THE U.S. NAVY AND THE ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION announce the

PROPOSED PLAN FOR NMCB BUILDING T-1416 EXPANDED AREA

Former Adak Naval Complex, Adak Island, Alaska **August 2005**

INTRODUCTION

(Technical terms used in this plan are italicized where they are first used and defined in the Glossary section at the end of the plan.)

This *Proposed Plan* proposes the preferred cleanup alternative for the Naval Mobile Construction Battalion (NMCB) Building T-1416 Expanded Area (hereafter referred to as the NMCB Building Expanded Area) at the former Adak Naval Complex, Adak Island, Alaska. This Proposed Plan was developed in accordance with State of Alaska regulations governing petroleum-release sites, the Alaska Department of Environmental Conservation (DEC) Oil and Other Hazardous Substances Pollution Control Regulations (18 Alaska Administrative Code [AAC] 75). This document is being issued by the Navy, the lead agency for site activities, and the Alaska DEC, the lead regulatory agency. This document summarizes information that can be found in greater detail in the Final Focused Feasibility Study Report for the NMCB Building Expanded Area and other relevant documents referenced in this Proposed Plan. The Navy and the Alaska DEC encourage the public to review the Final Focused Feasibility Study Report and other relevant documents to increase their understanding of the site and the activities that have been conducted there. The Final Focused Feasibility Study Report and other relevant documents cited in this Proposed Plan are available in the information repositories listed on the side bar of this page.

The public is encouraged to review and comment on this Proposed Plan. The Navy, in consultation with the Alaska DEC, may modify any of the cleanup alternatives, including the preferred cleanup alternative, based on public comments or new information. Following consideration of public comments, the final decision for the NMCB Building Expanded Area will be presented in a *Decision Document* (DD). The DD will include a responsiveness summary describing how public comments were addressed.

The Proposed Plan has the following purposes:

- Provide basic background information
- Describe the cleanup options that were evaluated
- Identify the preferred cleanup alternative for remedial action
- Explain the reasons for recommending the preferred cleanup alternative
- Solicit public review of and comment on all the cleanup alternatives
- Provide information on how the public can be involved in the remedy selection process

Dates to Remember

PUBLIC COMMENT PERIOD: August 16, 2005 through September 15, 2005

The U.S. Navy and the Alaska Department of Environmental Conservation will accept written comments on the Proposed Plan during the public comment period.

For more information, see the information repositories at the following locations:

Bob Reeve High School
Adak, AK 99546

Library Reserve Room
University of Alaska, Anchorage
3211 Providence Drive
Anchorage, AK 99501
(907) 786-1871

Naval Facilities Engineering
Command Northwest
19917 Seventh Avenue NE
Poulsbo, WA 98370-7570

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SITE BACKGROUND

The former Adak Naval Complex is located on Adak Island, which is approximately 1,200 air miles southwest of Anchorage, Alaska, in the Aleutian Island chain (Figure 1). Figure 2 shows the location of the NMCB Building Expanded Area on Adak Island. The former U.S. Navy base occupied 76,800 acres on the northern half of the island. The U.S. Fish and Wildlife Service manages the southern portion of the island, which is a designated wilderness area within the Alaska Maritime National Wildlife Refuge System.

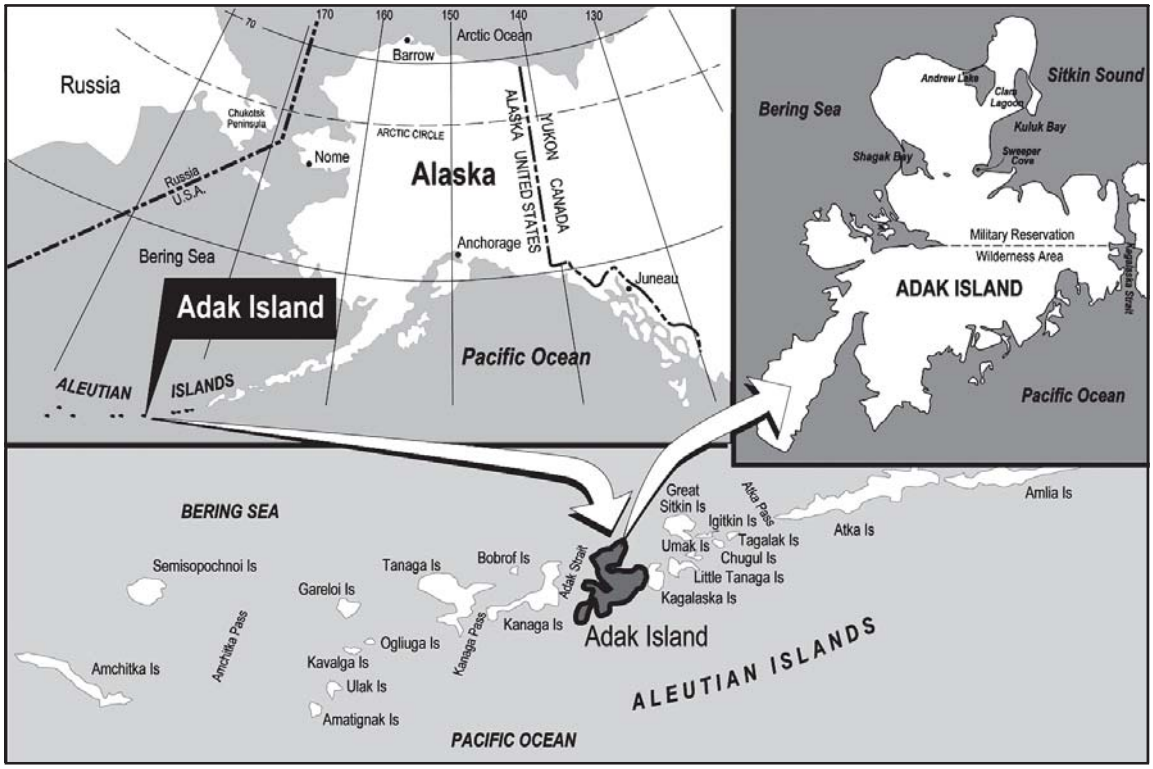

Figure 1
Adak Island and Vicinity

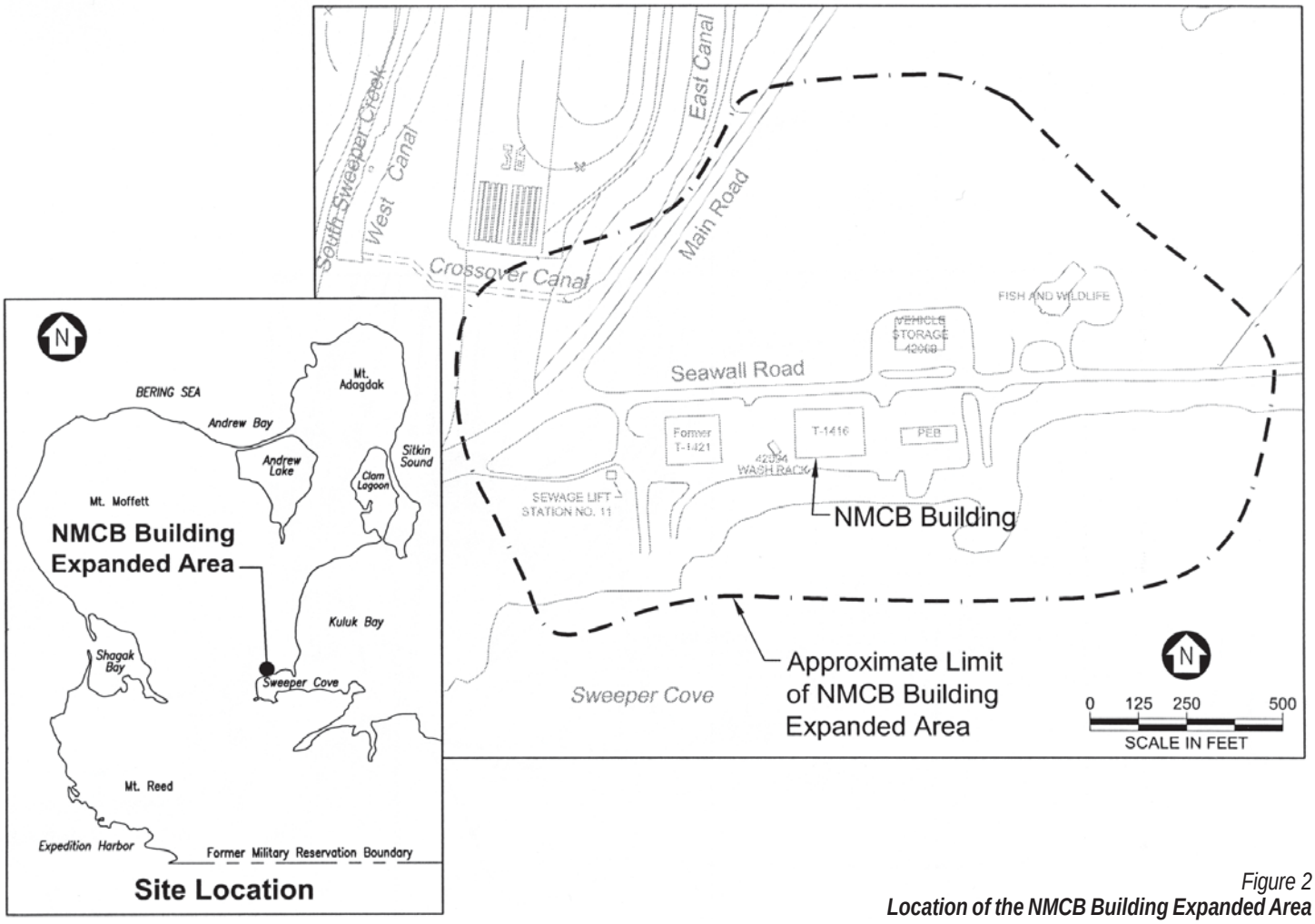

Figure 2
Location of the NMCB Building Expanded Area

All Navy operations ceased at the former Adak Naval Complex on March 31, 1997, when the active Navy mission ended. From April 1997 through September 2000, critical facilities such as the power plant, airfield, and environmental cleanup systems were operated by the Navy through a caretaker contractor. In June 1998, the Navy leased the downtown area and facilities to the Adak Reuse Corporation (ARC). In October 2000, ARC began operation of community facilities such as the airfield and utility systems.

