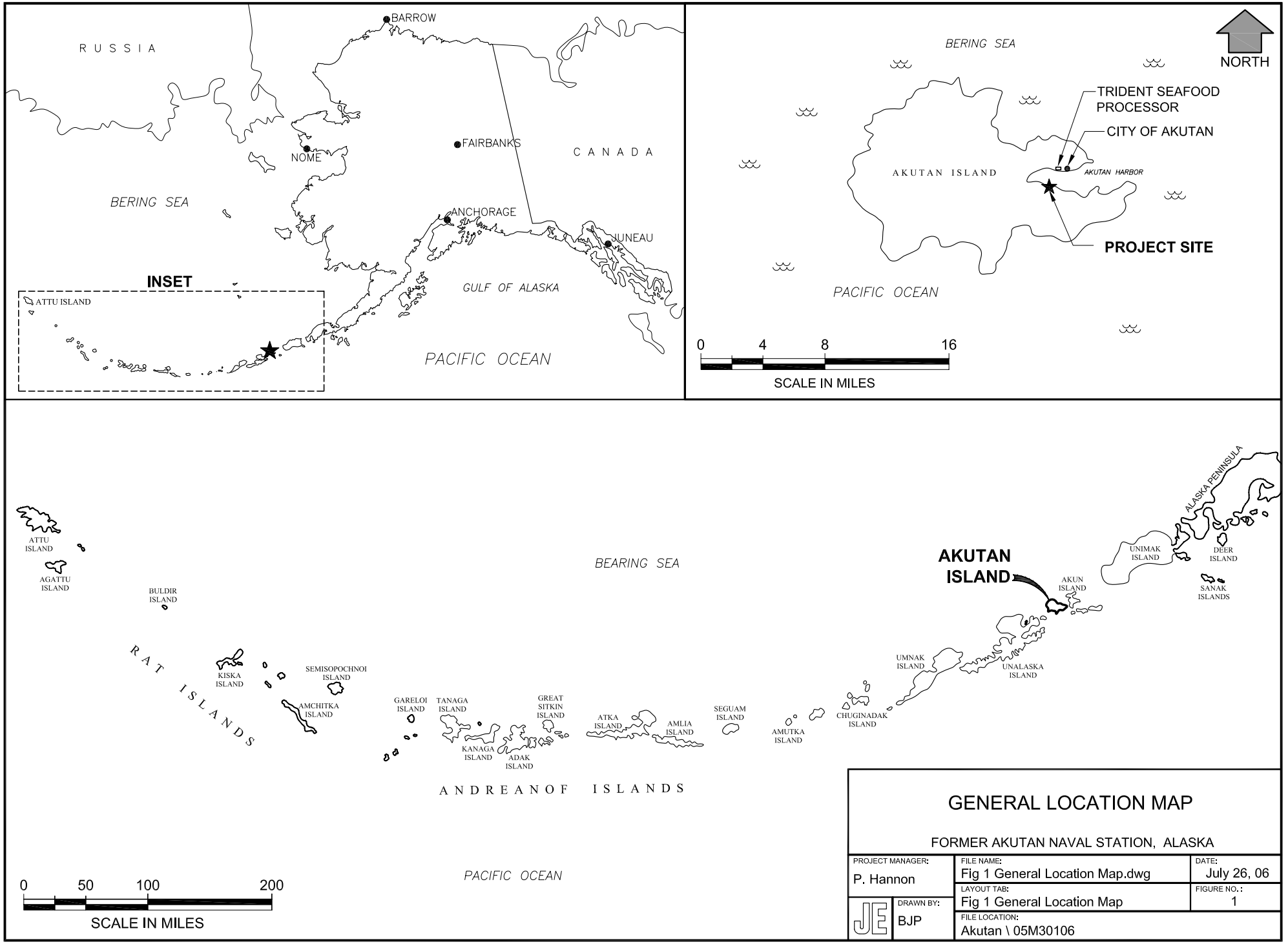
The former Akutan NS is listed under FUDS property number F10AK0018 and Alaska Department of Environmental Conservation (ADEC) record key (RecKey) number 1996X132401.

The former Akutan NS is not listed on the National Priorities List.

1.2 STATEMENT OF BASIS AND PURPOSE

Authorities: DERP, United States Code, Title 10, Section 2701, et seq.; Alaska Administrative Code (AAC), Title 18, Chapter 75.

G:\Autocad\AKUTAN\05M30106\Fig 1 General Location Map.dwg Jul 31,2006 -bperatro)



GENERAL LOCATION MAP

FORMER AKUTAN NAVAL STATION, ALASKA

PROJECT MANAGER: P. Hannon	FILE NAME: Fig 1 General Location Map.dwg	DATE: July 26, 06
	LAYOUT TAB: Fig 1 General Location Map	FIGURE NO.: 1
JE DRAWN BY: BJP	FILE LOCATION: Akutan \ 05M30106	

This Decision Document (DD) presents the U.S. Army Corps of Engineers (USACE)-selected remedy for the former Akutan NS, chosen in accordance with DERP, the Administrative Record for this site, and based upon the successful results of interim removal actions (IRA) and treatment of excavated soil. Petroleum, oil and lubricants (POL)-contaminated sites fall under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) petroleum exclusion and are being addressed under the authority of the DERP statute. The proposed response actions meet ADEC requirements for cleanup of petroleum-contaminated sites and are consistent with the response process set forth in the National Oil and Hazardous Substances Contingency Plan (NCP).

1.3 ASSESSMENT OF THE SITE

The response action selected in this DD is necessary to protect the public health or welfare or the environment from environmental damage caused by the release of petroleum-related contaminants that present an imminent and substantial endangerment to public health or welfare in the environment.

A summary of site cleanup work and investigations at the site is as follows:

- Cleaning and demolition of six aboveground storage tanks (ASTs)
- Excavation and removal of 6,000 tons of petroleum-contaminated soil, with transport to Dutch Harbor for thermal treatment at another Total Environmental Restoration Contract project site
- Construction, operation, and maintenance of a passive biovent system for further soil treatment
- Groundwater monitoring program
- Remedial investigation and risk assessment to support site closure
- Site restoration and final reporting

During the investigations, removal actions, and bioventing system operation, the primary sources of POL contamination were removed, and the majority of the site's soil and sediment was cleaned up to within regulatory limits.

1.4 DESCRIPTION OF SELECTED REMEDY

Areas at the former Akutan NS containing POL levels above regulatory limits are as follows:

- Inland Soil: The selected remedy for POL remaining in inland soil is Alternative 3 (Limited Cover and Informational Institutional Controls). This remedy includes covering the remaining "hot spots" with a semipermeable geotextile, then constructing a cover of clean fill over the fabric. The construction in combination with implementation of informational institutional controls in the form of a deed notice will mitigate the opportunity for human contact with the remaining subsurface contamination. A monitoring program will ensure that the cover remains intact and that unacceptable risks and exposure pathways are avoided.
- Marine Sediments: The selected remedy for elevated POL levels in marine sediments is Alternative 2 (Limited Monitoring and Reserved-Use Designation). This remedy is a limited monitoring program in conjunction with classifying the intertidal zone under reserved-use designation. The area will be managed under Alaska Department of Natural Resources (ADNR) jurisdiction. The limited monitoring program includes conducting visual inspections of the marine sediments and surface water up to four times annually over a 5-year period. At the end of 5 years, a review of the site status and inspection data will be conducted to determine if continued monitoring is necessary.

Both alternatives document that inland soil and marine sediment contamination remain at the site. Informational institutional controls (deed notice) for inland soil assure that any potential new landowner is advised of the remaining inland soil contamination. In addition, any contaminated media unearthed must be managed by the current or future landowner in accordance with existing laws and regulations. USACE will facilitate the filing of the deed notice with the Aleutian Islands Recording District of ADNR in Anchorage as part of a permanent public record associated with the parcel. Copies of the notice will be distributed to all stakeholders.

The reserved-use designation informational institutional control for intertidal and subtidal zone sediment will be filed and distributed by ADNR Division of Mining, Land and Water at the request of USACE and become a permanent part of the public lands record associated with the site. Reserved use designation assures ADNR the ability to control access to, and regulate any construction or intrusive activity in the contaminated sediments.

Groundwater does not warrant remedial action based on results of the groundwater monitoring program; therefore, remedial alternatives were not developed for groundwater. USACE recommends no further action for groundwater.

1.5 STATUTORY DETERMINATIONS

The selected remedies are protective of human health and the environment, comply with federal and state requirements that are readily applicable or relevant and appropriate, are cost effective, and utilize permanent solutions to the maximum extent practicable. The prior treatment of the POL-contaminated soil satisfies the statutory preference for treatment as a principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment). After a 5 year monitoring period, a review of the data will be conducted to determine if further monitoring is required.

1.6 DATA CERTIFICATION CHECKLIST

The following information is included in Part 2 of this DD, The Decision Summary. Additional information can be found in the Administrative Record file for this site.

- Identification of contaminants of concern (COC) and their respective concentrations (Section 2.15.1, Summary of Human Health Risk Evaluation)
- Baseline risk and summary of site risks (Section 2.17, Summary of Site Risks)
- Cleanup levels established and basis for the levels (Section 2.16, Remedial Action Objective)
- How contaminated source materials are addressed (Section 2.12, Types of Contamination and the Affected Media, and Section 2.22, Selected Remedy)
- Current and reasonably anticipated future land-use assumptions and current and potential beneficial uses of groundwater used in the baseline risk evaluation and DD (Section 2.14, Current and Potential Land and Water Uses)
- Potential use of the site as a result of the selected remedy (Section 2.22.4, Expected Outcomes of the Selected Remedy)
- Estimated capital, annual operations and maintenance (O&M), and total present-worth costs (Section 2.22.3, Summary of the Estimated Remedy Costs)

- Key factors that led to selecting the remedy (Section 2.20, Comparative Analysis of Alternatives)

AUTHORIZING SIGNATURES

This DD presents the selected remedy at the former Akutan NS, Akutan, Alaska. USACE is the lead agency under DERP at the Akutan NS FUDS and has developed this DD consistent with DERP. This DD will be incorporated into the larger Administrative Record file for the former Akutan NS. The AR is available for public view at the ARLIS Library, located in the Consortium Library at the University of Alaska, Anchorage; the Akutan Public Library in Akutan, Alaska; and the Alaska District Corps of Engineers Office on Elmendorf AFB, Alaska. This document, presenting a selected remedy with a present-worth cost estimate between $800K and $900K is approved by the undersigned, pursuant to Memorandum DAIM-ZA, 9 September 2003, Subject: Policies for Staffing and Approving Decision Documents, and to Engineer Regulation 200-3-1, FUDS Program Policy.

APPROVED:

Kevin J. Wilson
Colonel, Corps of Engineers
District Commander

24 Aug 06
Date

This signature sheet documents the decision made for the former Akutan NS, Akutan, Alaska. ADEC concurs with USACE's selected remedy. The decision may be reviewed and modified in the future if new information becomes available that indicates the presence of contamination or exposures that may cause unacceptable risk to human health or the environment.

Jennifer Roberts
Federal Facilities Environmental Restoration Program Manager
Alaska Department of Environmental Conservation

Sept 20 2006
Date

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PART 2: THE DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND BRIEF DESCRIPTION

The former Akutan NS is located in the southern half of Township 70 South, Range 112 West, Seward Meridian, on Akutan Island, approximately 1.5 miles southwest of the city of Akutan, across Akutan Harbor (Figure 1). Akutan Island is located west of the Alaska Peninsula and is part of the Aleutian Islands. The majority of the approximately 9-acre site is situated on a bench between a cobble beach at sea level and a steep north-facing slope (Figure 2).

The FUDS identification number for this site is F10AK0018. The ADEC Contaminated Sites RecKey number is 199625X132401.

The lead agency for this site is USACE, and the support agency is ADEC.

The investigation and environmental restoration activities at the former Akutan NS were conducted under the U.S. Department of Defense (DoD) FUDS program. DoD will pay for all regulatory oversight, as part of the Defense and State Memorandum of Agreement, and cleanup costs will originate from the Defense Environmental Restoration Account.

2.2 SITE HISTORY

The former Akutan NS functioned as a whale processing facility from 1912 through 1939. During WWII, the site was used as a fueling, supply, and repair facility for Russian ships operating between the United States and Russian ports and as an emergency landing site for seaplanes from 1942 until 1944. From 1945 until 2004, the site was used by local fisherman to store nets, crab pots, and other fishing equipment. The site is currently owned by Trident Seafoods and is used to store miscellaneous fisheries-related equipment.

