US Army Corps of Engineers®

Formerly Used Defense Sites Program

Decision Document

Hazardous, Toxic, and Radioactive Waste (HTRW) Project # F10AK034706
Ham Lake Site, Northway Staging Field
Formerly Used Defense Site (FUDS)
Northway, Alaska

September 2012

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Acronyms and Abbreviations

AAC	Alaska Administrative Code
ACS	Alaska Communications System
ADEC	Alaska Department of Environmental Conservation
ADOT	Alaska Department of Transportation
ARAR	Applicable or relevant and appropriate requirement
AST	Aboveground storage tank
bgs	below ground surface
BLM	Bureau of Land Management
CAA	Civil Aeronautics Administration
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COPC	Contaminants of potential concern
CSM	Conceptual Site Model
DD	Decision Document
DERP	Defense Environmental Restoration Program
DOD	Department of Defense
DRO	Diesel range organics
EPA	United States Environmental Protection Agency
FAA	Federal Aviation Administration
FES	Fairbanks Environmental Services
FFS	Focused Feasibility Study
FT	feet
FUDS	Formerly Used Defense Site
HI	Hazard Index
HLA	Harding Lawson Associates
HTRW	Hazardous, Toxic, or Radioactive Waste
IC	Institutional Controls
JBER	Joint Base Elemendorf Fort Richardson
LTTD	Low temperature thermal desorption
mg/kg	Milligrams per kilogram
mg/L	Milligrams per liter
MNA	Monitored natural attenuation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OIT	Organic Incineration Technology
POL	Petroleum, oil, and lubricants
PP	Proposed Plan

RAO	Remedial action objective
ROE	Right of entry
ROST	Rapid optical screening tool
RRO	Residual range organics
TAH	Total Aromatic Hydrocarbons
TAqH	Total Aqueous Hydrocarbons
ug/L	micrograms per liter
USACE	United States Army Corps of Engineers – Alaska District
USC	United States Code

PART 1: DECLARATION

1.1 SITE NAME AND LOCATION

The Ham Lake Formerly Used Defense Site (FUDS), project number F10AK0347-06, is located in Northway, Alaska approximately 50 miles from Tok, Alaska and 42 miles from the Canadian border. Northway is located in eastern Alaska, approximately 285 air miles northeast of Anchorage and 240 air miles southeast of Fairbanks. The Northway Village is accessible by road from the Alaska Highway at Northway Junction. The current landowner of the Ham Lake FUDS site is the State of Alaska Department of Transportation (ADOT). The Alaska Department of Environmental Conservation (ADEC) tracks details related to the site in their contaminated sites database under file number 170.38.028 (Areas 40/43).

1.2 STATEMENT OF BASIS AND PURPOSE

This Decision Document presents the U.S. Army Corps of Engineers (USACE) selected remedy for the Ham Lake site, chosen in accordance with the Defense Environmental Restoration Program (DERP), the Administrative Record for this site, and based upon the findings of previous investigations. Petroleum, oil, and lubricants (POL) contaminated sites fall under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) petroleum exclusion and are therefore being addressed under the authority of the DERP, United States Code (USC), Title 10, Section 2701. The DERP provides authority to cleanup petroleum contamination when it may pose an imminent and substantial endangerment to public health, welfare or the environment. Alaska's Site Cleanup Rules (18 AAC 75 Article 3 Oil and Other Hazardous Substances Pollution Control) are risk based and indicative of when an imminent and substantial endangerment to the public health or welfare or the environment has been mitigated, and will be the basis for the decision described herein.

Detailed information supporting the selected remedial action is contained in the Administrative Record for this site, located at the U.S. Army Corps of Engineers, Alaska District Office on Join Base Elmendorf-Richardson, Alaska and the Northway Public Library in Northway, Alaska.

1.3 ASSESSMENT OF THE SITE

The response action selected in this Decision Document is necessary to protect the public health and welfare or the environment from the soil and groundwater contamination at the site.