In September 2000, the federal government entered into a *land transfer agreement* with The Aleut Corporation, an Alaska Native corporation. This agreement set forth the terms and conditions for the conveyance of approximately 47,000 acres of the former Adak Naval Complex property to The Aleut Corporation. The actual conveyance or transfer of property occurred on March 17, 2004. The land transfer includes all of the downtown area, housing units, and industrial facilities. The transferred land has *institutional controls* currently in place that limit exposure to petroleum-related chemicals. The institutional controls include notification of intrusive soil excavation activities and groundwater restrictions that prohibit use of the downtown *aquifer* as a drinking water resource. In addition, land use restrictions that prohibit residential use of land are applicable to specific sites on Adak, including the NMCB Building Expanded Area. The Aleut Corporation currently owns the NMCB Building Expanded Area.

The Navy established a community involvement program in 1994 to provide Adak residents and other interested Alaska citizens with timely and updated information on the environmental cleanup and the transfer and reuse of Navy land and facilities. The community involvement program also provides a mechanism for public input on environmental cleanup decisions. Information is conveyed to the public via fact sheets and newsletters; Restoration Advisory Board (RAB) meetings and other formal public meetings; a web site (www.adakupdate.com); information repositories on Adak Island (Bob Reeve High School building, second floor) and in Anchorage (University of Alaska library's reserve room); and the *Administrative Record* file located at Naval Facilities Engineering Command Northwest, Poulsbo, Washington. In addition, a mailing list is maintained and updated to send newsletters, fact sheets, and announcements of upcoming meetings and significant activities, such as public comment periods, to concerned citizens. Public input is obtained through RAB meetings and other formal public meetings, community interviews, requests for public comments, and a telephone hotline.

Various environmental field investigations were performed by the Navy at the NMCB Building Expanded Area between 1990 and 2003, as indicated in Table 1. Results of these investigations indicated that petroleum-related chemicals and some *volatile organic compounds* were present in samples of subsurface soil, groundwater, sediment, and surface water collected from several locations at the NMCB Building Expanded Area.

Table 1. Summary of Environmental Field Investigations, NMCB Building Expanded Area

Date	Investigation Activity
1990	Reconnaissance investigation to evaluate the source of the petroleum hydrocarbons discovered during pipeline installation activities near Runway 18-36
1992	Investigation to evaluate possible petroleum releases associated with the Main Road Pipeline
1993	Investigation to evaluate possible petroleum releases associated with Tank Farm A
1993	Site assessment to evaluate site conditions during the removal of UST T-1416-A from the site
1995	Site assessment to evaluate site conditions during the removal of UST 42484 from Sewage Lift Station No. 11, located at the western margin of the site
1995	Assessment of decommissioned fuel transfer pipelines that traverse the site
1996	Preparation of a summary of site conditions
1998	Site investigation to evaluate the extent of petroleum-related chemicals at the site
1999	Preparation of a site summary report to present all site data collected to that point
2001-2002	Supplemental site assessment to address data gaps
2003	Supplemental sediment investigation to provide current data on sediment impacts

Note:
UST - underground storage tank

Potential sources of the petroleum *hydrocarbons* present at the site are identified on Figure 3. An abandoned 6-inch diameter jet petroleum (JP)-5 fuel line located near the southeast corner of Runway 18-36 uncovered during September 1990 was reported to be the source of a subsurface fuel release. Several additional sources of potential releases are present at the site. These sources include two abandoned 8-inch diameter fuel transfer pipelines, an abandoned 12-inch diameter fuel transfer pipeline, a former used-oil collection underground storage tank (UST) (T-1416-A), an oil-water separator, and former UST 42484-A. Solvent *contamination* observed at the site is likely the result of past practices that caused surface spillage during ship or vehicle maintenance, woodworking, or machine shop activities.

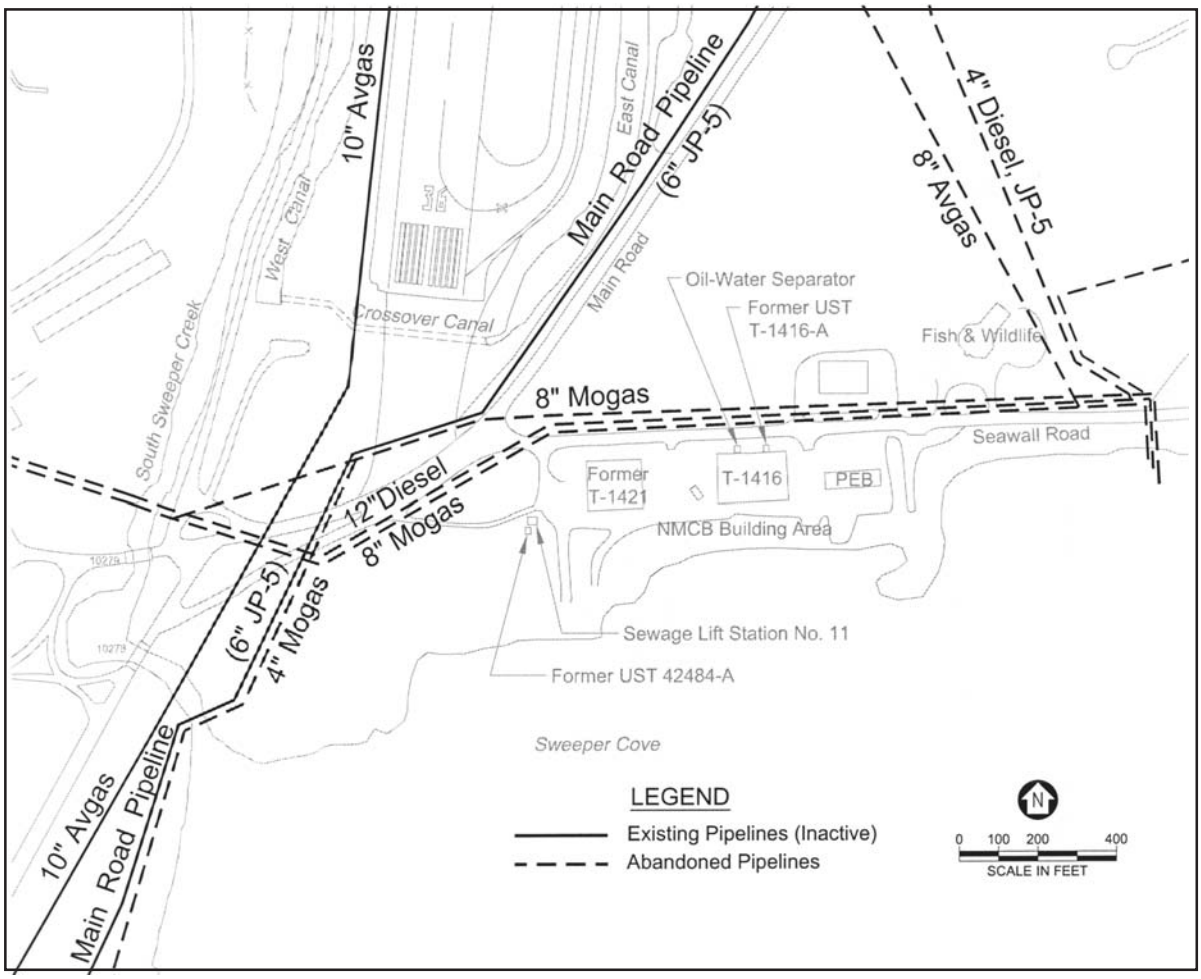

Figure 3
Potential Petroleum Sources at the NMCB Building Expanded Area

Cleanup activities that have been implemented at the NMCB Building Expanded Area include UST and associated piping removals; pipeline cleaning and closures; contaminated soil excavation; *free-product* removals; and *natural attenuation* monitoring. A summary of the cleanup activities performed at the site is provided in Table 2. In addition, results of the free-product recovery activities performed at the site are provided in Table 3.

Table 2 Summary of Site Cleanup Activities, NMCB Building Expanded Area

Date	Cleanup Activity
1994	Removal of former UST T-1416-A (450-gallon, used oil UST)
1995	Removal of former UST 42484-A and associated piping (500-gallon, JP-5 UST)
1995	Removal of a valve pit along the pipeline trace north of Seawall Road
1997-2004[a]	Free-product recovery (total of 201 gallons recovered)
1998	Natural attenuation monitoring
2003	Cleaning and closure of the most northerly 8-inch Mogas pipeline north of Seawall Road

[a]Intermittent operation

Notes:
JP - jet petroleum
UST - underground storage tank

Table 3 Free-Product Recovery Data, NMCB Building Expanded Area

Year	Gallons Recovered	Months System Operated
1997	1.2	4
1998	2.7	5
1999	0	0
2000	3.5	3
2001	117	7
2002	72	6
2003	0	0
2004	4.9	5
Total	201	30

REGULATORY HISTORY

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

In 1993 the Navy, EPA, and Alaska DEC signed the FFA, which incorporated the EPA's cleanup process under the *Comprehensive Environmental Response, Compensation, and Liability Act* of 1980 (CERCLA), as amended by the *Superfund Amendments and Reauthorization Act* of 1986 (SARA). The CERCLA exclusion of petroleum as a hazardous substance required that cleanup of petroleum-related chemicals would follow State of Alaska regulations. Therefore, the FFA stated that petroleum-contaminated sites, such as those containing USTs and leaking underground fuel lines, would be evaluated under a separate two-party agreement between the Navy and the State of Alaska. This agreement, the SAERA, was signed in April 1994.

In May 1997, the Navy and Alaska DEC agreed to integrate the cleanup decision process for petroleum sites with the cleanup decision process being conducted for hazardous substance release sites under CERCLA. As a result, the *Record of Decision* (ROD) for *Operable Unit* A (OU A) was prepared for both the petroleum-contaminated sites and the hazardous-substance-release sites and signed by the Navy, the EPA, and the Alaska DEC in 2000.

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

A Proposed Plan and a DD were previously prepared for the 10 sites where the remaining petroleum-related chemicals pose no *risk* to human health or the environment above *target health goals*, provided that institutional controls remain in effect. This Proposed Plan addresses the NMCB Building Expanded Area, which is one of the four sites where petroleum-related chemicals pose a potential risk to human health or the environment above target health goals. The remaining three sites where petroleum-related chemicals pose a potential risk will be addressed in separate documents.