During the U.S. Navy's occupation, the Native Alaskan residents of Akutan were relocated with other Aleuts to Ketchikan, Alaska. The Aleuts returned to Akutan in 1944, after the

Navy abandoned the island. Akutan residents are now involved primarily with commercial fishing. Trident Seafoods currently operates a fish processing facility approximately 0.5 miles west of the city of Akutan and employs between 600 to 1,000 seasonal workers. Additionally, floating seafood processors use Akutan Harbor and the services offered by the city of Akutan.

The former Akutan NS lies on two adjacent parcels of private property: The western portion is owned by the Akutan Corporation, and the larger eastern parcel is owned by Trident Seafoods Corporation. The former Akutan NS site has been used to store fisheries-related equipment since WWII and will likely be used for a similar purpose in the future. The presence of fuel-related constituents in the area is a result of historic whaling operations and World War II-era military use of the site.

2.3 SUMMARY OF ACTIONS TO DATE

Between 1992 and 2001, the following site investigation and remedial action activities were conducted at the former Akutan NS site:

- 1992 – site visit
- 1996 to 1998 – remedial investigation (RI)
- 1996 – IRA
- 2000 to 2001 – marine sediment RI
- 2001 – focused feasibility study (FFS)
- 1996 to 2002 – groundwater monitoring program

These restoration efforts addressed contamination in soil, sediment, air, and groundwater and assessed potential impacts to human health and environmental receptors. Work under the DERP-FUDS program began in 1996, with final site restoration activities (with the exception of monitoring) scheduled for completion in 2006. Information on each effort is detailed in the following section.

NORTH

AKUTAN HARBOR

PILINGS/
OLD PIER

DOCK

MW-12

MW-13

MW-14

MW-5

MW-7

MW-9

MW-11

MW-8

WEST
BOILER

EAST
BOILER

MW-10

MW-6

ROADWAY

FORMER
TANK 1

FORMER
TANK 2

FORMER
TANK 3

FORMER
TANK 4

FORMER
TANK 5

FORMER
TANK 6

TOE OF SLOPE

ROADWAY

LEASE PARCEL
CREATED BY 90-22RS
AKUTAN CORP.

U.S. SURVEY NO.
1143 TRIDENT
SEAFOODS

GROUNDWATER
FLOW DIRECTION

LEGEND:

- FORMER MONITORING WELL LOCATION
- PROPERTY LINE
- SHORELINE
- CREEK
- CULVERT
- DITCH LINE
- DIRECTION OF SURFACE WATER DRAINAGE

NOTES:
- FORMER TANKS 1,2,3 & 5 WERE 5,700 BARREL CAPACITY, ABOVEGROUND STORAGE TANKS.
- FORMER TANK 4 WAS A 4,700 BARREL CAPACITY, ABOVEGROUND STORAGE TANK.

0 40 80 160

SCALE IN FEET

SITE LOCATION MAP

FORMER AKUTAN NAVAL STATION, ALASKA

PROJECT MANAGER: P. Hannon		FILE NAME: Fig 2 Site Location Map.dwg	DATE: July 31, 06
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		FILE LOCATION: Akutan \ 05M30106	

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2.4 INVESTIGATION AND REMEDIAL ACTION HISTORY

USACE conducted investigation and restoration activities at the former Akutan NS between 1992 and 2001. The objective of these activities was to identify the extent of POL and other contaminants at the site and implement remedial actions protective of human health and the environment.

2.4.1 1992 Site Visit

During 1992, USACE conducted a preliminary visit to the former Akutan NS to observe conditions at the site and to collect soil, oil, and water samples for analysis and site characterization. The visit assisted in identifying contaminants of potential concern (COPC) at the site, assessing the associated potential risks to human health and the environment, and planning future remedial actions.

2.4.2 1996 to 1998 Remedial Investigation

Various RIs at the site began in 1996 and were conducted concurrently with, and subsequent to, the IRA. The IRA was conducted between 28 June and 25 November 1996.

The RI began with two visits to the site in 1996 that were conducted to evaluate potential sources of contamination and potential migration pathways and to further assess potential affects on human and ecological receptors. Other objectives accomplished during these visits were the documentation of site ecological habitats and wetlands, development of site maps, evaluation of cultural resources, and initiation of a community relations program. The scoping visits provided the necessary information to develop planning documents for the IRA and further RI work at the site. The RI and IRA conducted in 1996 were an integrated effort that provided project flexibility and allowed for an efficient and expedited site restoration effort.

The objective of the RI work was to define the horizontal and vertical extent of the POL contamination at the site, characterize remaining POL concentrations after removal actions, and provide data for comparison of background soil, sediment surface, and groundwater with

similar onsite media in the event buildings are constructed in the future. The RI effort included test pitting and monitoring well installation and development. During these efforts, the subsurface conditions were logged, and soil and groundwater samples were collected. Data from these investigations were used to characterize POL type, concentration, and extent; contaminant transport potential; associated degradation processes; and contaminant toxicity to potential receptors. Over 200 samples of various media were collected for analysis during RI efforts. Results of the investigation showed concentrations of diesel-range organics (DRO) ranging from nondetect to 31,800 milligrams per kilogram (mg/kg) and residual-range organics (RRO) concentrations ranging from nondetect to 36,600 mg/kg.

In an effort to promote biodegradation of the remaining POL in the subsurface site soil, a passive bioventing system was installed in the Central Bench Area after completion of the 1996 IRA. After installation, the trenches were backfilled with crushed rock and clean soil, and the surface soil was reseeded and fertilized.

To investigate groundwater conditions, 10 monitoring wells were installed in 1996, and 4 additional wells were installed in 1998. Four of the original 10 wells were decommissioned in 1996, and the remaining 10 wells were sampled at least semiannually between 1996 and 2001 to evaluate the potential contribution of contaminants in groundwater to the adjacent marine and shoreline sediments, to observe POL trends, and to evaluate bioventing system performance. The well installation and sampling program also gathered basic information on hydrogeologic conditions, including groundwater depth, flow direction, and gradient. Groundwater monitoring program provided a record of contaminant trends over time that assisted with risk-management decisions, recommendations, and decisions for further action at the site. Based on a review of the groundwater sampling data collected between 1996 and 2001, POL concentrations have, with some fluctuation, decreased over time. This trend indicates that POL source removal and the biovent system have been effective in restoring groundwater quality. The remaining 10 monitoring wells and biovent system were decommissioned in 2002.

In 1997, additional soil samples were collected to further delineate POL contamination and evaluate trends in remaining concentrations. Localized areas of soil contamination identified during these investigations are shown on Figure 3.

In 1998, a soil vapor sampling program was completed to assess the potential impact of subsurface soil vapors on humans working indoors in the event buildings. Sampling results indicated no potential health risk based on soil vapors.

Beginning in August 2000 and continuing into 2001, a marine sediment RI/FFS was conducted for the former Akutan NS to determine if adjacent marine sediments were impacted by historic releases from the site. The primary goal of the 2000 RI was to further characterize the site to determine if additional remedial action was required for the marine environment prior to closure of the site. Chemical, biological, and toxicological data were collected during the RI to assess ecological risk to both the intertidal and subtidal marine environment from exposure to potentially contaminated groundwater seeps. POL contamination was identified in four localized areas of intertidal and subtidal sediments located to the east and west of the former NS dock. Sampling transects and POL concentrations are shown on Figure 4. With the exception of the four identified locations, the intertidal and subtidal area surveyed was found to be relatively healthy, and an intrusive remedial action would most likely cause more harm than allowing the affected areas to naturally attenuate.

The areas of intertidal and subtidal sediment contamination identified during the RI were further evaluated in the 2001 FFS, determining that the remaining POL within the marine sediments has not adversely affected the ecology of the near-shore marine environment and in general does not pose a risk to the environment. However, should future short-term use of the site cause disruption of the contaminated marine sediments, engineering and spill release controls may be required. The remaining contamination is anticipated to naturally attenuate over time.

Background soil, groundwater, and marine sediment samples collected during the 2000 RI were analyzed to determine the naturally occurring levels of total organic carbon and metals

for assessing risk to human health and the environment from FUDS activities. Data gathered during RI efforts was used for completion of a human health and ecological baseline risk assessment. This risk assessment, including fate and transport modeling, was performed to evaluate the risk from the remaining POL contamination to human health and the environment.

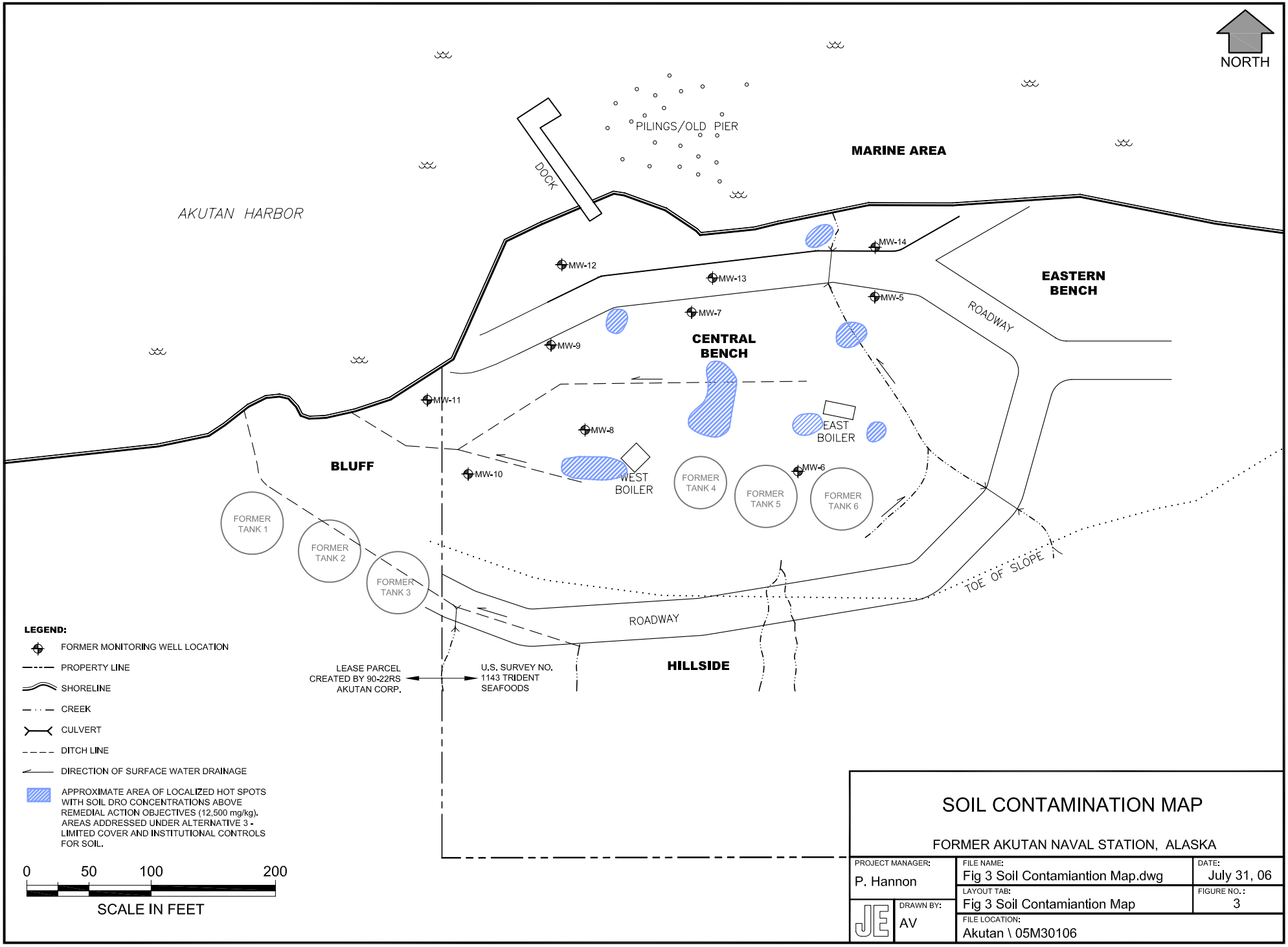
2.4.3 1996 Interim Removal Action

As discussed previously, RI and IRA processes were conducted concurrently at the former Akutan NS beginning in 1996. Based on 1992 and 1996 site visits, planning documents were developed, procurements were completed, and a field crew was mobilized to the site. The IRA was completed between 28 June and 25 November 1996.