Contaminated Soil – Petroleum contaminated soil remaining at the Ham Lake site is primarily associated with releases from the former fueling station and the fuel storage tanks. Fuel migrated horizontally and vertically through the overburden soil and into the sandy silts until it encountered the shallow groundwater table. Approximately 5,800 cubic yards of soil was excavated in 1998. The excavation surrounded the former above ground storage tank (AST) area and fuel-contaminated soil was removed to groundwater, approximately 6 feet below ground surface. Annual groundwater monitoring began in 1999 for wells located within the Ham Lake area. In 2001, contaminated soil was excavated from the area around the former filling station, along the southern edge of the 1998 excavation. Approximately 780 cubic yards of benzene-contaminated soil was excavated.

Based upon the Rapid Optical Screening Tool (ROST) investigation conducted by the U.S. Army Corps of Engineers (USACE) during 2003 and 2004 (USACE, 2005), the total volume of remaining petroleum contaminated soil exceeding Alaska Department of Environmental Conservation (ADEC) cleanup levels is approximately 5,000 cubic yards. The majority of remaining soil contamination cannot be practically removed as it below the water table or along the shoreline of Ham Lake. Diesel ranges organics (DRO) is the primary contaminant of concern although benzene exceeds ADEC cleanup levels in a relatively small area of the site.

Contaminated Groundwater – A groundwater plume having DRO concentrations exceeding the ADEC cleanup level (1.5 mg/L) is present at the site. The DRO plume exceeding the ADEC cleanup level covers approximately 57,000 square feet.

One well (MW-01B) has historic benzene concentrations exceeding the ADEC cleanup level (0.005 mg/L). The benzene concentration in this well during 2011 was below the cleanup level. Benzene contamination is assumed to be limited to the area immediately surrounding the MW-01B, where the former fueling station was located.

Groundwater monitoring results indicate that natural attenuation of groundwater contamination is occurring and expansion of the contamination plume is not evident. However, natural attenuation rates are relatively low and restoration of groundwater is expected to take many years.

1.4 DESCRIPTION OF THE SELECTED REMEDY

The Selected Remedy for the Ham Lake FUDS addresses the media of concern (soil and groundwater) as identified in previous investigations and comprises the final remedial action for the site. The response action selected in the Decision Document (DD) is necessary to protect the public health, welfare, and the environment from actual or threatened releases of hazardous substances from the site.

The response action selected in this Decision Document is protective of public health, welfare, and the environment. The selected remedy entails the following major components:

- Residual contaminated soil will be left in place.
- Implementation of Institutional Controls (ICs) including a deed notice documenting the location and extent of residual contamination and informing the landowners of the requirement to notify ADEC and obtain approval prior to moving contaminated soil off-site or using, or pumping and discharging, contaminated groundwater.
- Groundwater monitoring will be conducted at three year intervals until cleanup levels are achieved or ADEC approves modifying or eliminating the monitoring. Monitoring will be conducted to verify the plume is stable or decreasing in size and that natural attenuation is occurring.
- Monitoring, IC inspections and reporting (at least every three years) will continue until cleanup levels are met or for 30 years, after which the remedy would be re-evaluated.

- Signs may be posted on the property, if requested by the landowner, stating the requirement to notify ADEC and obtain approval prior to moving contaminated soil off-site or using, or pumping and discharging, contaminated groundwater.

There have been significant contaminated soil excavations and treatment efforts previously completed at the Ham Lake site. Essentially, all contaminated soils above the groundwater table and outside of the limits of Ham Lake have been excavated and treated. The cleanup has been performed to the maximum extent practicable even though residual petroleum-contaminated soil and groundwater exists on-site. These removal actions meet the preference for treatment under CERCLA. The implementation of ICs and continued groundwater monitoring are the follow on to the removal actions to assure protectiveness. The landowner, the Alaska Department of Transportation and Public Facilities (ADOT) has agreed to adopt the institutional controls that are included as part of Selected Remedy.