SITE CHARACTERISTICS

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

The area occupied by the NMCB Building Expanded Area was formerly part of Sweeper Cove. Most of the site south of Seawall Road is underlain by fill material, which was placed as the original shoreline was extended outward and straightened during construction at the site. Subsurface soils beneath the fill material are unconsolidated sand and sandy silt. The subsurface materials have variable *permeability*, and the *saturated* subsurface has a high water-bearing capacity. The Sweeper Cove shoreline is sandy near the discharge area for South Sweeper Creek, but lined with riprap and boulders along the rest of its northern and western shoreline, including along the NMCB Building Expanded Area.

Groundwater is found as a regional aquifer beneath the site. The water table is approximately 4 to 15 feet below ground surface (ft bgs). Groundwater flow beneath the site is complex due to tidal influences and the pumping of water from the airport ditches into South Sweeper Creek. Groundwater surface elevations showed a range of fluctuation as high as 7.2 ft bgs due to tidal influences. Groundwater, in the area occupied by the site, typically flows in two directions. In most areas of the site, groundwater flow is toward Sweeper Cove (see Figure 2). However, flow in the northwestern portion of the site is to the northwest and is largely controlled by the water level in the East Canal. Water in the East Canal flows through the Crossover Canal and into the West Canal (where it is transferred through turbine pumps into South Sweeper Creek). Because groundwater flows in two directions, East Canal, South Sweeper Creek, and Sweeper Cove are all considered to be *downgradient* surface water bodies to the NMCB Building Expanded Area.

Land Use

The site and surrounding area were used primarily for industrial purposes up to the military drawdown at Adak in the late 1990s. Three buildings were constructed in the area in the early 1940s, of which only Building T-1416 still remains at the site. The pre-engineered building (PEB), located east of Building T-1416, was constructed during 1994. The buildings and surrounding land were used as a woodworking shop, supply depot, machine shop, vehicle motor pool maintenance facility, equipment storage area, and vehicle parking area. Five docks, formerly located at the southern margin of the site, were constructed prior to 1945 and were associated with site operations. The Fish and Wildlife Building, located north of Seawall Road from NMCB, houses the administrative functions of the U.S. Fish and Wildlife Service.

Future land use at the NMCB Building Expanded Area is designated for one of three reuses (Figure 4). The largest portion of the site is designated for commercial reuse. The portion of the site northwest of the Main Road is classified for aviation reuse. The western portion of the site between the Main Road and Sweeper Cove, as well as the portion of the site containing the Fish and Wildlife building, are designated for public facilities' reuse.

Groundwater Use

According to Alaska regulations (18 AAC 65.350), groundwater is considered to be a drinking water source unless it can be demonstrated that the groundwater is not currently being used as a drinking water source and groundwater is not a reasonably expected potential future source of drinking water. Groundwater has not historically been used as a drinking water source on Adak Island, nor is it currently being used as such. Future human use of groundwater on Adak Island as a drinking water source is not expected because of the following:

- Surface water from Lake Bonnie Rose is used as the sole drinking water source on Adak Island.
- The *Interim Conveyance document* issued by the United States to The Aleut Corporation imposes institutional controls that prohibit the future use of the downtown groundwater aquifer as a drinking water source.

Institutional controls, as described in the Institutional Controls Management Plan for Adak Island, are currently in place to prevent the use of the downtown aquifer as a future drinking water resource. These institutional controls include a

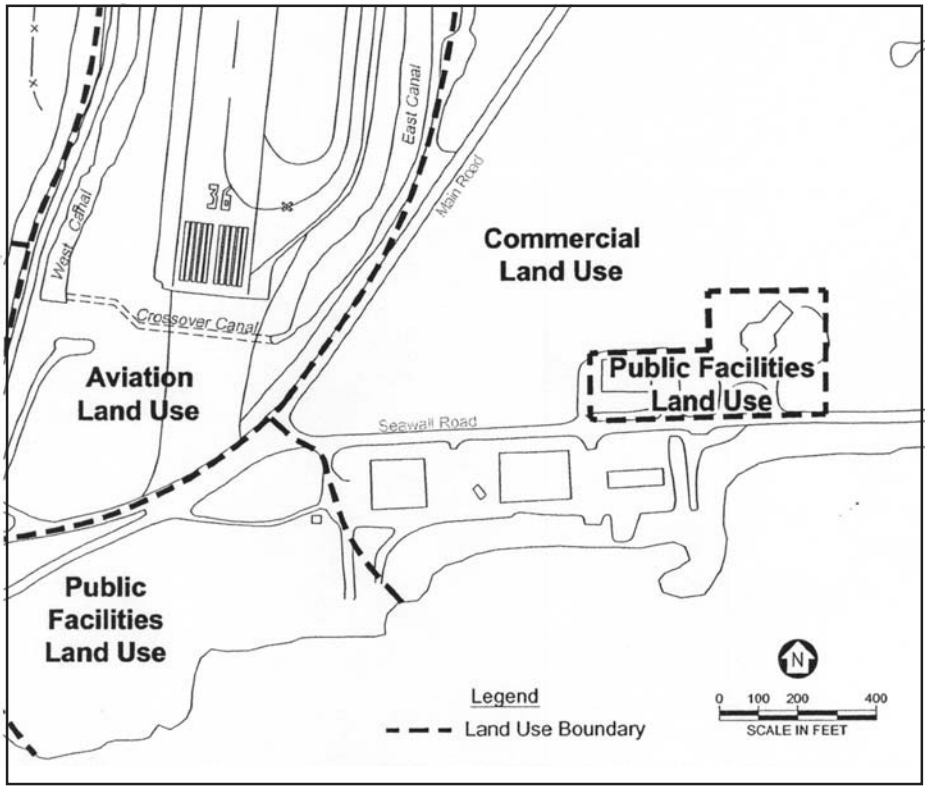

Figure 4
Proposed Future Land Use, NMCB Building Expanded Area

prohibition of well drilling and excavation for the purpose of installing a private or public domestic use well and a requirement for excavation notification. The downtown area will be periodically inspected by driving existing roads to see if there is evidence of domestic wells in use. If there is evidence of domestic use of the groundwater, the Navy will notify the regulatory agencies. Although institutional controls are in place preventing the use of the downtown aquifer, groundwater is still considered a potential future source of drinking water according to the Alaska DEC if potable water could be obtained from a well installed at the site. However, since saltwater was shown to intrude into nearshore groundwater in the vicinity of the NMCB Building Expanded Area in the Saltwater Intrusion Investigation Report, groundwater is not considered a reasonably expected potential future drinking water source at the site.

CLEANUP LEVELS

Chemical-specific *screening criteria* and cleanup levels for soil and groundwater have been established for petroleum-contaminated sites at the former Adak Naval Complex in accordance with Alaska DEC regulation 18 AAC 75. Screening criteria were used to estimate the potential extent of contamination. Cleanup levels are the specified concentrations for remediation. The soil and groundwater screening criteria and cleanup levels proposed for the NMCB Building Area are provided in Table 4.

The Alaska regulations establish four methods for determining cleanup levels for soil [18 AAC 75.340]. The Alaska DEC Method Two cleanup levels, the most stringent cleanup levels for soil, were established to prevent migration of contaminants from soil to groundwater in the over 40 inches of rainfall zone (18 AAC 75.341, Tables B1 and B2). The Alaska DEC Method Two cleanup levels were used as screening criteria for NMCB to estimate the potential extent of soil impacted by petroleum contamination at the site. *Alternative cleanup levels* (ACLs) are specified for remediation of soil and are based on Alaska DEC Method Four [18 AAC 75.340(a)(4)], which uses site-specific *risk assessments* to establish cleanup levels. Site-specific ACLs were calculated as discussed in the Summary of Site Risks section. The proposed ACLs are established at concentrations such that risks from hazardous substances do not exceed the following target health goals: cumulative carcinogenic risk of 1 in 100,000 and the cumulative non-carcinogenic *hazard index* of 1.0 (18 AAC 75.325(h)). Proposed ACLs are submitted to the Alaska DEC for approval. These ACLs may be designated for an individual site if the Alaska DEC agrees that they are protective of human health, safety, and welfare and of the environment [18 AAC 75.340(f)].

The Alaska regulations establish three methods for determining cleanup levels for groundwater [18 AAC 75.345]. The tabulated groundwater cleanup levels [18 AAC 75.345(b)(1), Table C] were used as screening criteria to estimate the potential extent of groundwater impacted by petroleum contamination at the site. Cleanup levels specified for remediation of groundwater at the NMCB Building Expanded Area are based on 10 times these values because groundwater is not reasonably expected to be a potential future source of drinking water [18 AAC 75.345(b)(2)].

Table 4 Soil and Groundwater Cleanup Levels, NMCB Building Expanded Area

	Soil		Groundwater	
Chemical	Screening Criteria (Method 2)[a] (mg/kg)	ACLs (Method 4)[b] (mg/L)	Screening Criteria (Table C)[a] (mg/kg)	Ten Times Table C[b] (mg/L)
Total Petroleum Hydrocarbons				
DRO	230	31,000	1.5	15
GRO	260	1,700	1.3	13
Volatile Organic Compounds				
Benzene	0.02	NC	0.005	0.05
cis-1,2-dichloroethene	0.2	NC	0.07	0.7
Ethylbenzene	5	NC	0.7	7
Methylene Chloride	0.01	NC	0.005	0.05
Toluene	4.8	NC	1	10
Total Xylenes	69	NC	10	100
Trichloroethene	0.02	NC	0.005	0.05
Semivolatile Organic Compounds				
2-Methylnaphthalene	19	NC	1.5	15
2,4-dinitrotoluene	0.0044	NC	0.00125	0.0125
Benzo(a)pyrene	2.4	NC	0.0002	0.002
Benzo(a)anthracene	5.5	NC	0.001	0.01
Benzo(b)fluoranthene	170	NC	0.001	0.01
Carbazole	2	NC	0.04	0.4
Dibenz(a,h)anthracene	5	NC	0.0001	0.001
Naphthalene	19	NC	0.7	7
Inorganics				
Arsenic	1.8	NC	0.05	0.5
Beryllium	38	NC	0.004	0.04
Cadmium	4.5	NC	0.005	0.05
Chromium	1,000	NC	0.1	1
Lead	1,000	NC	0.015	0.15
Nickel	78	NC	0.1	1

[a]Used as screening criteria to determine potential extent of contamination
[b]Used as cleanup levels for remediation

Notes:

ACL - alternative cleanup level
DRO - diesel-range organics
GRO - gasoline-range organics
mg/kg - milligrams per kilogram
mg/L - milligram per liter
NC - not calculated, risk less than target health goal

For surface water, Alaska regulation 18 AAC 70 establishes water use classes and subclasses for the water bodies of the state. Waters of Sweeper Cove and the lower reach of South Sweeper Creek fall within the marine water class and the following subclasses: water supply aquaculture; secondary recreation; and growth and propagation of fish, shellfish, other aquatic life, and wildlife. The water quality standards established for this use class (and these subclasses) specify that *total aqueous hydrocarbons* (TAqH) in the water column may not exceed 15 micrograms per liter (µg/L) and that *total aromatic hydrocarbons* (TAH) in the water column may not exceed 10 µg/L. In addition, there may be no concentrations of petroleum hydrocarbons, animal fats, or vegetable oils in shoreline or bottom sediments that cause deleterious effects to aquatic life. Surface waters and adjoining shorelines must be virtually free from floating oil, film, sheen, or discoloration [18AAC70.020(b)(17)(A)(i), 18AAC70.020(b)(17)(B)(ii), and 18AAC70.020(b)(17)(C)].