The main objective of the 1996 IRA was to remove the primary and secondary sources of petroleum contamination at the site. The primary source was the ASTs containing fuel and tank sludge; the resulting secondary contamination was the spilled POL within the soil and groundwater at the site.

During the IRA, six ASTs were cleaned and removed from the site. The tanks included one 4,700-barrel AST used to store Number One Whale Oil and five 5,700-barrel ASTs used to store fuel oil and Bunker C Fuel (Fuel Oil No. 6).

More than 60,000 gallons of oil and sludge was removed from the tanks and barged to Anchorage for treatment and/or recycling. The six ASTs and appurtenant piping were removed for recycling by a scrap-steel contractor. During this removal action, approximately 4,000 cubic yards (approximately 6,000 tons) of POL-contaminated soil was excavated and transported to Dutch Harbor for thermal treatment.



SOIL CONTAMINATION MAP

FORMER AKUTAN NAVAL STATION, ALASKA

PROJECT MANAGER: P. Hannon	FILE NAME: Fig 3 Soil Contamiantion Map.dwg	DATE: July 31, 06
	LAYOUT TAB: Fig 3 Soil Contamiantion Map	FIGURE NO.: 3
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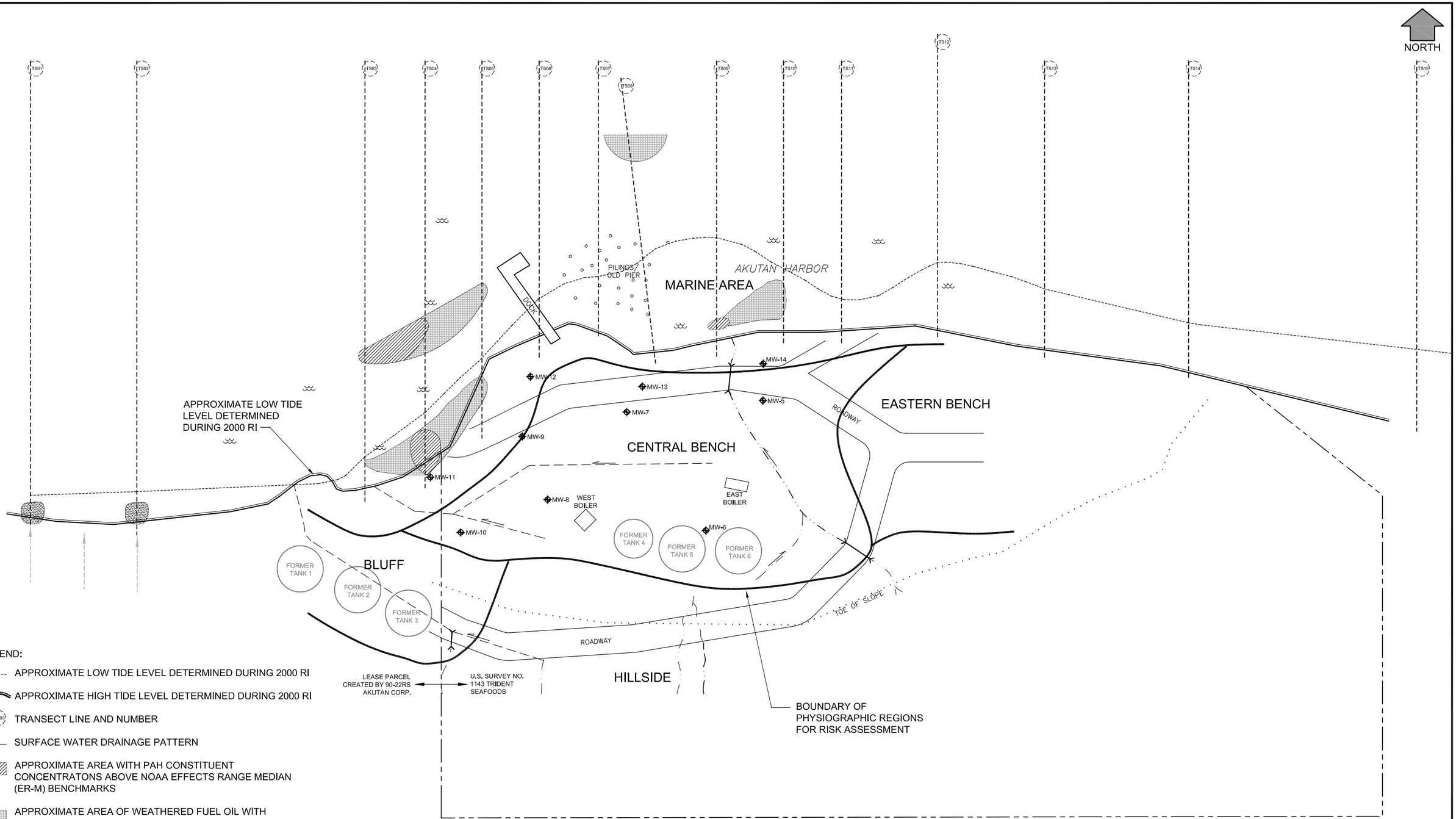

LEGEND:

- APPROXIMATE LOW TIDE LEVEL DETERMINED DURING 2000 RI
- APPROXIMATE HIGH TIDE LEVEL DETERMINED DURING 2000 RI
- TS03 TRANSECT LINE AND NUMBER
- SURFACE WATER DRAINAGE PATTERN
- APPROXIMATE AREA WITH PAH CONSTITUENT CONCENTRATONS ABOVE NOAA EFFECTS RANGE MEDIAN (ER-M) BENCHMARKS
- APPROXIMATE AREA OF WEATHERED FUEL OIL WITH UNDERLYING NON-DISTIGUISHABLE PAH CONTRIBUTION
- APPROXIMATE AREA OF WEATHERED FUEL OIL. HYDROCARBON PATTERN IS INCONSISTENT WITH THE PATTERN OBSERVED IN OTHER MARINE SEDIMENTS LOCATED ADJACENT TO THE FORMER NAVAL STATION

0 50 100 200

SCALE IN FEET

NOTES:

- FORMER TANKS 1,2,3 & 5 WERE 5,700 BARREL CAPACITY, ABOVEGROUND STORAGE TANKS.
- FORMER TANK 4 WAS A 4,700 BARREL CAPACITY, ABOVEGROUND STORAGE TANK.
- PAH = POLYNUCLEAR AROMATIC HYDROCARBONS

SEDIMENT CONTAMINATION MAP

FORMER AKUTAN NAVAL STATION, ALASKA

PROJECT MANAGER: P. Hannon		FILE NAME: Fig 4 Sediment Contamination.dwg	DATE: July 31, 06
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		FILE LOCATION: Akutan \ 05M30106	

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The POL-contaminated soil was excavated to an approximate depth of 3 to 4 feet below ground surface (bgs), removing the most highly contaminated soil. Field observations and analytical results indicated that the POL-contaminated soil may extend to an approximate depth of 10 feet bgs. All contaminated soil was not excavated due to a shallow water table and bedrock in the area that limited excavation depths to approximately 4 feet bgs.

After soil excavation was complete, a passive biovent system was installed within the residual petroleum-contaminated subsurface soil to enhance natural biodegradation of remaining POL contaminants. After installation of this system, the excavated area was covered with clean soil, graded, fertilized, and reseeded. An erosion control system was installed to divert runoff from the excavation area.

During the RI/IRA, no attempt was made to excavate contaminated soil in the intertidal and subtidal areas, to minimize the impact on sensitive flora and fauna within the area.

2.5 ENFORCEMENT HISTORY

The RI and IRA at the former Akutan NS were carried out under the DERP FUDS program. There have been no enforcement activities, notices of violation, or lawsuits pertaining to DoD activities at the former Akutan NS.

2.6 COMMUNITY PARTICIPATION

Community involvement has been key to the success of this site restoration project. Public meetings have been held in the city of Akutan, beginning with the RI/IRA in 1996 and thereafter throughout the duration of the project. These public meetings solicited input from the community on the project, provided updated project information, and solicited local hire. Public meetings have typically included representatives from the city of Akutan, the Akutan Native Corporation, the Tribal Council, other community members, and the landowners.

USACE and ADEC provided information regarding the cleanup of the former Akutan NS to the public through the Administrative Record file for the site and announcements published in

the local newspaper, the *Dutch Harbor Fisherman*. USACE and ADEC encouraged the public to gain a comprehensive understanding of the FUDS activities conducted at the site and to be involved in investigation and restoration activities.

The Responsiveness Summary included in this DD addresses public comment on the Proposed Plan and documents the final selected remedy for the site.

2.7 SCOPE AND ROLE OF RESPONSE ACTION

Areas at the former Akutan NS with remaining elevated POL concentrations are select locations of inland soil and marine sediments. The final response action, described below, is in addition to the RI/IRA and risk assessment work completed between 1996 and 2002.

This DD details the selected remedy chosen for the former Akutan NS site, described in the Proposed Plan distributed for public review and comment in April 2006. The selected remedy for the two areas of remaining contamination includes covering the select areas of inland soil with a semipermeable geofabric and 2 feet of clean fill and monitoring marine sediments in the tidal area and surface water quality. Both areas will have informational institutional controls invoked. For the inland soil, informational institutional controls will be in the form of a deed notice warning potential buyers of the remaining contamination and advising proper handling requirements in the event POL contamination is encountered. The areas of marine sediment contamination will be placed under reserved-use designation administered by ADNR. Informational institutional controls will be recorded with the Aleutian Islands Recording District of ADNR Division of Mining, Land and Water for the inland soil and ADNR for the intertidal area.

Through these actions, the remedial action objectives (RAO) of protecting public health and welfare and the environment from the remaining contamination will be met. The selected remedial action is planned for summer 2006.

2.8 SITE CHARACTERISTICS

2.8.1 Overview

The former Akutan NS site is located 35 miles east of Dutch Harbor and approximately 766 air miles southwest of Anchorage, accessible only by boat or float plane (Figure 1). The former Akutan NS is approximately 350 feet wide and 1,100 feet long, comprised of slightly less than 9 acres. The site is situated on one of two relatively flat areas along the south side of Akutan Harbor (Figure 2). Directly behind the site (south), mountains rise in elevation to approximately 1,700 feet.

The former Akutan NS was divided into five distinct geographic areas to facilitate discussion of remaining contamination and remedial planning purposes: Bluff Area, Central Bench Area, Eastern Bench Area, Marine Area, and Hillside Area (Figure 3). The Bluff Area, Eastern Bench Area, and Hillside Area have no remaining contaminants above target cleanup concentrations, require no additional response actions, and will not be discussed further in this document.

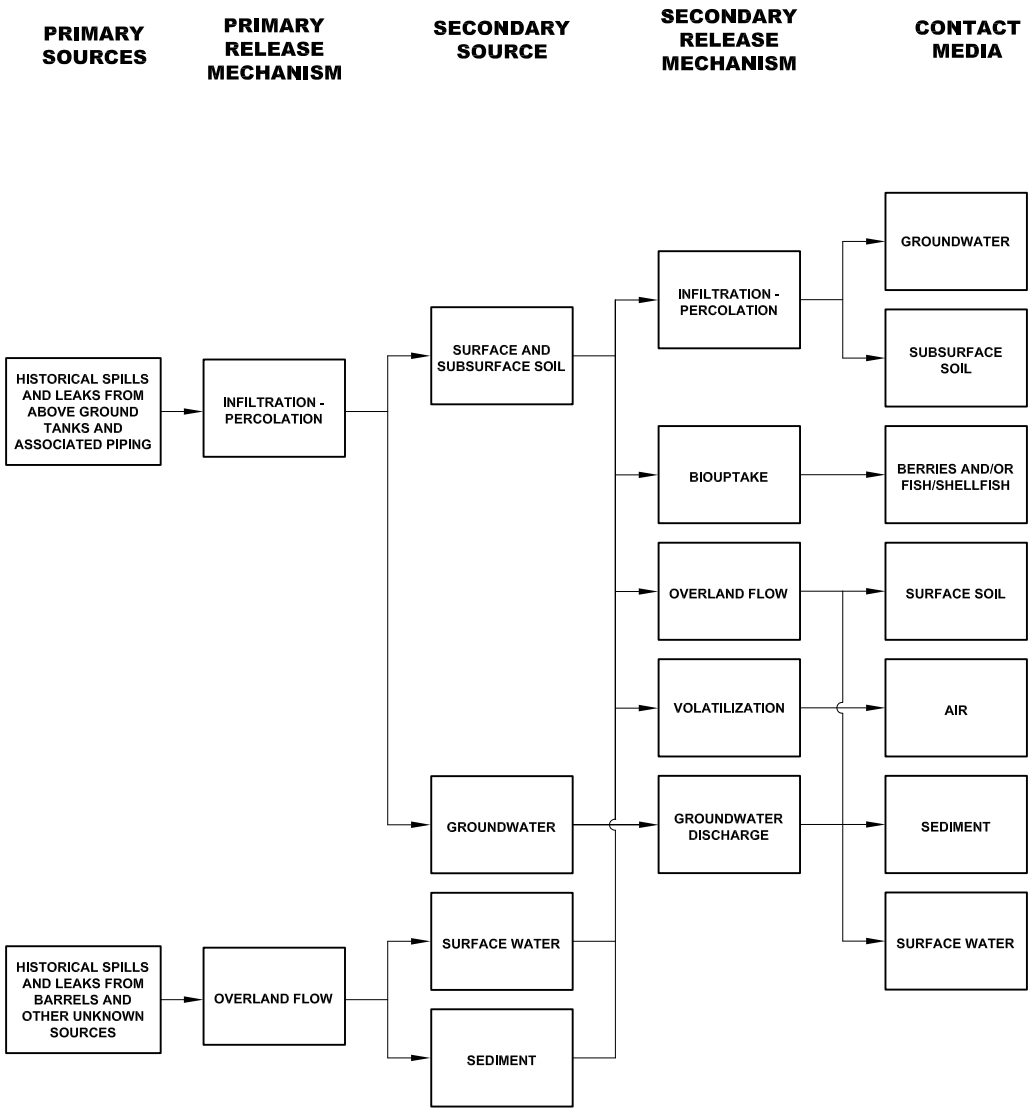
2.8.2 Conceptual Site Models, Human Health and Ecological Receptors

Figures 5 and 6 present conceptual site models (CSM) for the former Akutan NS. These graphical representations show potential sources, release mechanisms, transport media, exposure routes, and human and ecological receptors.