Institutional Controls

Institutional controls (ICs) will inform land owners, potential lease holders, and the public regarding site contamination hazards. This approach limits potential for risk to the public and the environment from potential exposure to remaining contaminants. Notification to the landowner will include the rationale for this determination as well as a description of the contamination remaining at the site, the spatial location of the contamination (including the coordinate system, datum, and units), the depth and lateral extent of the contamination, the potential health risks associated with the contaminants, and the activities to avoid and prevent exposure. A copy of this notification will be provided to ADEC.

A Notice of Environmental Contamination will be recorded with the State of Alaska Recorder's Office (e.g., deed notice) which documents the areas with residual soil and groundwater contamination, and describes the requirements for managing residual contamination in accordance with 18 AAC 75.325. ADEC approval is required prior to moving contaminated soil off-site and prior to using or pumping and discharging contaminated groundwater.

The ICs will include routine inspection, monitoring and reporting to verify that they are being maintained and are effective. The USACE will submit reports to ADEC at least every three years documenting the groundwater and IC monitoring results. The landowner will also be requested to provide immediate notification to ADEC in the event of planned land use change or any anticipated excavation or groundwater use in the area with residual contamination.

The activities described in this section are intended to comply with 18 AAC 75.375 and shall hereinafter be referred to as "Institutional Controls." Periodic reviews of the ICs and groundwater monitoring data will be coordinated between the landowner, ADEC and USACE. The need for landowner management of residual contamination will be removed if future site investigations are undertaken that determine that natural attenuation processes have reduced contaminant concentrations to below the ADEC Method Two and Table C cleanup levels.

Monitored Natural Attenuation

A second component of the selected remedy is the monitoring of natural attenuation. Contaminant degradation in groundwater will be assessed using MNA. MNA is an approach to document the naturally occurring processes that will reduce groundwater contaminants to acceptable levels within a projected time frame. The natural processes include dilution, volatilization, biodegradation, adsorption, and chemical reactions between contaminants and aquifer materials. Groundwater monitoring will be conducted at three year intervals until cleanup levels are achieved or until ADEC and USACE agree that further groundwater monitoring is no longer necessary.

1.5 STATUTORY DETERMINATIONS

The Department of Defense (DOD) is authorized to carry out a program of environmental restoration at former military sites pursuant to the DERP program (10 USC 2701 et seq). Under that program, FUDS properties are defined as real property that was owned by, leased by, or otherwise possessed by the United States and that was transferred from DOD control prior to 17 October 1986.

DRO, RRO and benzene are the contaminants of concern in soil and/or groundwater at this site. The preparation of this Decision Document is consistent with CERCLA guidance.

The selected remedy is protective of human health and the environment and complies with pertinent risk-based standards for petroleum hydrocarbons. The remedy is cost-effective, and utilizes a permanent solution to the maximum extent practicable.

Authorizing Signature

This Decision Document presents the Selected Remedy of institutional controls and monitored natural attenuation for the contaminated soil and groundwater at Ham Lake FUDS at Northway, Alaska. This Decision Document will be incorporated into the Administrative Record for the Ham Lake FUDS which is available for public review. The U.S. Army Corps of Engineers is the lead agency under the Defense Environmental Restoration Program at the Ham Lake FUDS (#F10AK0347-06), and has developed this Decision Document consistent with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan. This document, presenting a selected remedy with a present worth cost estimate of $271,000, is approved by the undersigned, pursuant to Memorandum, DAIM-ZA, September 9, 2003, Subject: Policies for Staffing and Approving Decision Documents (DDs) and Engineer Regulation 200-3-1, Formerly Used Defense Sites Program Policy.