The canals of the airport ditch system, including the East Canal, fall within the fresh water class, and the secondary recreation subclass. The water quality standards established for this use class and subclass specify that petroleum hydrocarbons, oils and grease may not cause a film, sheen, or discoloration on the surface or floor of the water body or adjoining shorelines, and surface waters must be virtually free from floating oils [18AAC70.020(b)(5)(B)(ii)].

Alaska State Regulations do not establish cleanup levels for sediment. Therefore, sediment cleanup levels are established based on the results of the ecological risk assessment. Since no ecological risks above target health goals were found in sediment, no cleanup levels are necessary for sediment. The results of the ecological risk assessment are discussed in the Summary of Site Risks section.

EXTENT OF CONTAMINATION

Various environmental field investigations were performed at the NMCB Building Expanded Area between 1990 and 2003. Based upon the results of these field investigations, the potential extent of contamination was estimated for free product, soil, groundwater, surface water, and sediment. Potential extents of contamination for soil and groundwater were estimated by comparing site concentrations to the screening criteria as discussed in the previous section. More detailed information is provided in the Final Focused Feasibility Study Report for the NMCB Building Expanded Area.

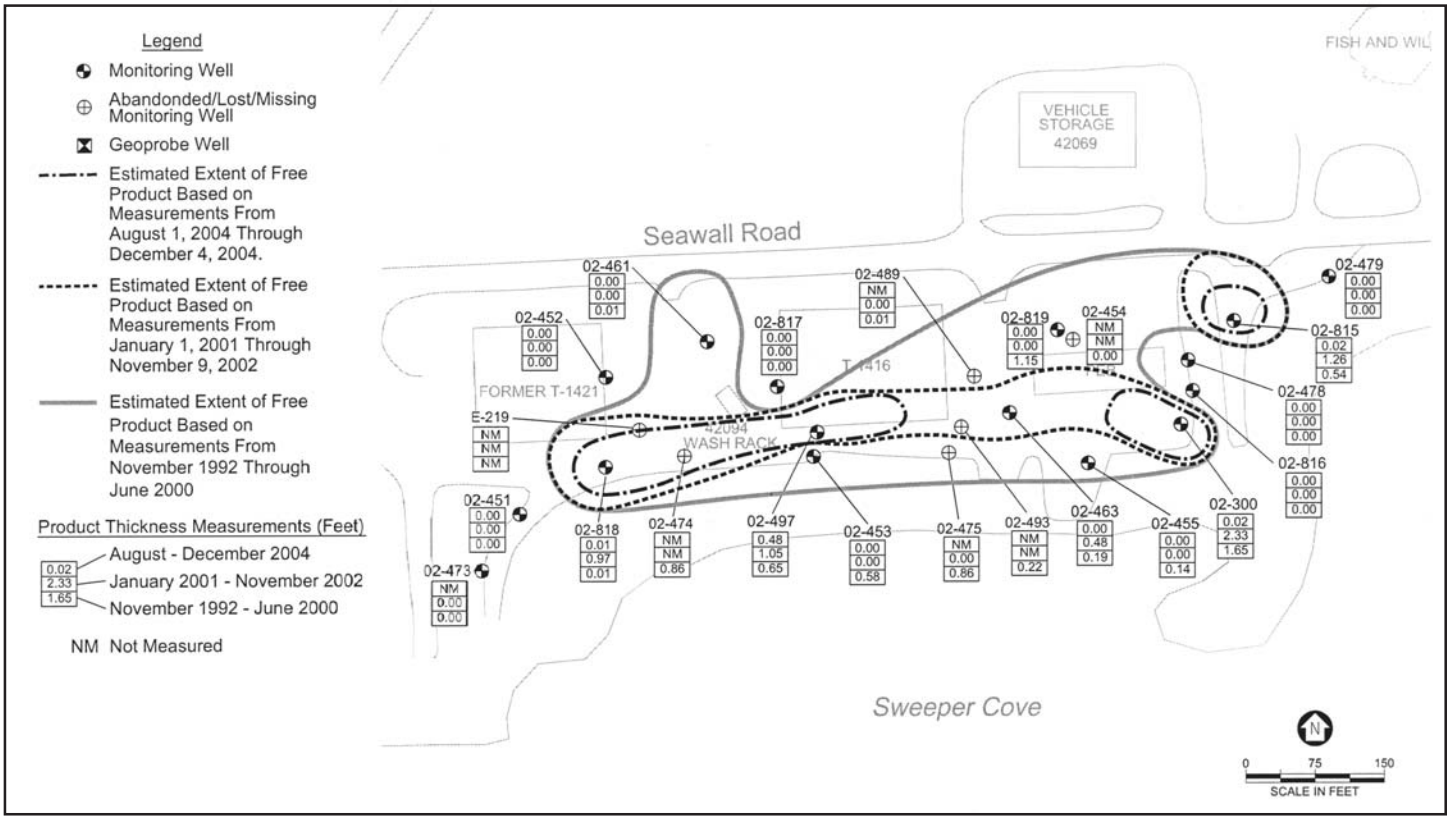

Figure 5
Estimated Extent of Residual Free Product, NMCB Building Expanded Area

Free Product

Between September 1997 and December 2004, monitoring wells within the vicinity of the NMCB Building Expanded Area were gauged periodically for the presence of free product. During this time, free product was detected in 15 of the 50 wells installed at the site. The maximum measured *free-product thickness* reported at the site was 2.33 feet, in well 02300 on May 11, 2002. Figure 5 shows the estimated extent of residual free product at the site based on the maximum measured free-product thickness reported in each well during the three monitoring periods: November 1992 through June 2000, January 2001 through November 2002, and August through December 2004. The maximum estimated extent of free product occurred during the initial monitoring period (November 1992 through June 2000), and the minimum estimated extent of free product occurred during the last monitoring period (August through December 2004).

Soil and Groundwater

The extent of soil and groundwater impacted by petroleum contamination at the NMCB Building Expanded Area was estimated by comparing analytical results to the screening criteria as discussed in the Cleanup Levels section. For soil, the following chemicals were detected above the screening criteria (see Table 5):

- *diesel-range organics* (DRO)
- *gasoline-range organics* (GRO)
- benzene
- ethylbenzene
- methylene chloride
- toluene
- total xylenes
- 2-methynaphthalene
- benzo(a)pyrene
- benzo(a)anthracene
- carbazole
- dibenz(a,h)anthracene
- naphthalene

For groundwater, both the maximum detected analytical result and the most recent analytical result available for each chemical at each location was compared to the screening criteria to determine the extent of groundwater contamination. The most recent analytical results represent the current conditions at the site. For groundwater, the following chemicals were detected above the screening criteria (see Table 5) when using all site data:

- DRO
- GRO
- benzene
- cis-1,2-dichloroethene
- ethylbenzene
- methylene chloride
- toluene
- trichloroethene
- 2,4-dinitrotoluene
- carbazole
- naphthalene
- total arsenic
- total beryllium
- total cadmium
- total chromium
- total and dissolved lead
- total nickel

Table 5 Chemicals Detected in Soil and Groundwater at Concentrations Greater than Alaska DEC Screening Criteria, NMCB Building Expanded Area

Chemical	Maximum Soil Concentration (mg/kg)	Screening Criteria (Alaska DEC Method 2) (mg/kg)	Maximum Groundwater Concentration (mg/L)	Maximum Groundwater Concentration during Most Recent Sampling Event (mg/L)	Screening Criteria (Alaska DEC Table C) (mg/L)
Total Petroleum Hydrocarbons					
DRO	***43,000***	230	***44.5***	***44.5***	1.5
GRO	***27,000***	260	***33***	***17.2 J***	1.3
Volatile Organic Compounds					
Benzene	***80***	0.02	***0.36***	***0.36***	0.005
cis-1,2-dichloroethene	ND	0.2	***0.4***	0.0341	0.07
Ethylbenzene	***180***	5	***1.1 J***	0.45 J	0.7
Methylene Chloride	***2.09 J***	0.01	***0.008 J***	***0.008 J***	0.005
Toluene	***120***	4.8	***1.6***	0.89 J	1
Total Xylenes	***920***	69	5	3.3 J	10
Trichloroethene	ND	0.02	***0.024***	0.012 J	0.005
Semivolatile Organic Compounds					
2-Methylnaphthalene	***120***	19	0.13	0.13	1.5
2,4-dinitrotoluene	ND	0.0044	***0.013***	ND	0.00125
Benzo(a)pyrene	***40***	2.4	0.00014	0.00014	0.0002
Benzo(a)anthracene	***80***	5.5	0.00042 J	0.00042 J	0.001
Benzo(b)fluoranthene	***43 J***	170	0.0005 J	0.0002 J	0.001
Carbazole	***107 J***	2	***0.16***	***0.16***	0.04
Dibenz(a,h)anthracene	***8***	5	0.00002	0.00002	0.0001
Naphthalene	***280***	19	***1.1***	***1***	0.7
Dissolved Inorganics					
Lead	--	--	***0.25***	***0.25***	0.015
Total Inorganics					
Arsenic	NA	1.8	***0.0846***	***0.0846***	0.05
Beryllium	NA	38	***0.00512***	***0.00512***	0.004
Cadmium	NA	4.5	***0.0065***	***0.0065***	0.005
Chromium	NA	1,000	***0.652***	***0.652***	0.1
Lead	48	1,000	***0.33***	***0.33***	0.015
Nickel	NA	78	***0.225***	***0.225***	0.1

Notes:

Concentrations shown in bolded italics exceed the screening criteria

DEC - Department of Environmental Conservation
DRO - diesel-range organics
GRO - gasoline-range organics
J - estimated concentration
mg/kg - milligrams per kilogram
mg/L - milligram per liter
NA - not analyzed
ND - not detected

If only the most recent groundwater data is compared to the screening criteria, four chemicals (cis-1,2-dichloroethene, ethylbenzene, toluene, and trichloroethene) would be removed from the list above. Concentrations of chemicals in soil and groundwater above the screening criteria may not represent a human or ecological health risk as determined by the risk assessments (see the Summary of Site Risks section below).