Conceptual Site Model for Human Health

The remaining sources of POL contamination at the site include areas of subsurface soil within the Central Bench Area and residual contamination in marine sediment. Potential release mechanisms for the remaining contaminants include:

- Leaching into groundwater from residual subsurface soil contaminants in the Central Bench Area
- Groundwater discharge into marine water
- Residual contamination in marine sediment releasing contaminants into marine water



POTENTIAL RECEPTORS

EXPOSURE ROUTE	HUMAN					ECOLOGICAL	
	CURRENT OR FUTURE RECREATIONAL VISITOR	CURRENT OR FUTURE OFFSITE RECEPTOR	FUTURE ONSITE WORKER	FUTURE RESIDENT	FUTURE EXCAVATION WORKER	AQUATIC	TERRESTRIAL
INHALATION (VOCs)	—	—	×	×	—	—	—
INGESTION	—	—	×	×	—	—	—
DERMAL	—	—	×	×	—	—	—
INHALATION (PARTICULATES)	—	—	—	—	—	—	—
INGESTION	—	—	×	×	×	—	—
DERMAL	—	—	×	×	×	—	—
INGESTION	×	×	—	×	—	×	×
INHALATION (PARTICULATES)	—	—	—	—	—	—	—
INGESTION	×	—	×	×	×	—	×
DERMAL	×	—	×	×	×	—	×
INHALATION (VOCs)	—	—	×	×	×	—	—
INHALATION	—	—	—	—	—	—	—
INGESTION	×	—	—	—	—	×	—
DERMAL	×	—	—	—	—	×	—
INHALATION	—	—	—	—	—	—	—
INGESTION	—	—	—	—	—	×	×
DERMAL	×	—	—	—	—	×	×

KEY:
× COMPLETED EXPOSURE PATHWAY.

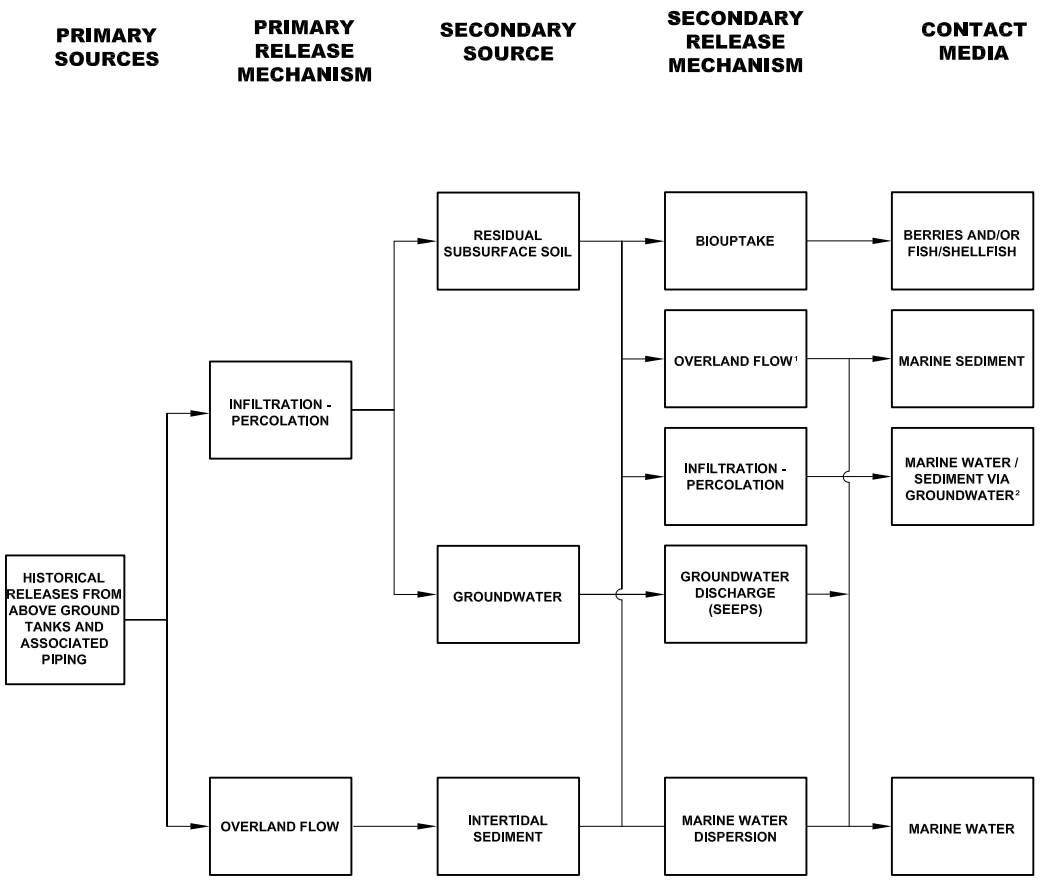
— PATHWAY NOT COMPLETE.

NOTES:
1. THE POSSIBILITY EXISTS THAT SUBSURFACE CONTAMINATION MAY BE BROUGHT TO THE SURFACE AS A RESULT OF FUTURE CONSTRUCTION OR EXCAVATION ACTIVITIES.
2. GROUNDWATGER IS THOUGHT TO DISCHARGE TO THE MARINE ENVIRONMENT ONLY (I.e., GROUNDWATER ONLY CONTACTS MARINE SEDIMENTS AND SURFACE WATER).
3. VAPOR SOURCES INCLUDE SOIL AND/OR GROUNDWATER CONTAMINATION. VAPOR MIGRATION FROM VOLATILE ORGANIC COMPOUNDS (VOCs) INTO A COMMERCIAL, INDUSTRIAL, OR RESIDENTIAL STRUCTURE IS CONSIDERED.

SOIL CONCEPTUAL SITE MODEL

FORMER AKUTAN NAVAL STATION, ALASKA

PROJECT MANAGER: P. HAannon	FILE NAME: Fig 5 & 6 CSMs.dwg	DATE: July 26, 06
DRAWN BY: AV	LAYOUT TAB: Soil CSM	FIGURE NO.: 5
	FILE LOCATION: Akutan \ 05M30106	



POTENTIAL RECEPTORS

EXPOSURE ROUTE	HUMAN					ECOLOGICAL	
	CURRENT OR FUTURE RECREATIONAL VISITOR	CURRENT OR FUTURE OFFSITE RECEPTOR	FUTURE ONSITE WORKER	FUTURE RESIDENT	FUTURE EXCAVATION WORKER	AQUATIC	TERRESTRIAL
INGESTION	×	×	—	×	—	×	×
INGESTION DERMAL	— —	— —	— —	— —	— —	× ×	× ×
INGESTION DERMAL	— —	— —	— —	— —	— —	× ×	— —
INGESTION DERMAL	— —	— —	— —	— —	— —	× ×	— —

KEY:
× COMPLETED EXPOSURE PATHWAY.

— PATHWAY NOT COMPLETE.

NOTES:
1. THE POSSIBILITY EXISTS THAT SUBSURFACE CONTAMINATION MAY BE BROUGHT TO THE SURFACE AS A RESULT OF FUTURE CONSTRUCTION OR EXCAVATION ACTIVITIES.
2. GROUNDWATER IS THOUGHT TO DISCHARGE TO THE MARINE ENVIRONMENT ONLY (I.e., GROUNDWATER ONLY CONTACTS MARINE SEDIMENTS AND SURFACE WATER).

SEDIMENT CONCEPTUAL SITE MODEL

FORMER AKUTAN NAVAL STATION, ALASKA

PROJECT MANAGER:	FILE NAME:	DATE:
P. HAannon	Fig 6 CSMs.dwg	July 26, 06
DRAWN BY:	LAYOUT TAB:	FIGURE NO.:
AV	Sediment CSM	6
JE	FILE LOCATION: Akutan \ 05M30106	

- Contaminated groundwater traveling overland and discharging to surface seeps or marine water and marine sediment
- Contaminants in marine sediment and marine water taken up and accumulated in marine organisms

One scenario based on future site activity could include the exposure of residual POL-contaminated subsurface soil from intrusive activities such as excavation or heavy equipment operation. Contaminants from exposed POL-containing soil could be transported by overland flow and released into the marine water and marine sediment. Transport media include marine water, marine sediment, and marine organisms.

Conceptual Site Model for Ecological Receptors

The risk screening conducted as part of the 2001 Marine Sediment RI (USAED 2001) concluded that potential risks from nearshore marine sediment to ecological receptors exists at discrete, limited locations within the intertidal and subtidal zones at the site that warrant further evaluation or action. Results of the biological assessment, including an evaluation of the presence and/or absence of petroleum-sensitive species, indicate only limited impacts (i.e., stressed biological communities) to biological resources, even within areas identified as containing contamination. On a sitewide basis, the ecological assessment did not identify any significant impacts to the epifauna or infauna from fuel- and polynuclear aromatic hydrocarbon (PAH)-contaminated sediments, based on species diversity and abundance.

Ecological receptors of concern include seabirds and shorebirds, as well as intertidal and subtidal marine biota. Because seabirds and shorebirds may consume intertidal or subtidal invertebrates in the vicinity of the site, they face the possibility of ingestion of contaminated food.

Of the species indigenous to the area, Steller's sea lion is listed by the U.S. Fish and Wildlife Service as being threatened or endangered. Commercially important species include all species of salmon, cod, and halibut.

2.9 SURFACE AND SUBSURFACE FEATURES

No known tanks, structures, or drums remain on the site from past military activities. During the 1996 IRA, six large ASTs and associated piping were removed, and approximately 4,000 cubic yards (or approximately 6,000 tons) of POL-contaminated soil was excavated and transported to Dutch Harbor for thermal treatment. A passive bioventing system was installed within POL-contaminated subsurface soil to promote natural biodegradation of remaining contaminants. The site was covered with clean soil, graded, fertilized, and reseeded.

Numerous whale oil tanks, considered historically significant by the State Historical Preservation Office, were cleaned and relocated to the Eastern Bench Area. Other artifacts found at the site were turned over to Akutan Corporation for display in the local museum and the museum on Unalaska Island. No significant archeological or cultural sites or artifacts are known to remain at the site.

2.10 SAMPLING STRATEGY

Most of the field sampling took place during RI activities in 1996, 1997, and 1998. The primary objectives of RI activities were to define the horizontal and vertical extent of hydrocarbon contamination at the site, document the concentration of remaining contamination in areas of soil excavation, and provide data for comparison of background soil, sediment, surface water, and groundwater with similar onsite media. During RI activities, over 200 samples were collected from various media, including surface soil, subsurface soil, freshwater sediments, marine sediments, and groundwater. Information obtained from the RI was used for completion of a human health and ecological baseline remedial action, completed in 1998.