_____ Date _____

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PART 2: DECISION SUMMARY

This Decision Summary provides an overview of the conditions at the Ham Lake site, project number F10AK0347-06. It summarizes the data from the remedial investigation phase, describes the remedial alternatives considered, and analyzes those alternatives compared to the criteria set forth in the National Contingency Plan (NCP). The Decision Summary explains the rationale for selecting the remedy, and how the remedy satisfies the statutory requirements of the CERCLA, as applicable.

2.1 SITE NAME, LOCATION, AND BRIEF DESCRIPTION

The Ham Lake Formerly Used Defense Site (FUDS) is located in Northway, Alaska approximately 50 miles from Tok, Alaska and 42 miles from the Canadian border. The Northway Village is accessible by road from the Alaska Highway at Northway Junction.

The Ham Lake site is the former location of aboveground storage tanks (ASTs) that were previously part of the U.S. Department of the Army's operations at the Northway Staging Field. The Ham Lake site is adjacent to Northway Road, just north of the Northway Airport. Ham Lake borders the site on the northwest.

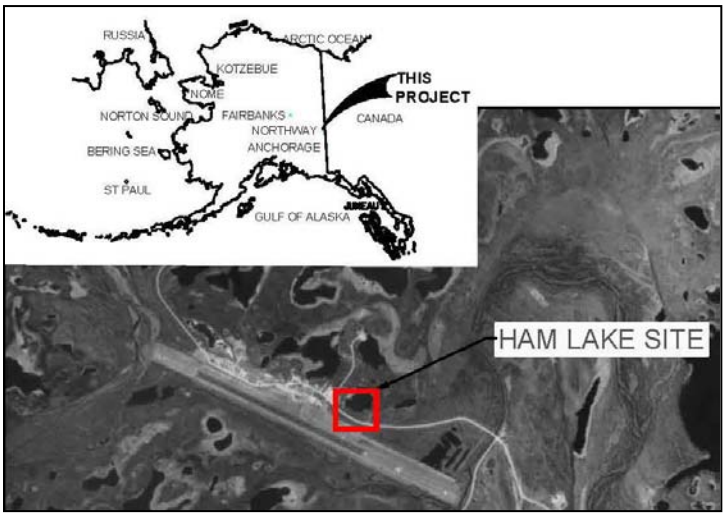


Figure 1. Ham Lake Location Map

2.2 SITE HISTORY

The Northway Staging Field originally consisted of 6,334 acres, which were acquired for use by the Department of the Army from the Bureau of Land Management (BLM) and Civil Aeronautics Administration (CAA). The Ham Lake site consists of two sites, Areas 40 and 43. The Ham Lake site was used as a fueling facility that was part of the Army's operations at the Northway Staging Area. Construction of military facilities at Northway began in 1941 and during the height of operations at Northway, hundreds of buildings were built, including aircraft hangars, warehouses, garages, sawmill, powerhouse, machine shop, and dozens of barracks. In 1966, the Federal Aviation Administration (FAA) transferred the right to use the lands and airport facilities to the State of Alaska.

Currently, the Northway Staging Field site consists of approximately 11.5 square miles in the vicinity of the Northway Airport. Ham Lake is located within the central portion of the Northway Staging Field, approximately 300 feet (ft) east of the Northway Road and Loop Road intersection (Figure 2).

The current landowner is the State of Alaska Department of Transportation (ADOT). To allow access to the site USACE and ADOT have developed a Right of Entry (ROE) that is designated as ROE Agreement ADA-70826.

2.3 INVESTIGATION AND REMEDIAL ACTION HISTORY

The Ham Lake site is located within a flat swampy floodplain that was once a channel of the Nabesna River. Discontinuous permafrost exists throughout the area ranging in thickness from 90 to 150 feet. Groundwater at the Ham Lake site is shallow, typically between three and eight feet deep depending upon the distance from the lake, and is in unfrozen sediments above the permafrost. Ham Lake is located immediately adjacent to the project site and is presumed to have strong influences on groundwater flow in the immediate area.