Surface Water and Sediment

Petroleum hydrocarbons were detected in surface water samples collected from East Canal and Sweeper Cove. TAH and TAqH concentrations in surface water samples collected from Sweeper Cove in 1998 exceeded surface water quality standards. No sheen has been observed on Sweeper Cove. Petroleum hydrocarbons were detected in freshwater sediments in East Canal, and in marine sediments in Sweeper Cove. The detected petroleum hydrocarbons in marine surface water and marine sediment do not represent a human or ecological health risk as determined by the risk assessments (see the Summary of Site Risks section below).

SUMMARY OF SITE RISKS

A human health risk assessment and an ecological risk assessment were conducted to determine if residual petroleum at the NMCB Building Expanded Area would pose an unacceptable risk to human health or the environment if no cleanup actions were to take place. Risks (human health only) and hazards (human health and ecological) from exposure to petroleum compounds were estimated for each *complete exposure pathway*. More detailed information on the risk assessment is provided in the Final Focused Feasibility Study Report for the NMCB Building Expanded Area.

Human health risks and hazards due to exposure to petroleum compounds in soil and groundwater were estimated for each complete exposure pathway (see Table 6). Human health risks and hazards due to exposure to petroleum compounds in the surface water and sediment of Sweeper Cove were not estimated. Exposure to surface water and sediment is insignificant because access to the shoreline is limited by a large berm and riprap present at the site. Risks and hazards were estimated based on proposed land use (Figure 4) and groundwater not being used as drinking water source because institutional controls prohibit the use of groundwater.

Risks and hazards for construction workers and building workers are presented in Table 6. The cumulative risks and hazards for the construction worker scenario (exposure to both groundwater and soil during construction) for the non-*total petroleum hydrocarbon* (TPH) chemicals were 1×10^{-5} and 1 (for cancer and non-cancer effects), while the TPH chemical non-cancer hazards were 2. Alaska DEC target health goals for cancer chemicals are no more than a 1×10^{-5} chance of developing cancer and target health goals for non-cancer chemicals are a *hazard quotient* (HQ) of 1. Therefore, the risks and hazards for the non-TPH chemicals were equal to, but did not exceed, target health goals. However, the hazards due to the TPH chemicals did exceed the target health goal of 1 for non-cancer chemicals. Health risks for building workers inhaling vapors in indoor air did not exceed Alaska DEC target health goals—with an estimated total non-TPH hazard of 0.03 and TPH hazard of 0.01 for the non-cancer chemicals and cancer risks of 2×10^{-7}. While exposures to free product cannot be quantitatively evaluated in risk assessments, exposures to free product may represent an unacceptable health risk. Significant risks are unlikely due to the small and localized extent of the remaining product.

Because TPH chemicals in soil exceeded target health goals and because there is sufficient free product remaining at the site that could constitute a health risk through direct contact, ACLs were calculated for GRO and DRO in soil as allowed under 18 AAC 75.340. The proposed ACLs are 1,700 mg/kg for GRO and 31,000 mg/kg for DRO. The ACLs for GRO and DRO are protective of the three complete exposure pathways: inhalation, ingestion, and dermal contact. Site-specific cleanup levels for groundwater were not calculated; rather, recent analytical data collected from monitoring wells at the site were compared to the proposed groundwater cleanup levels as discussed in Extent of Contamination section. The proposed groundwater cleanup levels for the NMCB Building Expanded Area are the Alaska DEC cleanup levels established for groundwater not currently used for, or not reasonably expected to be used for drinking water, because the water is not potentially potable (i.e., saltwater intrusion makes the water undrinkable). In addition, institutional controls are currently in place for groundwater, which restrict the use of groundwater as a drinking water source. Figure 6 shows the extent of soil at the site where chemical contaminants are

Table 6 Summary of Human Health Risk Assessment, NMCB Building Expanded Area

Receptor	Affected Medium	Exposure Pathways	Non-TPH Hazards/Risks		TPH Hazards
			Hazard Index	Cancer Risk	Hazard Index
Construction Worker	Soil	Inhalation (ambient air), ingestion, dermal contact	0.6	5×10^{-6}	1
	Groundwater	Inhalation (ambient air), dermal contact	0.4	7×10^{-6}	0.05
	Total	See above	0.9	1×10^{-5}	2
Building Worker	Indoor Air	Inhalation	0.03	2×10^{-7}	0.01

Note:

TPH - total petroleum hydrocarbons

present at detected concentrations greater than ACLs. The extent of groundwater contamination exceeding the proposed groundwater cleanup levels is also depicted in Figure 6.

Ecological hazards due to exposure to petroleum compounds in soil and marine sediment were estimated for terrestrial and aquatic *receptors*, respectively. Concentrations of petroleum compounds in marine surface water were less than *risk-based screening concentrations* (RBSCs). Therefore, hazards were not estimated for surface water. There were no ecological hazards above the target health goal for plants and animals exposed to petroleum compounds in sediment. However, potential ecological hazards do exist for terrestrial wildlife exposed to GRO in surface soil. The HQ for GRO was estimated to be 3.9, which exceeds the Alaska DEC target health goal of 1. The ecological RBSC for soils of 1,840 mg/kg was selected as the cleanup level for GRO. However, the human health ACL for GRO of 1,700 mg/kg is lower. As such, the human health ACL would be expected to be protective of ecological receptors.

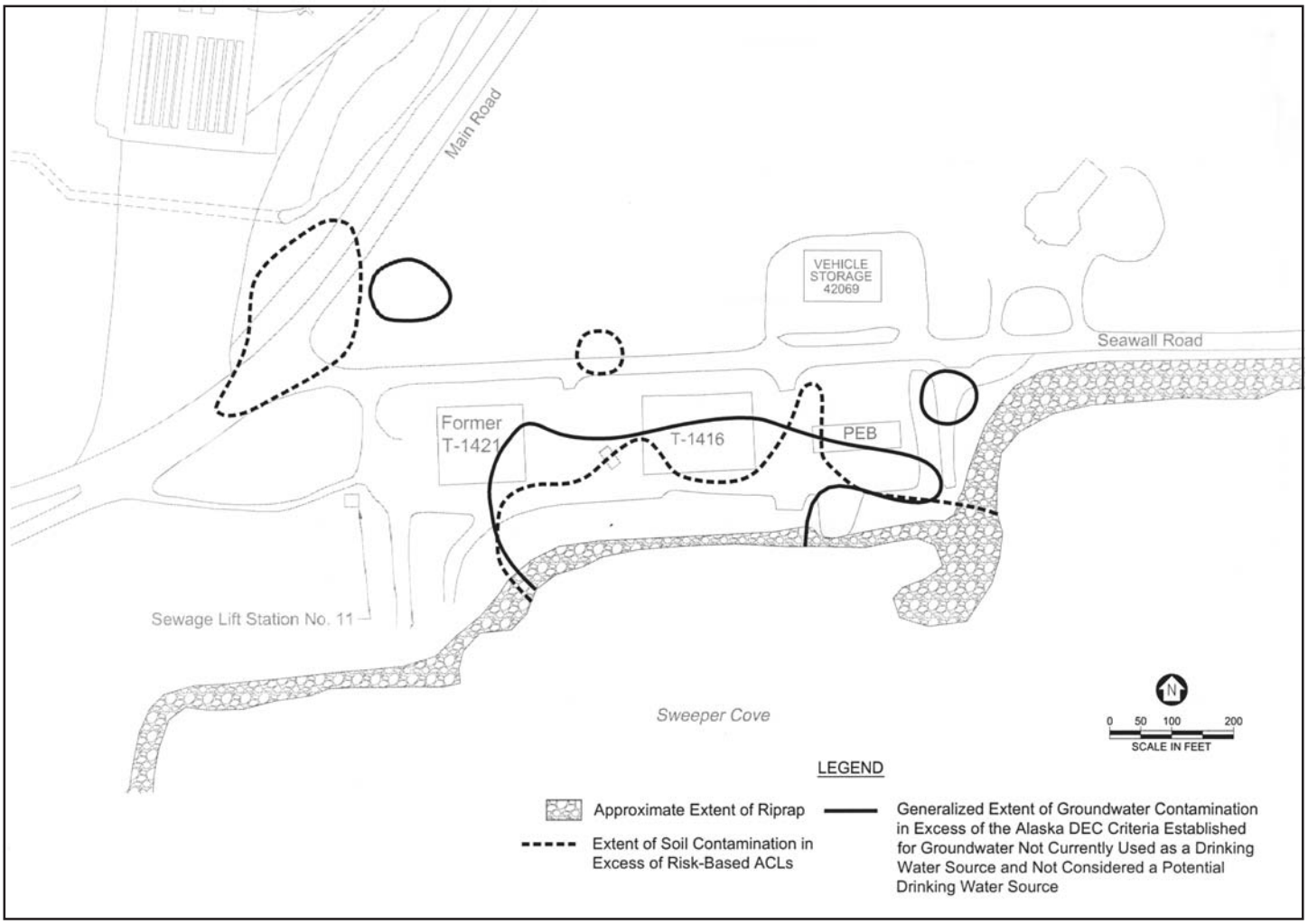

Figure 6
Extent of Soil and Groundwater Contamination, NMCB Building Expanded Area

REMEDIAL ACTION OBJECTIVES

Based on the risk analysis conducted for this site and the regulatory requirements, the following *remedial action objectives* (RAOs) were developed for the protection of human health at the NMCB Building Expanded Area:

- Prevent human exposure to petroleum hydrocarbons in soil that would result in adverse health effects
- Reduce petroleum hydrocarbons in groundwater to concentrations less than or equal to the Alaska DEC groundwater cleanup levels established for groundwater not currently used for, or not reasonably expected to be used for, drinking water.
- Minimize exposure to free-phase petroleum product

The necessity for RAOs to protect ecological receptors was evaluated on the basis of ecological hazards resulting from exposure to petroleum hydrocarbons released at the site. Because the ecological risk based cleanup level for GRO would be greater than the GRO value derived to protect human health, the human health RAO for GRO is protective of ecological receptors. Based on the risk analysis conducted for this site, no ecological RAOs were found to be necessary for the protection of ecological receptors at the NMCB Building Expanded Area.