2.11 KNOWN OR SUSPECTED SOURCES OF CONTAMINATION

The primary source of contamination at the site was the ASTs and associated piping that contained free product; the secondary source of contamination was residual subsurface POL-

contaminated soil left in place after the IRA and residual contamination in marine sediment from historical fuel spills.

2.12 TYPES OF CONTAMINATION AND THE AFFECTED MEDIA

Contamination remains in two media at the former Akutan NS site: inland soil and marine sediments (Figures 3 and 4). Isolated areas of inland soil in the Central Bench Area have contamination exceeding the maximum allowable DRO concentration of 12,500 mg/kg established by ADEC. Limited petroleum-hydrocarbon contamination is also present within the intertidal and subtidal marine sediments adjacent to the shoreline.

2.13 LOCATION OF CONTAMINATION AND KNOWN/POTENTIAL ROUTES OF MIGRATION

Based on soil sampling and analytical data, isolated inland soil hot spots in the Central Bench Area exceed the maximum allowable DRO concentration of 12,500 mg/kg established by ADEC. Potential routes of contaminant migration include:

- Leaching from residual subsurface soil into groundwater and groundwater discharge to marine water
- Residual contamination in sediment releasing contaminants into marine water
- Contaminated groundwater traveling overland or discharging to surface seeps or directly to marine water and marine sediment
- Contaminants in marine sediment and marine water taken up and accumulated in marine organisms

Based on analytical data, information from the biological assessment, hydrocarbon chromatogram reviews, toxicity testing results, and visual observations made during sampling and test pit excavation activities, DoD-related contamination has impacted localized areas of intertidal and subtidal marine sediments located slightly to the east and west of the former NS dock. Contamination within these areas is suspected to have originated from historical overland flow from the Central Bench Area. When disturbed, these sediments produce a hydrocarbon sheen, violating ADEC regulatory standards for surface water quality.

2.14 CURRENT AND POTENTIAL LAND AND WATER USES

2.14.1 Land Use

The former Akutan NS lies on two adjacent parcels of private property. The western portion is owned by Akutan Corporation and the larger, eastern parcel is owned by Trident Seafoods Corporation. Currently the site is not being used, but the landowner plans to use the area as a storage area.

2.14.2 Groundwater Use

Currently, there is no groundwater use in the vicinity of the former Akutan NS; however, groundwater at the site is considered a potential drinking water source. Consequently, groundwater contaminant concentrations have been compared to the groundwater cleanup levels promulgated in Table C of 18 AAC 75.345. Groundwater results were also compared to ADEC marine surface water standards (18 AAC 70) to assess potential ecological effects to the marine environment adjacent to the site.

2.14.3 Surface Water Use

While there is no current or anticipated surface-water use in the vicinity of the former Akutan NS, the site contains several first-order ephemeral streams running in a generally northward direction that terminate in Akutan Harbor. During the 2000 Marine Sediment RI, five onsite drainages were observed that contained flowing surface water; one was located near the eastern end of the Central Bench Area, and the other four were located below the western Bluff Area. Surface-water flow in these drainages was estimated to be between 1 and 15 gallons per minute.

2.15 SUMMARY OF SITE RISKS

A risk evaluation was conducted for the former Akutan NS to evaluate potential impacts from remaining DRO and RRO contaminants to receptors working in, inhabiting, or visiting the affected areas. Inland soil contamination was evaluated through an IRA, RI, and quantitative human health and ecological risk assessment completed in 1996 and 1997 (USAED 1998).

To evaluate the risks posed to the marine environment, a marine sediment RI was conducted in August 2000. Chemical, biological, and toxicological data were collected to assess ecological risk to both the intertidal and subtidal marine environment from past petroleum spills and from potentially contaminated groundwater seeps.

Detailed information on human health and ecological risks from the remaining contaminants at the site is included in the following subsections.

2.15.1 Summary of Human Health Risk Evaluation

The baseline risk evaluation estimates the risks posed by POL contaminants remaining at the site if no action were taken. It provides the basis for taking action and identifies the contaminants and potential exposure pathways that need to be addressed by the selected remedial action. This section of the DD summarizes the results of the baseline risk evaluation for this site.

Identification of Contaminants of Concern

COCs remaining at the former Akutan NS site include DRO and RRO. These POLs remain within the Central Bench and Bluff Areas and the intertidal and subtidal Marine Areas.

DRO was detected in two soil samples collected from the Bluff Area at concentrations above the ADEC Method Two maximum allowable concentration of 12,500 mg/kg. The highest DRO concentration detected in Bluff Area soil was 31,800 mg/kg; the average DRO concentration was 7,614 mg/kg, based on a 95 percent upper confidence level on the mean. This average concentration is less than the ADEC Method Two soil cleanup levels protective of residential inhalation and ingestion and equals a hazard quotient of less than 1.

The RRO concentration in one soil sample collected from the Bluff Area exceeded the ADEC Method Two maximum allowable concentration of 22,000 mg/kg, with a total 36,600 mg/kg; the average RRO concentration at the site was determined to be below Method Two levels.

Even though DRO and RRO concentrations were detected above Method Two cleanup concentrations in the Bluff Area soil, average concentrations remained within allowable limits, and the risk to human and ecological receptors was determined to be acceptable.

Other COCs tested for in soil samples collected from the site included polychlorinated biphenyls, pesticides, and trace metals. These analytes were either not detected, were below ADEC Method Two cleanup concentrations, or were determined not to be a risk to human or ecological receptors, and were eliminated as COCs for the site.

Exposure Assessment

The objective of an exposure assessment is to identify potential contaminant exposure scenarios by which the POL remaining in site media could be contacted by humans and to quantify the intensity and extent of that exposure. The assessment considers current and potential future uses of the site, potentially exposed populations, exposure pathways, and potential intake of each COC from each contributing medium for the population at risk. CSMs depicting potential receptors and exposure pathways from remaining contamination in the inland soil and intertidal and subtidal sediments are shown in Figures 6 and 7.

The 1998 RI report concluded that the risk to human health or ecological receptors from exposure to mean residual DRO concentrations in surface or subsurface soil is acceptable. However, some isolated inland soil hot spots in the Central Bench Area exceed the maximum allowable DRO concentration of 12,500 mg/kg. The selected remedial alternative for the soil medium was developed to address these localized hot spots. The FFS (USAED 2003) includes a more thorough discussion of the exposure assessment for DRO in inland soils.

Toxicity Assessment

The human health toxicity assessment quantified the relationship between estimated exposure (dose) to a COPC and the increased likelihood of adverse effects. Risks of developing cancer due to site exposure are evaluated based on toxicity factors (i.e., cancer slope factors) published in the U.S. Environmental Protection Agency (EPA) Integrated Risk Information

System. Quantification of non-cancer injuries relies on EPA-published reference doses (RfD) (EPA 1996).

Cancer slope factors are used to estimate the probability that a person *may* develop cancer given exposure to site-specific contaminants. This site-specific risk is in addition to the risk of developing cancer from other causes over a lifetime. Consequently, the risk estimates generated in risk assessments are referred to as "incremental" or "excess lifetime" cancer risks.

RfDs represent a daily contaminant intake below which no adverse human health effects are expected to occur to the most sensitive subpopulations (children, the elderly, pregnant women, etc.). To evaluate non-carcinogenic health effects, the human health impact of contaminants is approximated using a hazard quotient, which is calculated by comparing the estimates of site-specific human exposure doses to RfDs. Values of less than 1 indicate that non-cancer effects are unlikely to result from exposure to a site contaminant.

Risk Characterization

Risk-screening results for inland soil at the former Akutan NS site indicate that the average DRO concentration, based on a 95 percent upper confidence limit on the mean remaining in surface and subsurface soil throughout the Central Bench Area, is less than the level of concern using risk-based concentrations or ADEC Method Two soil cleanup levels. The baseline risk assessment (based on the current and reasonably expected future use of the site) concluded that the calculated risk is within acceptable levels for human health or ecological receptors (i.e., hazard quotient less than 1).

2.15.2 Summary of Ecological Risk Evaluation

The Marine Area sediment also contained POL constituents above background levels and sediment quality guidelines in select locations. Elevated POL levels in these sediments, when disturbed, can produce sheen on the surface water, violating 18 AAC 70.020 water quality standards, which state that surface waters must be free of sheen. The 2000 Marine Sediment

RI attributed the elevated levels of organic compounds in sediments to previous DoD activities and other nondistinguishable sources, thought to include biogenic sources, seafood processing waste, creosote-treated wood, coal, and other unknown sources.

Results of the biological assessment, including an evaluation of the presence and/or absence of petroleum-sensitive species, indicate only limited impacts (i.e., stressed biological communities or taxa) to biological resources, even within areas identified as containing contamination.

2.15.3 Basis for Response Action

As a result of the DRO exceedances of the ADEC maximum allowable concentrations in inland soil within the Central Bench Area and because of the continued sheen presence in surface water in the Marine Area, further remedial action is necessary. In 2003, USACE prepared a FFS to develop and evaluate remedial alternatives for marine sediments, inland soil, and groundwater. The FFS was used to support a risk-management decision for the remedial actions selected at the former Akutan NS.

A response action is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances and contaminants that still exist in the inland soil and marine sediment of the former Akutan NS site.

2.16 REMEDIAL ACTION OBJECTIVE

The RAO for the former Akutan NS consists of medium-specific (soil and groundwater) goals for protecting site workers and the adjacent nearshore marine environment from the elevated levels of POL remaining in the inland soil.

The select areas of inland soil with high contaminant levels will be covered with geotextile and clean fill to prevent current and future exposures. These hot spots will be further regulated through implementing informational institutional controls to prevent disturbance to these areas and proper soil management in the event they are disturbed. Intertidal and

subtidal marine sediments that contain elevated levels of residual contamination will be placed under reserved-use designation and regulated by ADNR. These remedial actions are in addition to the earlier removal action and restoration work completed in 1996.

The key cleanup requirements are State of Alaska cleanup levels as promulgated in 18 AAC 75. Method Two cleanup levels for the over 40-inch zone, found in 18 AAC 75.341, Tables B1 and B2, are relevant and appropriate cleanup levels for this site.

2.17 DESCRIPTION OF ALTERNATIVES

Soil in parts of the Central Bench Area that contains elevated DRO concentrations greater than the ADEC maximum allowable concentration requires further action. Further action is also necessary to address the hydrocarbon sheen produced when marine sediment in the Marine Area is disturbed. The following sections describe remedial alternatives for elevated POL concentrations remaining in the inland soil (Section 2.17.1) and marine sediments (Section 2.17.4) that have been determined to present a potential risk to human health or the environment.

Results of the groundwater monitoring program performed at the site show that the groundwater meets the cleanup standards; therefore, groundwater does not pose an unacceptable risk and no action is necessary for groundwater.

2.17.1 Inland Soil

Description of Remedy Components for Inland Soil

The following four remedial alternatives were considered for inland soil.

Alternative 1 - No Action Alternative for Inland Soil. Under the No Action alternative, no additional remedial measures would be taken at the site. The No Action alternative does not include monitoring, informational institutional controls, or future use restrictions of any kind, as follows:

- Treatment Components: None

- Containment (or Storage) Components: None
- Informational Institutional Control Components: None
- O&M Activities: None
- Monitoring Requirements: None

Development of the No Action alternative provides a basis of comparison for the remaining alternatives. This alternative serves as a baseline by reflecting current conditions without any additional effort or controls. No costs are associated with the No Action alternative.

Alternative 2 - Informational Institutional Controls for Inland Soil

- Treatment Components: None.
- Containment (or Storage) Components: None.
- Informational Institutional Control Components: An informational institutional control in the form of a deed notice would be filed with the Aleutian Islands Recording District and used to notify potential future owners of the presence of contamination within the inland soil areas at the former Akutan NS. In the event contaminated soil was encountered through construction or other intrusive activities, the soil would need to be properly managed under state laws and regulations.
- O&M Activities: None.
- Monitoring Requirements: None.

Alternative 3 - Limited Cover and Informational Institutional Controls for Inland Soil

- Treatment Components: None.
- Containment (or Storage) Components: Inland surface and subsurface soil in the areas where DRO concentrations are greater than the ADEC maximum allowable concentration would be covered with a layer of semipermeable geotextile and a minimum cover of 2 feet of clean soil, graded, and reseeded.
- Informational Institutional Control Components: Informational institutional controls in the form of a deed notice would be filed with the Aleutian Islands Recording District and used to notify potential future owners of the presence of contamination within the inland soil areas at the former Akutan NS. In the event contaminated soil was encountered through construction or other intrusive activities, the soil would need to be properly managed under state laws and regulations.
- O&M Activities: Some maintenance may be necessary to assure that the cover continues to promote drainage, accommodate settling and subsidence, and function with minimum maintenance. Erosion or abrasion damage will need repair.