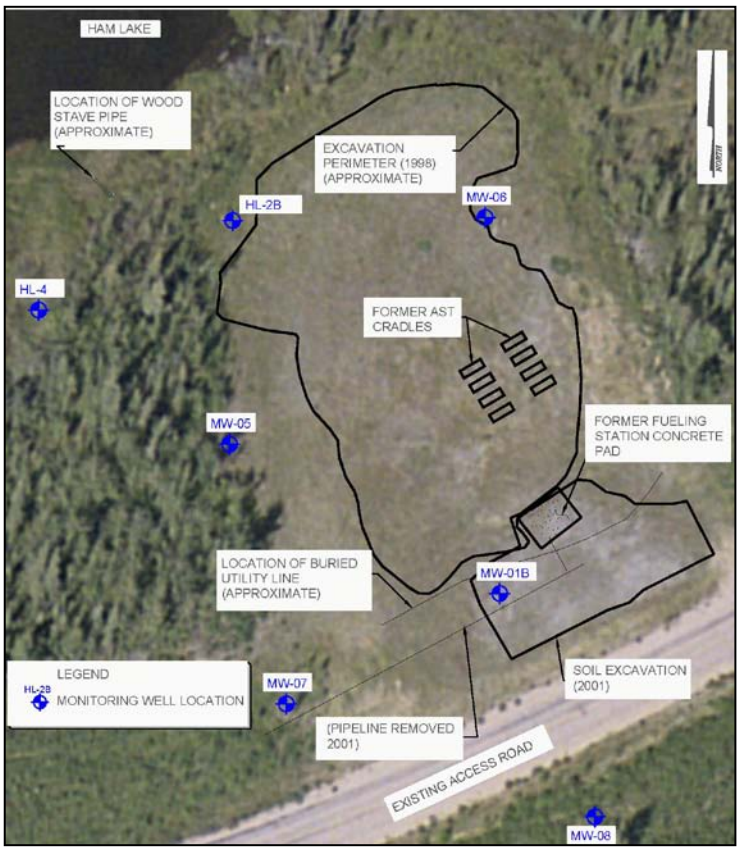


Figure 2. Ham Lake Site Map

2.3.1 Site Investigations

Remedial Investigations (1994 - 1997)

Investigations were conducted in phases during this time period to evaluate the presence of contamination in soil and groundwater in the Ham Lake Area. Debris was inventoried, sediment and surface water samples were collected, and monitoring wells were installed. Soil and soil gas sampling was also conducted around the project site. Fuel related contaminants were detected in all media sampled. Subpermafrost wells, wells that are screened in groundwater below permafrost, provide the principal source of drinking water in the Northway area and range in depth from 90 to 340 feet below ground surface. A 265 foot deep subpermafrost drinking water well is located at the airport, approximately 2,000 feet southwest of the Ham Lake site. This well was sampled in 1994 and did not contain contaminant concentrations that exceeded the ADEC cleanup levels.

Focused Remedial Investigations (1999)

The 1999 RI was conducted to determine the impact of previous excavation activities on the surface water and sediments of Ham Lake, impact to groundwater of DRO and benzene in soil, and extent of DRO and benzene contamination remaining in soil at the site. Fuel components were found in lake sediments and groundwater. It was estimated that approximately 285 cubic yards of DRO contaminated soil and 870 cubic yards of benzene contaminated soil remained at the site following the 1998 removal (See Section 2.3.2).

ROST Investigations (2003 and 2004)

Rapid optical screening tool (ROST) investigations were conducted by the USACE during 2003 and 2004 to further delineate the extent of remaining contamination at the site. The investigations determined that the bulk of the remaining fuel contaminated soil lies within the saturated zone, approximately 6 to 10 feet deep.

Groundwater Monitoring (2006 to Present)

Product recovery was performed at monitoring wells R-1 and HL-2B. Approximately 0.02 gallons of product was recovered from each well during 2006. Product recovery was discontinued in 2007. Groundwater samples have been collected annually since 2006.