REMEDIAL ACTION ALTERNATIVES

Cleanup technologies were identified and screened to identify those applicable to the NMCB Building Expanded Area. This screening evaluation was conducted using three criteria identified in Alaska DEC guidance: *protectiveness*, *ability to meet cleanup levels*, and *implementability*. The cleanup technologies that passed the screening were combined to form candidate remedial alternatives for the NMCB Building Expanded Area. These candidate remedial alternatives represent the most effective combination of actions for meeting the RAOs. Brief descriptions of the candidate remedial alternatives, including costs, are as follows:

- **Alternative 1 – No Action**: No action or monitoring would be implemented with this alternative. Institutional controls (equitable servitude restrictions), as described in the Institutional Controls Management Plan, are currently in place for the site. Equitable servitude restrictions applicable to this site include restrictions on land development (i.e., residential land development would be prohibited), the downtown groundwater use prohibition, and the soil excavation notification requirements. This alternative would rely solely on natural attenuation to reduce concentrations of petroleum in the soil and groundwater. However, because monitoring is not included as part of this alternative, there would be no way to verify whether the cleanup levels and RAOs had been achieved. This alternative was retained as the baseline alternative with which the other alternatives were compared.
  Cost: $0
- **Alternative 2 – Institutional Controls, Free-Product Recovery, and *Monitored Natural Attenuation* (MNA)**: This alternative consists of institutional controls that are already in place for soil and groundwater as described in the Institutional Controls Management Plan, installation of three new wells for free-product recovery and groundwater monitoring, free-product recovery from new and existing wells, and MNA for groundwater. Free product would be removed from seven wells (three new and four existing) using passive skimmers, petroleum concentrations in groundwater would be reduced through natural attenuation, and institutional controls would be used to protect human health and the environment as long as groundwater concentrations were greater than groundwater cleanup levels.
  Cost: Capital - $210,000, Annual operation and maintenance (O&M) for recovery - $180,000, Annual O&M for MNA - $80,000, Total Present Worth Cost - $1.9 million
- **Alternative 3—Hot Spot Soil Excavation and MNA**: This alternative consists of excavation of 8,300 cubic yards of soil with the highest concentrations of petroleum hydrocarbons. The excavated soil would be treated using *thermal desorption* to meet soil ACLs, and the treated soil would be replaced in the excavation area. Petroleum concentrations in groundwater would be reduced through MNA; and institutional controls, which are currently in place as described in the Institutional Controls Management Plan, would be used to protect human health and the environment as long as groundwater concentrations were greater than the groundwater cleanup levels.
  Cost: Capital - $8.5 million, Annual O&M for MNA - $76,000, Total Present Worth Cost - $9.5 million
- **Alternative 4—Hot Spot Soil Excavation, *In Situ* Soil Treatment, and MNA**: This alternative consists of excavation and thermal treatment of 8,300 cubic yards of soil with the highest concentrations of petroleum hydrocarbons. In addition, this alternative includes *biological treatment* of soil that exceeds the ACLs in areas outside the excavation areas. Petroleum concentrations in groundwater would be reduced through MNA and institutional controls, which are currently in place as described in the Institutional Controls Management Plan, would be used to protect human health and the environment as long as groundwater concentrations were greater than the groundwater cleanup levels.
  Cost: Capital - $14 million, Annual O&M for in situ treatment - $140,000, Annual O&M for MNA - $76,000, Total Present Worth Cost - $15 million

EVALUATION OF ALTERNATIVES

Each alternative for the NMCB Building Expanded Area was evaluated using four of the five criteria of 18 AAC 751: protectiveness; practicability; short- and long-term effectiveness; and regulations. These criteria are summarized in Table 7. Public input as a criterion will be evaluated after receipt of the public comments on this proposed plan and will be presented in the DD. Each remedial alternative was assessed and assigned a rating of poor, fair, good, excellent, or superior for each evaluation criteria as presented in Table 8. Based on the evaluation of the individual criteria, each alternative was also given an overall rating (poor, fair, good, excellent, or superior).

Alternative 2 was given an overall rating of good, because it provides superior implementability, excellent short-term effectiveness, and good protectiveness and long-term effectiveness at a relatively low cost. Because residual risks remain at the site after active cleanup (free-product recovery), this alternative only obtained a rating of good for long-term effectiveness. However, this alternative minimizes short-term risks and therefore obtained an excellent rating for short-term effectiveness. Although it was rated fair for time to achieve cleanup goals and for regulations because it would take a long time to achieve cleanup goals, Alternative 2 is protective of human health during the period of time required to achieve the cleanup goals (given the implementation of institutional controls and groundwater monitoring). However, it may not be protective of the environment during this period of time.

Table 7 Alaska DEC Criteria for Evaluating Remedial Alternatives

Criteria	Description
Protectiveness	Whether the remedial alternatives protect human health and the environment both during and after the cleanup actions by eliminating, reducing, or controlling exposures to hazardous substances or contaminants and by protecting human health from physical and other hazards directly associated with the cleanup action
Practicable	Whether the remedial alternatives can be designed, constructed, and implemented in a reliable and cost-effective manner. For ease of evaluation, this criterion is subdivided into two separate criteria; implementability and cost.
Short- and long-term protectiveness	Ability of the alternatives to protect human health and the environment during the construction/implementation phase (short-term) and after completion of the cleanup (long-term). The speed with which the alternatives achieve the cleanup goals is also evaluated. For ease of evaluation, this criterion is subdivided into three separate criteria; short-term effectiveness, time to achieve cleanup goals, and long-term effectiveness.
Regulations	Ability of alternatives to attain federal and state applicable or relevant and appropriate requirements or to provide justification for invoking a waiver.
Public input	Whether the public agrees with, opposes, or has no comment on the preferred alternative. Public input will be evaluated after receipt of the public comments on this proposed plan.

Note:
DEC - Department of Environmental Conservation

Alternative 3 was given an overall rating of good, because it provides superior long-term effectiveness and protectiveness, good time to achieve cleanup goals, excellent compliance with regulations, and fair implementability and cost effectiveness. This alternative is capable of achieving the cleanup goals significantly quicker than Alternative 2, and is protective of both human and ecological receptors once soil excavation is complete. However, there are additional short-term risks and costs associated with this alternative when compared to Alternative 2.

Alternative 4 was given an overall rating of fair. This alternative was rated lower than Alternatives 2 and 3 because of the difficulty of implementing this complex alternative, the high cost, and the additional short-term risks associated with this alternative. This alternative received superior ratings for long-term effectiveness and regulations, an excellent rating for protectiveness, and a good rating for time to achieve cleanup goals. Although this alternative provides superior long-term effectiveness, the effectiveness is achieved through additional remedial actions, which have additional short-term risks and costs.

Alternative 1 was given a rating of poor. This alternative received poor ratings for time to achieve cleanup goals, regulations, protectiveness and long-term effectiveness. Although this alternative would be easy to implement and would cost nothing, the alternative would not be protective of human health and the environment.

Table 8 Evaluation of Remedial Alternatives, NMCB Building Expanded Area

	Rating of Alternatives for NMCB Building			
Alaska DEC Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls, Free-Product Recovery, and MNA	Alternative 3 Hot Spot Soil Excavation and MNA	Alternative 4 Hot Spot Soil Excavation In-Situ Soil Treatment and MNA
Protectiveness	○	◒	●	◔
Practicable - Implementability	◔	●	◕	○
Practicable - Cost Effectiveness	●	◔	◕	○
Short- and Long-term Effectiveness Short-term Effectiveness	●	◔	◕	○
Short- and Long-term Effectiveness Time to Achieve Cleanup Goals	○	◕	◒	◒
Short- and Long-term Effectiveness Long-term Effectiveness	○	◒	●	●
Regulations	○	◕	◔	●
Overall	○	◒	◒	◕

Notes:
MNA -monitored natural attenuation

○ Poor ◕ Fair ◒ Good ◔ Excellent ● Superior

PREFERRED CLEANUP ALTERNATIVE

Alternative 2 - Institutional Controls, Free-Product Recovery, and MNA - is the preferred cleanup alternative for the NMCB Building Expanded Area. This alternative will provide an appropriate, cost-effective remedy that protects human health and the environment and that can be implemented at the earliest possible time. The Alaska DEC concurs with the selection of this alternative as the Preferred Alternative.

Alternatives 2 and 3 both received the highest overall rating in the Final Focused Feasibility Study Report. Therefore, only these two alternatives were considered for selection at the NMCB Building Expanded Area. A summary of the issues at the NMCB Building Expanded Area and how Alternatives 2 and 3 address these issues is provided in Table 9. A summary of the advantages and disadvantages of these two alternatives is provided in Table 10.

Table 9 What are the Real Issues at NMCB Building Expanded Area and How Do the Alternatives Address These Issues?