- Monitoring Requirements: A periodic inspection and monitoring program is necessary under this alternative to ensure the cover remains effective in eliminating unacceptable risks and potential exposure pathways.

Alternative 4 - Cover and Informational Institutional Controls for Inland Soil

- Treatment Components: None.
- Containment (or Storage) Components: This alternative is identical to Alternative 3 except that one contiguous cover would extend over all areas with DRO concentrations greater than the ADEC maximum allowable concentrations as well as areas that did not exceed the ADEC criteria.
- Informational Institutional Control Components: Informational institutional controls in the form of a deed notice would be filed with the Aleutian Islands Recording District and used to notify potential future owners of the presence of contamination within the inland soil areas at the former Akutan NS. In the event contaminated soil was encountered through construction or other intrusive activities, the soil would need to be properly managed under state laws and regulations.
- O&M Activities: Some maintenance may be necessary to assure that the cover continues to promote drainage, accommodate settling and subsidence, and function with minimum maintenance. Erosion or abrasion damage will need repair.
- Monitoring Requirements: An inspection and monitoring program is necessary under this alternative to ensure the cover remains effective in eliminating any unacceptable risks and potential exposure pathways.

Common Elements and Distinguishing Features of Each Alternative

Key Cleanup Requirements for Inland Soil. The key cleanup requirements for inland soil (Section 2.20.5) are the same for each of the alternatives.

Long-Term Reliability of Remedy. Long-term reliability, as gauged by the potential for failure of the remedy, would not apply to the No Action alternative. The informational institutional controls in Alternatives 2 and 3 would both have very low potential for failure and would thus be reliable. Both the limited and complete covers called for in Alternatives 3 and 4 have some potential for failure due to erosion, poor construction, or other factors. Despite these factors, institutional controls in addition to cover placement would have greater long-term reliability than institutional controls alone because placing cover limits exposure to contaminants and there is only a slight chance of failure. The complete cover in Alternative 4

would be more reliable than the partial cover in Alternative 3 since the covering would be continuous rather than selective.

Quantity of Untreated Waste and Treatment Residuals to Be Disposed of Offsite or Managed Onsite. All four alternatives would result in local hot spots remaining onsite. For Alternatives 2, 3, and 4, the soil would be managed onsite to limit exposure either by informational institutional controls or soil cover.

Estimated Time for Design and Construction. An implementation timeframe for the No Action alternative would not apply, as there would be no design or construction. Implementation timeframe for Alternatives 2, 3, and 4 would be approximately 6 weeks, 2 months, and 3 months, respectively.

Estimated Time to Reach Remediation Goals. The No Action alternative has no remediation goal. For Alternatives 2, 3, and 4, the remediation goal would be met when the action is taken. Estimated time to reach the remediation goals for Alternatives 2, 3, and 4 would be approximately 6 weeks, 2 months, and 3 months, respectively.

Estimated Costs. The No Action alternative would have no costs. The costs for Alternatives 2, 3, and 4 would be approximately $15,000, $806,000, and $1,702,000, respectively.

Expected Outcomes of Each Alternative

No Action Alternative. Protection of the environment would not be achieved, and areas of potential exposure of workers to POL hot spots would remain. Without informational institutional controls, there would be no assurance that contaminated soil or intrusive activities would be properly managed.

Informational Institutional Controls for Inland Soils. Protects human health and the environment by using informational institutional controls to control and protect workers excavating localized hot spots. Informational institutional controls would also limit the

potential for contaminated soil to be relocated to areas where it may cause an unacceptable risk. No unacceptable short-term or cross-media impacts are expected.

Limited Cover and Informational Institutional Controls for Inland Soils. Protects human health and the environment from localized hot spots by eliminating exposure pathways and by use of informational institutional controls to manage soil and notify future potential landowners. Minimal short-term and cross-media impacts are expected.

Cover and Informational Institutional Controls for Inland Soils. Protects human health and the environment from localized hot spots as well as other affected areas by eliminating exposure pathways and by use of informational institutional controls to manage soil and notify future potential landowners. Minimal short-term and cross-media impacts are expected.

2.17.2 Marine Sediment

Description of Remedy Components for Marine Sediment

The following five remedial alternatives were considered for marine sediment.

Alternative 1 - No Action Alternative for Marine Sediment. Under the No Action alternative, no additional remedial measures would be taken at the site. The No Action alternative does not include monitoring, informational institutional controls, or future use restrictions of any kind, as follows:

- Treatment Components: None
- Containment (or Storage) Components: None
- Informational Institutional Control Components: None
- O&M Activities: None
- Monitoring Requirements: None

Development of the No Action alternative provides a basis of comparison to the remaining alternatives. This alternative serves as a baseline by reflecting current conditions without any

additional effort or controls. The No Action alternative was evaluated, consistent with the NCP requirements. No costs are associated with the No Action alternative.

Alternative 2 - Limited Monitoring and Reserved-Use Designation for Marine Sediments

- Treatment Components: None.
- Containment (or Storage) Components: None.
- Informational Institutional Control Components: The intertidal and subtidal areas would be placed into reserved-use designation under the jurisdiction of ADNR, which would regulate activities within this area by performing consistency reviews and notifying the public of the proposed activities within this area.
- O&M Activities: None.
- Monitoring Requirements: The limited monitoring program would involve visual inspections of the surface water and marine sediments identified as having hydrocarbon contamination. The presence of hydrocarbon sheen would be documented with photographs. The requirement for continuation of the monitoring program would be evaluated after 5 years.

Alternative 3 - Long-Term Monitoring and Reserved-Use Designation for Marine Sediments

- Treatment Components: None.
- Containment (or Storage) Components: None.
- Informational Institutional Control Components: The intertidal and subtidal areas would be placed into reserved-use designation under the jurisdiction of ADNR, which would regulate activities within this area by performing consistency reviews and notifying the public of the proposed activities within this area.
- O&M Activities: None.
- Monitoring Requirements: The long-term monitoring program would consist of performing a biological assessment of the intertidal and subtidal areas similar to the biological assessment performed during the 2000 Marine Sediment RI. Biological surveys would be performed in years 1, 3, and 5 of a 5-year monitoring program.

Alternative 4 - Cover and Informational Institutional Controls for Marine Sediments

- Treatment Components: None.
- Containment (or Storage) Components: Marine sediments with fuel and PAH compound concentrations greater than the applicable requirements would be covered with riprap to ensure that a minimum of 2 feet of clean material overlies the areas.

- Informational Institutional Control Components: The intertidal and subtidal areas would be placed into reserved-use designation under the jurisdiction of ADNR, which would regulate activities within this area by performing consistency reviews and notifying the public of the proposed activities within this area.
- O&M Activities: None.
- Monitoring Requirements: None.

Alternative 5 - Excavation, Dredging, and Disposal for Marine Sediments

- Treatment Components: Excavated or dredged sediment would be properly contained and characterized for POL type and concentration.
- Containment (or Storage) Components: Any dredged or excavated material would be properly contained under state regulations and guidelines.
- Informational Institutional Control Components: None.
- O&M Activities: None.
- Monitoring Requirements: None.

Common Elements and Distinguishing Features of Each Alternative

Key Cleanup Requirements. The key cleanup requirements for marine sediment, as listed in Section 2.20.5, are the same for each of the alternatives.

Long-Term Reliability of Remedy. Long-term reliability, as gauged by the potential for failure of the remedy, would not apply to the No Action alternative. The informational institutional controls in Alternatives 2, 3, and 4 would have very low potential for failure and thus be reliable. Both the limited and long-term monitoring in Alternatives 2 and 3 would also have a low potential for failure and should prove to be highly reliable. The cover called for in Alternative 4 has a slight potential to fail due to erosion, poor construction, or other factor, however, would provide more protection from contaminated soil. The excavation, dredging, and disposal in Alternative 5 would be the most reliable remedy because it would eliminate risk by reducing chemical concentrations and eliminating exposure pathways.

Quantity of Untreated Waste and Treatment Residuals to be Disposed of Offsite or Managed Onsite. Alternatives 1, 2, 3, and 4 would result in localized hot spots remaining onsite. For Alternatives 2, 3, and 4, the soil would be managed onsite, and access would be monitored

either by informational institutional controls (through reserved-use designation) or cover. Alternative 5 would result in disposal of all contaminated sediment offsite.

Estimated Time for Design and Construction. Implementation timeframe for the No Action alternative would not apply, as there would be no design or construction. The implementation timeframe for Alternatives 2 and 3 is estimated to be approximately 5 years. The implementation timeframe for Alternatives 4 and 5 would be on the order of 2 to 3 months.

Estimated Time to Reach Remediation Goals. For each alternative, the remediation goal would be met when the action is taken. No remediation goal exists for the No Action alternative. The estimated time to reach remediation goals for Alternatives 2 and 3 is approximately 5 years. The estimated time to reach the remediation goals for Alternatives 4 and 5 is 2 to 3 months.

Estimated Costs. The No Action alternative would have no costs. Costs for Alternatives 2, 3, 4, and 5 would be approximately $133,000, $276,000, $567,000, and $847,000, respectively.

Expected Outcomes of Each Alternative

No Action Alternative. Does not protect the environment from adverse impacts caused by existing contamination and from water quality violations (presence of sheen).

Limited Monitoring and Reserved-Use Designation. Protects the environment by conducting visual monitoring to identify any trends related to the amount or extent of sheen along the shoreline. No unacceptable short-term or cross-media impacts are expected. Under reserved-use designation, ADNR would have jurisdiction over activities in the intertidal and subtidal zones and potential future users of this area.

Long-Term Monitoring and Reserved-Use Designation. Protects the environment by continuing to monitor and verify results from previous ecological surveys that indicate limited adverse impacts. No unacceptable short-term or cross-media impacts are expected. Under

reserved-use designation, ADNR would have jurisdiction over activities in the intertidal and subtidal zones and potential future users of this area.

Cover and Reserved-Use Designation. Protects the environment by eliminating exposure pathways and invoking informational institutional controls. Minimal short-term and cross-media impacts are expected. Under reserved-use designation ADNR would have jurisdiction over activities in the intertidal and subtidal zones and potential future users of this area.

Excavation and Disposal. Protects the environment by reducing chemical concentrations and eliminating exposure pathways. Short-term and cross-media impacts are expected.

2.18 COMPARATIVE ANALYSIS OF ALTERNATIVES

This section evaluates the relative performance of each alternative against the others in accordance with the nine evaluation criteria. The nine criteria are presented for inland soil and marine sediments. The FFS (USAED 2003) contains detailed analysis of alternatives.

2.18.1 Overall Protection of Human Health and the Environment

This criterion addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, and/or informational institutional controls.

Inland Soil

All of the alternatives except the No Action alternative would provide adequate protection of human health and the environment by eliminating, reducing, or controlling risk through treatment, engineering controls, and/or informational institutional controls. Alternatives 3 and 4 would reduce impacts by eliminating exposure pathways to contamination. Alternative 2 would protect the environment by documenting residual soil contamination and the need to manage it properly in the future.

Because the No Action alternative for inland soils is not protective of human health and the environment, it was eliminated from consideration under the remaining eight criteria.

Marine Sediments

All of the alternatives except the No Action alternative would provide adequate protection of the environment by eliminating, reducing, or controlling risk through treatment, engineering controls, and/or informational institutional controls. COCs would be reduced below risk-based levels through application of Alternative 5. Alternative 4 would reduce impacts by eliminating exposure pathways to contamination. Alternatives 2 and 3 would protect the environment by continuing to monitor and verify whether the limited impacts and sheen are attenuating. Because the No Action alternative for marine sediments is not protective of the environment, it was eliminated from consideration under the remaining eight criteria.

2.18.2 Compliance with Cleanup Requirements

This criterion addresses whether a remedy will meet all of the cleanup requirements of federal and state environmental statutes or provides a basis for invoking a waiver.

Inland Soil

All alternatives, with the exception of the No Action alternative, would meet the respective cleanup requirements established by federal and state laws.

Marine Sediments

The alternatives, with the exception of No Action and Informational Institutional Controls only, would meet the respective cleanup requirements established by federal and state laws. Monitoring is required to determine whether sheen is attenuating and Alaska Water Quality Standards will be met.

2.18.3 Long-Term Effectiveness and Permanence

This criterion evaluates the ability of an alternative to maintain protection of human health and the environment over time.