2.3.2 Site Removal Activities

Soil Excavations (1998 and 2001)

Approximately 5,800 cubic yards of soil was excavated in 1998. The excavation surrounded the former AST area and fuel-contaminated soil was removed to groundwater, approximately 6 feet below ground surface. In 2001, contaminated soil was excavated from the area around the former filling station, along the southern edge of the 1998 excavation. Approximately 780 cubic yards of benzene-contaminated soil was excavated.

2.3.3 Site Evaluations

Focused Feasibility Study (1997)

A Focused Feasibility Study (FFS) was prepared for the Ham Lake site in 1996 and finalized in July 1997 (Dames & Moore, 1997) to support the development of a Proposed Plan. The FFS used data available from the investigations to evaluate eight remedial alternatives for inclusion in the Proposed Plan. USACE developed site-specific alternative cleanup levels (ACLs) using ADEC guidance that was available at the time (USACE, 1997a). ACLs were calculated for diesel range organics (DRO), residual range organics (RRO), and benzene based on the migration to groundwater pathway. The preliminary remediation goals were categorized as to-be-considered criteria (DRO 4,100 mg/kg, RRO 10,100 mg/kg, and benzene 0.47 mg/kg) because the ADEC regulations had not been fully promulgated.

Proposed Plan (1997)

A Proposed Plan was prepared in 1997 to present the preferred remedial action for contaminated soil at Ham Lake (Area 43) and the nearby Grease Pit (Area 27) (USACE, 1997b). The proposed plan recommended two remedial alternatives; Removal and Off Site Treatment, or Removal and On Site Treatment. The Proposed Plan contained proposed cleanup goals for DRO (3,900 mg/kg), RRO (10,100 mg/kg), and benzene (0.44 mg/kg). The recommended remedial actions were completed during 1998 and 2001. However, soil confirmation results from the 1998 and 2001 excavations indicated DRO remained at concentrations up to 110,000 mg/kg and benzene remained up to 0.84 mg/kg.

Feasibility Study Report (2010)

A Feasibility Study (FS) was prepared to identify and evaluate remedial alternatives for the Ham Lake site, Areas 40 and 43 (FES, 2010). The FS summarized previous site activities, identified

remedial action objectives, evaluated applicable remedial technologies, and analyzed nine alternatives to address remaining soil and groundwater contamination. Since the groundwater at the Ham Lake Site is relatively shallow and is in contact with contaminated soil, remedial alternatives were evaluated based on the most conservative, default migration to groundwater pathway cleanup levels from 18 AAC 75, Tables B1 and B2, for unrestricted land use. The cleanup levels for the migration to groundwater pathway in the under-40-inch precipitation zone are 250 mg/kg for DRO and 11,000 mg/kg for RRO. The migration to groundwater pathway cleanup level for benzene is 0.025 mg/kg.

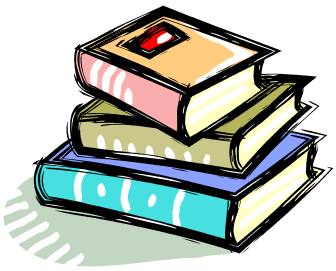
Proposed Plan (2011)

A Proposed Plan was prepared that presented the cleanup alternatives proposed for contaminated soil and groundwater (FES, 2011). The Proposed Plan identified a preferred remedial alternative of institutional controls for soil and groundwater and monitored natural attenuation for groundwater at the site.

Information Repositories

Northway Public Library
Mile 5 Northway Road
Northway, Alaska 99764
Phone: (907) 778-2251

U.S. Army Engineer District, Alaska
PO Box 6898
JBER, Alaska 99506
Phone: (907) 753-2595



2.4 ENFORCEMENT HISTORY

Remedial investigation and removal work at the Ham Lake site has been carried out under the DERP FUDS program. There have been no enforcement activities or notices of violation pertaining to the Department of Defense activities at the Ham Lake site.