Issue	How is the Issue Addressed?	
	Alternative 2	Alternative 3
Free product[1]	Institutional controls (excavation notification) and passive free-product recovery	Institutional controls (excavation notification) and soil excavation
Unacceptable risks to construction workers	Institutional controls (excavation notification) and natural attenuation	Institutional controls (excavation notification), soil excavation, and natural attenuation
Groundwater concentrations exceed groundwater cleanup levels (10 times Table C values)	Institutional controls (downtown groundwater use prohibition), passive free-product recovery, and monitored natural attenuation	Institutional controls (downtown groundwater use prohibition), soil excavation, and monitored natural attenuation
Unacceptable ecological risks in soil	Passive free-product recovery and natural attenuation	Soil excavation and natural attenuation
Historical marine surface water concentrations exceeded TAH and TAqH water quality standards	Passive free-product recovery and monitored natural attenuation	Soil excavation and monitored natural attenuation

[1]Measurable thicknesses of free product have only been observed on groundwater. Measurable thicknesses of free product and sheen have not been observed on surface water.

Notes:

NMCB - Naval Mobile Construction Battalion
TAH - total aromatic hydrocarbons
TAqH - total aqueous hydrocarbons

Table 10 Summary of Advantages and Disadvantages of Alternatives 2 and 3, NMCB Building Expanded Area

Advantages and Disadvantages	Alternative 2 - Institutional Controls, Free-Product Recovery, and Monitored Natural Attenuation (MNA)	Alternative 3-Hot Spot Soil Excavation and MNA
Advantages	• Future construction worker exposure to contaminated soil and free product unlikely because building foundations not constructed at or below the water table where most of the contamination is located • If construction does occur below water table, effectively controls future construction worker risk through institutional controls • Effectively controls exposure to groundwater through institutional controls • Reduces volume of free product in subsurface through passive free-product recovery • Reduces soil and groundwater concentrations through passive free-product recovery and natural attenuation • Relatively inexpensive • Easy to implement	• Effectively controls remediation construction worker risk through institutional controls • Effectively controls future construction worker risk through institutional controls and soil excavation • Effectively controls exposure to groundwater through institutional controls • Effectively controls risks to ecological receptors through soil excavation • Reduces volume of free product in subsurface through soil excavation • Reduces soil and groundwater concentrations through soil excavation and natural attenuation • TAH and TAqH concentrations in marine surface water reduced through soil excavation and natural attenuation
Disadvantages	• Institutional controls not effective for ecological receptors, therefore risks to ecological receptors may not be effectively controlled in the short-term. However, unacceptable risks ▪ Present at only two locations at depths of 5.5 to 6.5 ft bgs, which is at the lower limits of the biologically active zone ▪ Present only within paved areas in an industrial area with little habitat • Passive free-product recovery and natural attenuation may require time to reduce TAH and TAqH concentrations in surface water to below water quality criteria. However, ▪ No unacceptable ecological risk in marine surface water according to the site-specific risk assessment ▪ No exceedances of Alaska Water Quality Standards or the EPA National Recommended Water Quality Criteria for 2002 for individual chemicals ▪ Surface water samples collected and analyzed for TAH and TAqH in 1998 before most of the free-product recovery activities occurred at the site ▪ Since 1998, BTEX concentrations in groundwater have decreased to between 3% and 57% of the 1998 values indicating surface water concentrations of TAH most likely declining as well, potentially below surface water quality criteria	• Relatively expensive • Relatively difficult to implement for the following reasons: ▪ Soil excavation next to site buildings would require shoring ▪ Soil excavation below the groundwater table complicated by dewatering and shoring requirements ▪ Soil excavation on Adak complicated by the high rainfall ▪ Treatment of water from excavation dewatering (approximately 6,000 gpd) complicated because of the extensive treatment required to meet marine surface water quality criteria ▪ Thermal desorption equipment complicated to operate and requires experienced operators ▪ Thermal desorption also complicated to implement due to the remoteness of Adak Island

Notes:

BTEX - benzene, toluene, ethylbenzene, and total xylenes
EPA - Environmental Protection Agency
TAH - total aromatic hydrocarbons
TAqH - total aqueous hydrocarbons

Alternative 2 is proposed for NMCB Building Expanded Area because the additional costs associated with Alternative 3 are not warranted given that Alternative 2 is protective of human health and the environment. Although risks to ecological receptors may not be effectively controlled in the short-term with Alternative 2 if ecological receptors were exposed to soils at the site, unacceptable risks are present at only two locations within paved areas in an industrial area and the unacceptable risks are present in soil at depths of 5.5 to 6.5 ft bgs, which is at the lower limits of the biologically active zone. Therefore, ecological risks are most likely below target health goals because of a lack of an exposure pathway and potential risks will be reduced with time through passive free-product recovery and natural attenuation. Although TAH and TAqH concentrations were above water quality criteria in 1998, concentrations of petroleum compounds in surface water do not pose any unacceptable risk according to the site-specific ecological risk assessment, which was conducted in accordance with Alaska DEC guidance. In addition, concentrations are likely declining based on declining benzene, toluene, ethylbenzene, and total xylenes (BTEX) concentrations in groundwater and free-product recovery activities that have been implemented at the site since the surface water samples were collected in 1998. If concentrations of TAH and TAqH are not currently below water quality criteria, these concentrations should decline below water quality criteria with the free-product recovery efforts and MNA included as part of Alternative 2. In addition, no sheen has been observed on Sweeper Cove. Finally, Alternative 2 would be much easier to implement than Alternative 3. Alternative 2 would not require water treatment and does not include the complicated thermal desorption system. Therefore, Alternative 2 is the preferred cleanup alternative for the NMCB Building Expanded Area. If Alternative 2 does not appear to be reducing groundwater concentrations to below the groundwater cleanup levels within the 75-year timeframe previously specified in the ROD for OU A, additional remedial activities will be evaluated.

Table 11 Preferred Cleanup Alternative Assessment Activities, NMCB Building Expanded Area

Media	Number of Samples	Analyses	Goals	Potential Impacts
Soil	5	DRO, GRO, BTEX	Verify petroleum compounds not migrating to marine surface water	If sampling indicates migration to surface water, then additional remedial activities will be evaluated
Groundwater	5	DRO, GRO, BTEX, TAH, TAqH		
Surface Water	12	DRO, GRO, BTEX, TAH, TAqH		
Indoor Air	12	VOCs	Verify that contamination below building is not migrating into indoor air at concentrations that result in unacceptable risk	If recalculation of risk including new data shows potential unacceptable risk, then additional remedial activities will be evaluated

Notes:

BTEX - benzene, toluene, ethylbenzene, and total xylenes
DRO - diesel-range organics
GRO - gasoline-range organics
TAH - total aromatic hydrocarbons
TAqH - total aqueous hydrocarbons
VOCs - volatile organic compounds

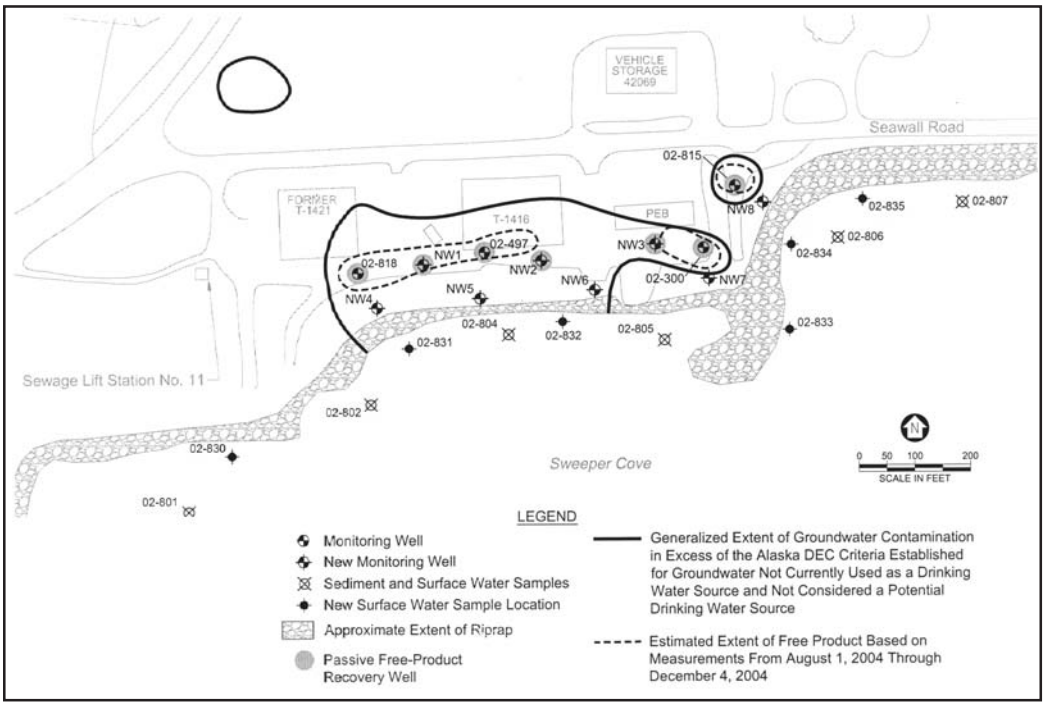

Figure 7
Preferred Cleanup Alternative Activities, NMCB Building Expanded Area

The Navy will perform additional assessment activities to support the selection of the preferred remedial alternative. The additional assessment activities to be performed by the Navy include the collection of additional soil, groundwater, and surface water samples and indoor air samples as summarized in Table 11. Five new monitoring wells will be installed along the shoreline adjacent to the riprap, as shown on Figure 7. Soil samples will be collected during the drilling of these wells, and groundwater samples will be collected after installation of the wells and as part of the annual MNA monitoring. Surface water samples will be collected from six new sampling locations and six existing sampling locations (02-801, 02-802, 02-804, 02-805, 02-806, and 02-807) (see Figure 7). Finally, indoor air samples will be collected in Building T-1416 and in the PEB. Background air samples will also be collected outside of the two buildings.

COMMUNITY PARTICIPATION

The dates of the public comment period and the locations of the information repositories are provided on the front page of this Proposed Plan. Comments from the public will be used by the Navy and the Alaska DEC to help determine what action to take. We invite you to comment on this Proposed Plan. You may submit written comments during the public comment period by sending them to:

Mark Wicklein, P.E.
Naval Facilities Engineering Command Northwest
19917 Seventh Avenue NE
Poulsbo, WA 98370-7570
Phone: (360) 396-0226
Fax: (360) 396-0857
mark.wicklein@navy.mil

After considering public comments, the Navy and the Alaska DEC will select the final cleanup remedies. The preferred cleanup remedy may be modified from the remedy presented in the Proposed Plan based on public comments or new information. The chosen remedy will be described in a DD. The Navy will respond to comments on the Proposed Plan in a responsiveness summary. The responsiveness summary will be part of the DD, which will be available for review in the information repositories at the locations listed on the front page of this plan.