Inland Soil

Alternative 2 offers no risk reduction because risk would be managed through informational institutional controls to warn potential purchasers in the event the property was transferred. Alternatives 3 and 4 would reduce risk by limiting exposure pathways to the localized hot spots. A long-term monitoring program would be used to ensure the cover remains intact and protective. Informational institutional controls would be used to warn prospective purchasers, control intrusive activities, and ensure contaminated soil is managed properly.

A 5-year review would be performed for Alternatives 2, 3, and 4 to ensure the selected remedy continues to be effective.

Marine Sediments

Alternatives 2 and 3 offer no risk reduction because risk is managed through monitoring to verify the previous findings of no adverse impacts. Intertidal activities would be limited and managed by ADNR through reserved-use designation. Alternative 4 eliminates the exposure pathway to the limited hot spots. Reserved-use designation would be used to manage intrusive activities in this area. Alternative 5 permanently eliminates the risk through excavation and disposal of remaining hot spots.

2.18.4 Reduction in Toxicity, Mobility and Volume through Treatment

This criterion evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

Inland Soil

Alternatives 2, 3, and 4 offer potential reduction of volume over time from attenuation; however, reduction of volume is not verifiable. Toxicity would be reduced by using earthen covers to limit exposure, and placement of informational institutional controls would limit access to contamination. Localized hot spots with DRO levels greater than 12,500 mg/kg would remain onsite; however, the risk has been determined to be acceptable. Mobility and

volume would remain the same as current conditions. Implementation of the alternatives is reversible.

Marine Sediment

Alternatives 2 and 3 and Alternative 4 provide potential reduction in contaminant volume from attenuation over time; however, volume reduction would not be verifiable. These alternatives would continue to evaluate the conditions and levels of low toxicity and low mobility over time through visual monitoring and controlling intertidal and subtidal activity. Implementation of the alternatives is reversible. Alternative 5 would effectively reduce mobility, toxicity, and the volume of contaminated sediment.

2.18.5 Short-Term Effectiveness

This criterion evaluates the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation. Workers conducting remedial actions are required to wear protective clothing and equipment to minimize potential exposure.

Inland Soil

Implementation of Alternative 2, 3, or 4 will result in minimal risk to site workers. No short-term impacts to the community or environment would occur during cover construction. Risk from future soil excavation is acceptable with proper personal protective equipment (PPE) and the soil management practices included in the informational institutional controls. Estimated time to achieve protection is 1 to 2 months.

Marine Sediment

The short-term effectiveness of Alternatives 2 and 3 would add minimal risk to site workers and the environment during monitoring and no additional risk to the community. Time until protection is achieved is estimated at 5 years. Alternative 4 would add minimal risk to site workers during cover construction. Some short-term impacts to the environment would occur during riprap placement. No increased risk to the community would be incurred during

implementation. Estimated time to achieve protection is 2 to 3 months. Alternative 5 would add minimal risk to site workers during excavation/dredging activities as release of contaminants to the environment would be expected during these activities. Time to achieve protection is estimated to be 2 to 3 months.

2.18.6 Implementability

This criterion evaluates the technical and administrative feasibility of implementation of each alternative. Factors associated with implementability include the ease of construction, the availability and capacity of materials and/or facilities, and logistical and/or administrative practicability.

Inland Soil

All technologies and remedies for inland soil are readily available and easily implemented.

Marine Sediment

All technologies and remedies for marine sediments are readily available and easily implemented.

2.18.7 Cost

This criterion includes estimated capital and O&M costs as well as present-worth costs.

Inland Soil

Alternative 2 is estimated at approximately $15,000.

Alternatives 3 and 4 are estimated at $806,000 and $1.7 million, respectively, including costs associated with 5 years of monitoring.

Marine Sediment

Alternative 2 and 3 would cost $66,000 and $183,000, respectively, including costs associated with 5 years of monitoring.

Alternative 4 is estimated at approximately $519,000.

Alternative 5 is the most expensive, with costs estimated at approximately $775,000.

2.18.8 State Acceptance

This criterion evaluates whether the State of Alaska agrees with the analysis and recommendations resulting from the RI and the Proposed Plan.

Inland Soil

The State of Alaska supports the preferred alternative for inland soil.

Marine Sediment

The State of Alaska supports the preferred alternative for marine sediment.

2.18.9 Community Acceptance

Based on verbal and written feedback on the Proposed Plan outlining the selected remedies for the site, the local community agrees with the USAED and ADEC analysis and recommendation of the preferred alternative.

Selected Remedies for Inland Soil and Marine Sediments

No negative verbal or written comments were received on the selected remedies of limited cover areas for inland soil and reserved use designation for the marine sediment. The only questions posed during the public comment period and public meeting were regarding clarification on reserved-use designation and deed notices, the USACE's continuing responsibility for the remaining contamination, a question on natural attenuation, and whether the State supports the selected remedies.

2.19 PRINCIPAL THREAT WASTE

The NCP establishes an expectation that treatment will be used to address the principal threats posed by a site wherever practicable. In general, principal threat wastes are those source

materials considered to be highly toxic or highly mobile that usually cannot be contained in a reliable manner or that would present a significant risk to human health or the environment, should exposure occur. Conversely, nonprincipal threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure.

The soil and sediment contamination at Akutan does not constitute a principal threat waste because the contamination is not subject to CERCLA requirements. Additionally, the soil and sediment contamination at Akutan is relatively immobile, is unlikely to either become airborne or reach groundwater, and is at a relatively low concentration.

2.20 SELECTED REMEDY

Based on the results of the FFS, USACE has selected Inland Soil Alternative 3 (Limited Cover and Informational Institutional Controls) and Marine Sediment Alternative 2 (Limited Monitoring and Reserved-Use Designation) as the preferred remedial actions. The groundwater medium does not warrant remedial action, based on the results from the groundwater monitoring program. Therefore, USACE has determined groundwater requires no further action.

2.20.1 Summary of the Rationale for the Selected Remedy

Inland Soil

Alternative 3 would be effective in eliminating potential exposure routes to DRO-contaminated surface and subsurface soil by placing a cover over the hot spots, establishing procedures for eliminating potential exposure routes, and managing contaminated soil, if encountered. Informational institutional controls include deed notices or restrictions that notify potential future landowners of the presence of residual contamination at the site and the need for special handling of the contaminants. Informational institutional controls would document that residual petroleum-contaminated soil exists on the property and needs to be managed in accordance with existing laws and regulations.

Marine Sediment

Alternative 2 meets applicable requirements by visually monitoring for impacts from hydrocarbons remaining in marine sediments and minimizes potential exposure routes through reserved-use designation. Through the reserved-use classification, ADNR will manage activities within intertidal and subtidal areas by public notification and by performing consistency reviews with regard to any proposed activity that may potentially disturb remaining hydrocarbon contamination within the marine sediment.

2.20.2 Description of the Selected Remedy

Inland Soil

Alternative 3 uses a combination of technologies: covering limited areas and implementing informational institutional controls. Inland surface and subsurface soil in hot-spot areas with DRO concentrations greater than the ADEC maximum allowable concentration would be covered. This cover would be designed to promote drainage, be minimally affected by erosion or abrasion, accommodate settling and subsidence, and function with minimum maintenance. A monitoring program is necessary under this alternative to ensure the cover remains effective in limiting potential exposure to subsurface contamination.

Inland surface and subsurface soil in areas with DRO concentrations greater than 12,500 mg/kg would be covered with a geotextile liner and a minimum of 2 feet of clean soil. The total thickness of the cover would be a minimum of 2 feet to accommodate settling, subsidence, and erosion. Cover areas would be revegetated using grasses indigenous to the area that would assist in minimizing erosion. The cover would be constructed using clean backfill material from an offsite borrow source (most likely Dutch Harbor).

A preconstruction land survey would be performed in areas where cover would be installed. The survey would be performed prior to placing any backfill material, and grade stakes would be set. An as-built figure would be generated from a post-construction survey after backfill

material is placed and graded. The land survey would assist in ensuring that the minimum thickness of cover material is placed over the areas and positive drainage is maintained.

A monitoring program is required under this alternative to ensure the cover remains intact to eliminate unacceptable risks and potential exposure pathways. The cover-monitoring program would include periodic inspections of the cover (as many as four per year) between June and September of each year over a 5-year period. These inspections would be performed by a qualified local resident. Visual inspections of the cover for damage or erosion would be performed during each monitoring event. Monitoring reports would be submitted to ADEC.

Also included in this alternative is an informational institutional control in the form of a deed notice to document that inland soil contamination remains at the site and that, if uncovered during construction activities, the soil must be managed in accordance with existing state laws and regulations. USACE will facilitate filing of the deed notice with the Aleutian Islands Recording District (ADNR) and distribute copies to all stakeholders.

Marine Sediment

Alternative 2 involves a limited visual-monitoring program and implementation of reserved-use designation for nearshore marine sediment. This alternative would be implemented for subtidal and intertidal areas identified as containing hydrocarbon contamination (between transects 03 and 12, Figure 4).

A limited monitoring program would be implemented using visual inspections of surface water and marine sediments identified as having residual hydrocarbon contamination. Monitoring would be conducted up to four times per year, once per month from June through September, over a 5-year period. At the end of 5 years, a review of the monitoring program results would be conducted to determine if continued monitoring is necessary.

Monitoring observations (i.e., presence of a hydrocarbon sheen) would be supported by photographic and written documentation. Monitoring reports would be submitted to ADEC. Sediments would not be disturbed during monitoring. Should intertidal sediments be capped

in the future or other approved remedial activities completed, the monitoring program would be discontinued.

ADNR, at the request of USACE will place the intertidal area into reserved-use designation that will become a permanent part of the public land records associated with the site. This designation will allow ADNR to regulate activities within this area by reviewing permit requests, performing consistency reviews, and notifying the public of proposed activities. The reserved-use designation would be filed and distributed by ADNR Division of Mining, Land and Water to the appropriate agencies including ADEC, USACE, and the Borough.

2.20.3 Summary of Estimated Remedy Costs

Costs are based on 2003 pricing compiled when the FFS was completed. These costs have been escalated to reflect anticipated 2006 costs.

Inland Soil

Alternative 3 would cost an estimated $806,000, including costs associated with 5 years of monitoring.

Marine Sediment

Alternative 2 would cost an estimated $85,000, including costs associated with 5 years of monitoring.

2.20.4 Expected Outcomes of the Selected Remedy

Inland Soil

Alternative 3 would reduce the risk of exposure to DRO-contaminated soil by covering the localized hot spots with clean fill. This cover would be designed to promote drainage, minimize erosion or abrasion, accommodate settling and subsidence, and function with minimum maintenance. The construction of a cover to meet these design criteria would provide an effective, long-term engineering control to eliminate the exposure pathway to contaminated inland soil. A monitoring program would be implemented to ensure the cover

remains protective. After placement of the cover, no maintenance activity is anticipated; however, if the cover does require maintenance, additional cover material would be placed over the original material to accommodate any settling, subsidence, or erosion or to promote drainage.

Informational institutional controls would be developed and maintained as an effective notification tool, incorporating a deed notice into land records to inform potential future owners of the nature and extent of remaining contamination and the requirements for handling, if encountered. This deed notice would be filed with the Aleutian Islands Recording District (ADNR) and copies distributed to all stakeholders.

Marine Sediments

Alternative 2 does not actively address contaminated marine sediment. The program would only evaluate and monitor the natural attenuation anticipated to take place after removal of the majority of the inland POL contamination and placement of the cover. Sediments and surface water would be visually monitored to ensure that contaminants within the former Akutan NS site are not violating state water-quality regulations and adversely affecting the nearshore environment. The use of reserved-use designation to manage proposed activities would limit potential releases of remaining contamination into the environment. This designation would be filed by ADNR as requested by USACE as a permanent land record and distributed by ADNR to the appropriate agencies including ADEC, USAED, and the Borough. A 5-year review of the monitoring program's results would be conducted to determine if the program should be continued.

2.20.5 Statutory Determinations

Under CERCLA Section 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with requirements (unless a statutory waiver is justified), are cost effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. CERCLA includes a preference for remedies that employ treatment that permanently and

significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal element as well as a bias against offsite disposal of untreated wastes. The following subsections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

Inland Soil. Alternative 3 would protect human health and the environment by limiting exposure pathways to remaining DRO-contaminated soil through use of a cover and informational institutional controls in the form of a deed notice to warn prospective purchasers and protect future workers from excavating into DRO-contaminated soil in the subsurface. Informational institutional controls would also document the need to ensure the soil is properly managed under state regulations. Short-term impacts during future excavations would be limited through use of PPE and proper soil-management procedures. No cross-media impacts are expected from this alternative.