For further information on the NMCB Building Expanded Area, please contact:

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ACRONYMS

AAC	Alaska Administrative Code
ACL	alternative cleanup level
ARC	Adak Reuse Corporation
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DD	Decision Document
DEC	Department of Environmental Conservation
DRO	diesel-range organics
EPA	Environmental Protection Agency
FFA	Federal Facilities Agreement
ft bgs	feet below ground surface
GRO	gasoline-range organics
HQ	hazard quotient
JP	jet petroleum
mg/kg	milligrams per kilogram
µg/L	micrograms per liter
MNA	monitored natural attenuation
NMCB	Naval Mobile Construction Battalion
O&M	operation and maintenance
OU	Operable Unit
PEB	pre-engineered building
RAB	Restoration Advisory Board
RAO	remedial action objective
RBSC	risk-based screening concentration
ROD	Record of Decision
SAERA	State-Adak Environmental Restoration Agreement
SARA	Superfund Amendments and Reauthorization Act
TAH	total aromatic hydrocarbons
TAqH	total aqueous hydrocarbons
TPH	total petroleum hydrocarbons
UST	underground storage tank

GLOSSARY

Ability to meet cleanup levels. This criterion for evaluating potential cleanup technologies considers the effectiveness of technologies in handling the estimated areas or volumes of environmental media (soil, groundwater, and surface water) and in meeting the appropriate cleanup levels and remedial action objectives (RAOs).

Administrative Record. All the documents supporting a government agency's decision. The administrative record contains all documents, data, and descriptions of site-specific actions or observations that are used to make decisions about the site.

Alternative cleanup levels (ACLs). Site-specific cleanup levels established by risk assessment using Alaska DEC Method Four [18 AAC 75.340(a)(4)].

Aquifer. An underground layer of earth, gravel, or porous stone that yields water.

Biological treatment. A method of treatment that uses microorganisms to degrade contaminants using aerobic or anaerobic activity. Aerobic biological activity uses oxygen in the metabolism of food. Anaerobic biological activity does not use oxygen in the metabolism of food.

Complete exposure pathway. A path from the source(s) of a contaminant to humans and other species (animals and plants) via soil, water, or food. A complete exposure pathway consists of the following four elements: (1) a contaminant source and a mechanism of chemical release (e.g., a leaking underground storage tank), (2) an environmental median (e.g., groundwater) that retains or transports the contaminant, (3) a point of potential human/ecological contact with the affected environmental medium, and (4) a means of entry into the body at the contact point. If any of these four elements is missing, the pathway is incomplete and there is no exposure to the chemical.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Also known as Superfund, a federal law authorizing action to respond to the release, or substantial threat of release, into the environment of hazardous substances, pollutants, or contaminants that may present an imminent and substantial danger to public health or welfare. CERCLA's emphasis is on the cleanup of old/inactive hazardous substance sites; it does not include cleanup of spills of petroleum, oil, and lubricants.

Contamination. Any physical, chemical, biological, or radiological substance or matter that is present in soil, groundwater, air, or a combination of these media at a concentration that is greater than regulated levels.

Decision Document (DD). A legal document describing the remedial actions selected for a site by the lead regulatory agency (Alaska DEC).

Diesel-range organics. See the total petroleum hydrocarbons definition.

Downgradient. In the same direction as a stream or other flow, or toward the direction in which the flow is moving.

Federal Facilities Agreement. An agreement between the Navy, EPA, and the Alaska DEC that ensures that the

environmental impacts associated with past and present activities at the facility are thoroughly investigated and that appropriate remedial actions are taken as necessary to protect the public health, welfare, and the environment.

Free-phase petroleum. Petroleum that is present at a site as a separate liquid, which is usually found as a floating layer on groundwater. Does not include petroleum adsorbed onto soil or dissolved in groundwater.

Free product/free-product. See free-phase petroleum definition.

Free-product thickness. A measure of thickness of the floating layer of petroleum on groundwater.

Gasoline-range organics. See the total petroleum hydrocarbons definition.

Hazard index. The sum of hazard quotients.

Hazard quotient. A measure of the non-carcinogenic hazard from exposure to a chemical from a site, which is calculated as the ratio of estimated exposure to a chemical from a site to the estimated safe dose level of that chemical.

Hydrocarbons. A large group of chemical compounds composed of only carbon and hydrogen.

Implementability. This criterion considers the ability to obtain necessary permits for off-site actions; the availability of treatment, storage, and disposal services; and the availability of necessary equipment and skilled workers to implement the technology.

In situ. A method of cleaning up a site without excavating soil or extracting groundwater. Soil and groundwater are treated in place.

Institutional controls. Administrative controls that prevent human exposure to contaminated soils through community education, soil excavation restrictions, groundwater use restrictions, etc.

Interim Conveyance document. Legally binding document that transfers land ownership from one party to another. May include restrictions on certain activities on the transferred land.

Land transfer agreement. An agreement to transfer the land ownership from one party to another. May include restrictions on certain activities on the transferred land.

Monitored natural attenuation. Essentially the same as natural attenuation (see below), but includes a monitoring component such that the reduction in concentrations of contaminants can be verified.

National Priorities List. A federal listing of hazardous waste sites requiring cleanup through the CERCLA program.

Natural attenuation. The process by which the concentration of contaminants in the environment is reduced by natural processes such as volatilization, dispersion, and microbial degradation.

Operable Unit (OU). A separate unit or geographic subarea of a site based on geography, geology, or type of contaminants which is investigated and evaluated separately from other units at the site.

Permeability. A measure of how easily water passes through soil. The greater the permeability, the more easily water moves through soil.

Proposed Plan. A document used to facilitate public involvement in the remedy selection process. The document presents the lead agency's preliminary recommendation concerning how best to address contamination at the site, presents alternatives that were evaluated, and explains the reasons the lead agency recommends the preferred alternative.

Protectiveness. This criterion considers the potential impacts on human health and the environment during the construction and implementation phase and how proven and reliable the process is with respect to site conditions.

Receptor. A person or species evaluated for exposure to a contaminant.

Record of Decision (ROD). A legal document describing the remedial actions selected for a site by the lead regulatory agency (EPA).

Remedial action objectives. The objectives of the remedial action at a contaminated site.

Risk. A measure of the probability that damage to life, health, property, and/or the environment will occur as a result of a given hazard.

Risk assessment. A process for characterizing the current and potential threats to human health and the environment that may be posed by contaminants migrating to groundwater or surface water, being released to air, leaching through soil, remaining in the soil, and bioaccumulating in the food chain. The primary purpose of a risk assessment is to provide risk managers with an understanding of the actual and potential risks to human health and the environ-

ment posed by a site and any uncertainties associated with the assessment. This information may be useful in determining whether there is a current or potential threat to human health or the environment that warrants remedial action.

Risk-based screening concentration. A conservative concentration that meets the target health goals and is protective of ecological receptors. Concentrations greater than RBSCs may result in unacceptable hazards.

Saturated. Void spaces filled with water.

Screening criteria. Criteria used to determine the potential extent of contamination. These criteria may or may not be used as the cleanup levels for remediation of a site.

State-Adak Environmental Restoration Agreement (SAERA). An agreement between the Navy and the Alaska DEC to implement site characterization and remediation of petroleum sites on Adak.

Superfund Amendments and Reauthorization Act of 1986 (SARA). Modifications to CERCLA enacted on October 17, 1986.

Target health goals. Maximum numeric risk levels established by a regulatory agency as allowable risks that do not require further action. When a risk assessment is conducted, the numeric site-specific risk estimates must be equal to or below regulatory target health goals in order for the risk to be considered "acceptable". In Alaska, the target health goal for a carcinogenic compound is 1×10^{-5} (a risk of contracting cancer of 1 in 100,000) and the target health goal for non-cancer chemicals is a hazard quotient or hazard index of one.

Thermal desorption. Treatment technology which utilizes heating to drive off contaminants adsorbed to soil.

Total aqueous hydrocarbons (TAqH). The total concentration of benzene, toluene, ethylbenzene, total xylenes, and polynuclear aromatic hydrocarbons (multi-ring aromatic compounds) in a sample.

Total aromatic hydrocarbons (TAH). The total concentration of benzene, toluene, ethylbenzene, and total xylenes in a sample.

Total petroleum hydrocarbons (TPH). Total petroleum hydrocarbons is a term used to describe a large family of several hundred chemical compounds that originally come from crude oil. Because there are so many different chemicals in crude oil and in other petroleum products, it is not practical to measure each one separately. However, it is useful to measure the total amount of TPH at a site. TPH is a mixture of chemicals, but they are all made mainly from hydrogen and carbon, called hydrocarbons. Scientists divide TPH into groups of petroleum hydrocarbons that act alike in soil or water. These groups are called petroleum hydrocarbon fractions. Each fraction contains many individual chemicals. The grouping of relatively heavier petroleum hydrocarbon chemicals is often referred to as "diesel-range," whereas the grouping of lighter petroleum hydrocarbon chemicals is often referred to as "gasoline-range." These two ranges of petroleum hydrocarbons are typically analyzed separately in the laboratory, using slightly different methods.

Volatile organic compounds. Volatile organic compounds are organic chemicals that easily form vapors at normal temperature and pressure. The term is generally applied to organic solvents, certain paint additives, aerosol spray can propellants, fuels (such as gasoline, and kerosene), petroleum distillates, dry cleaning products and many other industrial and consumer products ranging from office supplies to building materials. Nitrogen (N), oxygen (O), phosphorus (P) and sulfur (S) are also commonly found in organic chemicals.

COMMENT FORM

Your Name:

Your Address:

Your Phone Number:

Comments:

Please mail or fax comments on this Proposed Plan to:

Mark Wicklein, P.E.
Environmental Operations Team, Code 05ER
Naval Facilities Engineering Command Northwest
19917 Seventh Avenue NE
Poulsbo, WA 98370-7570
Fax: (360) 396-0857

If you have special needs or require this document in alternate form, please call Mark Wicklein at (360) 396-0226.

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Attention: Mark Wicklein