Marine Sediments. Alternative 2 involves limited monitoring and implementation of reserved-use designation. The limited monitoring program would involve visual inspections of marine sediment in areas containing high hydrocarbon concentrations, for adverse impacts to the environment. Potential impacts include sheen on the sediment or surface water. The program would also monitor natural attenuation in the sediment and manage proposed activities in the tidal area. The reserved-use designation would ensure any proposed intrusive activities are reviewed and managed by ADNR and the public is notified. No cross-media impacts are expected from this alternative.

Compliance with Requirements

Inland Soil. Alternative 3 would comply with all potential action-specific and location-specific requirements. Alternative 3 is anticipated to meet the potential chemical-specific requirements related to ADEC standards for DRO cleanup criteria in soil by:

- Covering localized hot spots with soil DRO concentrations greater than 12,500 mg/kg with semipermeable geotextile and 2 feet of clean fill and monitoring would meet the relevant and appropriate requirements for cover criteria listed in 18 AAC 75.370.

- Use of informational institutional controls for site cleanup is promulgated in 18 AAC 75.375 and will be used to prepare the deed notice for this site.
- ADEC draft guidance on using informational institutional controls for soil and other hazardous substance cleanups will be reviewed and used as to-be-considered guidance to prepare the informational institutional controls for this site.
- The EPA Region 10 Final Policy on the Use of Institutional Controls at Federal Facilities will be referenced as to-be-considered guidance to prepare the informational institutional controls for this site.

Marine Sediment. Alternative 2 would comply with all potential action-specific requirements because no active measures would be taken under this alternative, and therefore action-specific requirements would not be triggered. Alternative 2 is anticipated to meet the potential chemical-specific requirements related to contaminated marine sediments because:

- Exceedance of the chemical-specific to-be-considered effects range-median values from the National Oceanic and Atmospheric Administration (NOAA) SQuiRT tables (NOAA 1999) in marine sediments associated with the former Akutan NS is limited. The visual monitoring portion of this alternative would continue to determine whether the sheen is attenuating and will ultimately ensure the Alaska Water Quality Standards are being achieved. The reserved-use designation would ensure that any future activities in the tidal area are monitored and controlled. All intertidal and subtidal activities would fall under the jurisdiction of ADNR.
- The location-specific requirements, including the reserved-use designation, would fall under the jurisdiction of ADNR (as requested by USACE) and become a permanent part of the public land records recorded by ADNR and distributed to the appropriate agencies including ADEC, USAED, and the Borough. The monitoring program and reserved-use designation would ensure that no adverse impacts to the environment occur.

Cost Effectiveness

In the lead agency's judgment, the selected remedies for both the inland soil and marine sediment are cost effective and represent a reasonable value for the money proposed to be spent. In making this determination, the following definition from the NCP was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." (EPA 1994). The relationship of the overall effectiveness of the remedial alternatives was determined to be proportional to its costs, and hence these alternatives represent a reasonable value for the money to be spent.

Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable

Inland Soil. USACE has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable and cost-effective manner at the former Akutan NS. The selected remedy is easily implemented, and conventional materials and construction techniques would be used to construct the cover. No O&M requirements apply, other than monitoring. Equipment, materials, services, and specialists are readily available. Competitive bids can be obtained, and the remedy can be implemented within a short time. The selected remedy does not present short-term risks different from the other alternatives.

Marine Sediment. USACE has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable and cost-effective manner at the former Akutan NS. The selected remedy is easily implemented, and simple, standard methods would be used to perform monitoring activities. Equipment, materials, and services are readily available. No O&M requirements apply. Competitive bids can be obtained, and the remedy can be implemented in a short time. The selected remedy does not present short-term risks different from the other alternatives. No special implementability issues set the selected remedy apart from any of the other alternatives evaluated.

Preference for Treatment as a Principal Element

Inland Soil. Alternative 3 does not remove or treat DRO-contaminated soil. As a result, no special requirements or treatment processes are needed, and the amount of hazardous material destroyed or treated is zero. Alternative 3 will reduce the toxicity and mobility of the DRO-contaminated soil by eliminating the exposure pathway. The risk of DRO-contaminated soil remaining onsite would be acceptable after the soil is covered and an informational institutional control plan implemented. The statutory preference for remedies that employ treatment as a principal element is not satisfied. This process is reversible.

Marine Sediment. Alternative 2 does not remove or treat contaminated marine sediment. As a result, no special requirements or treatment processes are needed, and the amount of hazardous material destroyed or treated is zero. Alternative 2 would continue to allow low exposures from hydrocarbons and potential toxicity to epifauna from limited hot-spot contamination. This exposure risk would decrease over time, based on the previous inland soil source removal and on natural attenuation. Exposure would be monitored through a program conducted to evaluate potential adverse impacts to the environment and qualitatively monitor natural attenuation over a 5-year period. Reserved-use designation of the tidal area would minimize future releases of contaminants into the environment through activity management. The reserved-use designation would be filed and managed by ADNR and become a permanent part of the public land records associated with the property title to ensure that mobility and toxicity remain low by regulating intrusive activities.

Because no active treatment is used under this alternative, this process is reversible. The limited hot spots and associated risk would remain onsite. The risk of contaminated marine sediment remaining onsite would be acceptable and qualitatively verified using the visual monitoring program. This program will gather data to ensure no adverse impacts to the environment are occurring.

Five-Year Review Requirements

Inland Soil. A 5-year review would be required to evaluate the condition of the cover for erosion and subsidence.

Marine Sediment. A 5-year review would be required to evaluate monitoring results to decide if the program should be continued.

Documentation of Significant Changes

The Proposed Plan for the former Akutan NS was released for public comment at the beginning of April 2006. Due to weather delays, the public meeting was rescheduled to 24 May 2006 in Akutan. The public comment period was extended to 15 June to allow for

additional comments generated from the meeting. The selected remedy for inland soil is Alternative 3, and for marine sediment the selected remedy is Alternative 2. No significant comments were received during the public comment period. No significant changes to the remedy, as originally identified in the Proposed Plan, have been determined to be necessary or appropriate.

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PART 3: RESPONSIVENESS SUMMARY

A Proposed Plan for the former Akutan Naval Station was distributed to the residents of Akutan for review on 29 March 2006. A public meeting was held on 24 May 2006 in the school library to review the previous remedial and investigation actions, discuss the selected remedies, discuss the proposed 2006 field schedule, and answer questions from the public. The following is a summary of written and verbal comments received on the Proposed Plan.

1. David Griffin–ADNR. Letter to Tom Reed of the USACE received 4 May 2006 supporting all ADEC recommendations. The letter reminds USACE that ADNR authorization may be required for work on state lands requiring the use of heavy equipment for excavation or dredging activities.

   Response: Before any field work begins, the USACE will secure the proper permits and rights of entry to legally perform construction activities.

2. Joe Bereskin, Mayor, requested clarification on the term deed notice and how this institutional control would apply to Trident; and more importantly how this designation would ensure Trident complies with state soil management regulations when contamination is encountered.

   Response: A deed notice will notify current and future landowners of the presence of residual contamination at the site and the need for special handling of the contaminated media or treating or disposing of it properly. This notice would be placed on file with the Aleutians East Borough, the Registrar for Akutan. The deed notice would come into effect during transfer of the property to notify future potential land owners of the residual contamination and the proper handling requirements under ADEC regulations.

   The deed notice does not have any legal authority to restrict or require any action. It merely is a useful tool to convey information about the property to an interested party.

   USACE does not have any legal authority or responsibility to require the land owner to comply with State of Alaska environmental regulations. It is believed that a deed notice will provide useful information to current and future land owners, which may help them to comply with State of Alaska environmental regulations.

3. The Mayor also expressed concern for USACE's future responsibility addressing new or reoccurring problems resulting from historical contamination.

   Response: The liability of the Department of Defense for the FUDS contamination remains as long as there is contamination above ADEC cleanup

levels. If the site conditions change to the extent that there is a new exposure risk to human health or the environment, ADEC should be notified immediately. It is also requested that the USACE be notified.

4. The Mayor sent by email the following "P/Z met today and they didn't have much more to add…One question was what is going to happen with the old brick cookers that are still there? Being are they under some kind of historical preservation? Does anyone have control with that? We would also want to know when you have signed off and give control over to Trident, so the P/Z can work with Trident on what zoning might be given….Thanks and see you next month…Joe"

   Response: During its activities on the site, the USACE complied with all notification and preservation requirements of the National Historic Preservation Act. The local community should pursue its historic preservation concerns with the landowner and the Alaska State Historic Preservation Office.

5. Bill King, the pastor of the local church, asked about the natural attenuation process and if the process would be more efficient or accelerated, if cultured microbes were applied to the remaining petroleum contamination at the site.

   Response: The soil at the site contains naturally occurring microbes that will gradually degrade the remaining hydrocarbons. Cultured microbes may enhance or accelerate the degradation process however the existing microbes can accomplish the same task. Past experience has shown little benefit from adding cultured microbes to soil in an effort to treat soil remaining in-place, below the ground surface; better results have been seen when soil is excavated, mixed, and more uniform distribution of the cultured microbe is feasible. After removal of the majority of contamination and installation of the biovent system to introduce oxygen, hydrocarbon levels should continue to decrease by natural attenuation, or microbial action. Results from the groundwater monitoring program between 1997 and 2001 showed a general decreasing trend in petroleum contaminants, with groundwater eventually reaching drinking water standards. This trend indicates the naturally occurring microbes in the soil are likely using the petroleum as an energy source and degrading, or naturally attenuating the remaining hydrocarbon contaminants.

6. Joe Bereskin asked how the areas to be capped were selected and whether other areas with high levels of petroleum may exist.

   Response: An overview on the sampling was described. Around 200 soil samples were collected and analyzed to determine the extent of contamination, which has been defined pretty well. If it turns out additional contaminants are present that may pose an unacceptable risk, USACE still has responsibility to address it and additional work can be requested in the future.

7. Joe Bereskin also asked about the Reserve-Use Designation and how it would work.

   Response: Such a designation would be made in the ADNR tideland records to note that residual petroleum contamination exists in some of the inter- and sub-tidal marine sediments. It would flag this concern to ADNR staff if or when anyone applies for a permit to conduct activity in the tidelands so ADNR could place any appropriate stipulations or limits on the activity to minimize disturbance of contaminated sediments.

8. A question was raised on whether the state supports the proposed remedy.

   Response: ADEC has been working with USACE and overseeing the project since the early 1990s. The primary source of contamination, the fuel tanks and ~60,000 gallons of fuel product, were removed along with contaminated soil that could practicably be excavated. Contaminated soil remains below the water table and in a band along the shoreline where further excavation could have created erosion problems. The biological sampling and risk assessment work indicate remaining contamination poses little risk and the marine environment is providing good viable habitat. While other cleanup alternatives could be viable, the selected alternative best met the overall remedy selection criteria. Therefore, ADEC supports the selected alternative.

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PART 4: REFERENCES

ADEC (Alaska Department of Environmental Conservation). 2004 (26 May). *Oil and Other Hazardous Substances Pollution Control*. 18 AAC 75.

ADEC. 2002 (7 November). *Guidance on Cleanup Equations and Input Parameters*.

ADEC. 2000 (September). *Guidance for Cleanup of Petroleum Contaminated Sites*.

ADEC. 1997. *Water Quality Standards*. 18 AAC 70.

EPA (U.S. Environmental Protection Agency), Region 10. 1999. *Final Policy on the Use of Institutional Controls at Federal Facilities*.

EPA. 1996 (May). *Soil Screening Guidance: Technical Background Document*. EPA/540/R-95/128.

EPA. 1994. *National Oil and Hazardous Substances Contingency Plan*.

NOAA (National Oceanic and Atmospheric Administration). 1999 (October). *SQuiRT Tables*.

USAED (U.S. Army Engineer District, Alaska). 2003 (March). *Focused Feasibility Study, Akutan Naval Station, Akutan Island, Alaska*. Prepared by Jacobs Engineering Group Inc.

USAED. 2001 (October). *Marine Sediment Remedial Investigation Report, Akutan Island, Alaska*. Prepared by Jacobs Engineering Group Inc.

USAED. 1998 (June). *Remedial Investigation, Interim Removal Action and Risk Assessment, Akutan Naval Station, Akutan Island, Alaska*. Final. Prepared by Jacobs Engineering Group Inc.

(intentionally blank)