2.5 COMMUNITY RELATIONS ACTIVITIES

Public participation has been an important component of the CERCLA process at the Ham Lake site.

A public meeting was conducted to discuss the Ham Lake project status and developments in September 2008. A second public meeting to discuss the Proposed Plan (FES, 2011) was held in Northway in September 2011. Representatives from USACE and the state regulator (ADEC) were in attendance. Public notice of this meeting was announced with flyers posted in community buildings.

The opportunity for public review and commentary on project documents has been made available throughout all phases of the project. Detailed responses to comments are available in the correspondence file at the Information Repositories or in appendices of the final documents. All comments received are documented in the Administrative Record file.

Project documentation, reports, and other materials are available at the public library in the Walter Northway School and the Administrative Record located at the USACE Office on Joint Base Elmendorf-Fort Richardson (JBER).

2.6 SUMMARY OF SITE RISKS

2.6.1 Nature and Extent of Contamination

Soil and groundwater at the Ham Lake site have been impacted by petroleum hydrocarbons. The original evaluation of the nature and extent of contamination was based on data collected from the investigations and removal action beginning in 1994. Analytical results were compared to background concentrations and ADEC cleanup levels (18 AAC 75) to determine chemicals of potential concern (COPCs) for the site. DRO, benzene and residual range organics (RRO) were identified as COPCs at the site.

Previous investigation results indicated that contaminated soil remained along the north end of the excavation following the 1998 removal action. DRO was documented at concentrations up to 110,000 mg/kg. Additional soil excavation was conducted in 2001. Soil confirmation samples indicated residual concentrations of benzene up to 0.84 mg/kg. Additional investigation using the Rapid Optional Screening Tool (ROST) was conducted in 2003 and 2004. The investigation results indentified three main areas of residual soil contamination. Figures 3 and 4 present the extent of contaminated soil and groundwater remaining on site.

Area 1A was not excavated further in 1998 due to the proximity of Ham Lake to the excavation boundary. The DRO-impacted soil in this area is generally found between 2.5 and 6 feet below ground surface (bgs), with an estimated volume of 1,000 cubic yards. The maximum residual DRO concentration in soil, based on the 2005 ROST investigation is 28,300 mg/kg.

Area 1B contains residual DRO-contaminated soils within the saturated zone, approximately 6 to 10 feet bgs, with an estimated volume of 2,800 cubic yards. The maximum residual DRO concentration in soil, based on the 2005 ROST investigation is 6,980 mg/kg.

Area 2 contains residual benzene-contaminated soil near MW-1B, approximately 5 to 7 feet bgs, with an estimated volume of 200 cubic yards. The maximum residual benzene concentration in soil, based on the 2001 removal action confirmation samples is 0.84 mg/kg.

Area 3 contains residual DRO-contaminated soil near MW-07, approximately 1.3 to 7.5 feet bgs, with an estimated volume of 1,000 cubic yards. The maximum residual DRO concentration in soil, based on the 2005 ROST investigation is 7,050 mg/kg.

Table 1. Summary of Residual Soil Contamination

Contaminant	ADEC Method 2 Cleanup Level (mg/kg)	Maximum Detected (mg/kg)
Benzene	0.025	0.84
DRO	250	28,300

The contaminated groundwater plume is relatively well delineated, with the exception of defining the easterly extent of the DRO groundwater plume. Post-removal action groundwater monitoring has been conducted annually since 2006. Four wells (MW-1B, HL-2B, MW-6, and

MW-7) have historically had DRO concentrations exceeding the ADEC cleanup level of 1.5 mg/L, with concentrations up to 20.8 mg/L (HL-2B in 2007). DRO was detected at concentrations ranging from 0.253 to 4.41 mg/L during the September 2011 monitoring event. DRO exceeded the ADEC cleanup level in two (HL-2B and MW-06) of the seven wells sampled in 2011. Both wells have consistently had DRO concentrations above the ADEC cleanup level for five and six sampling events for HL-2B and MW-06, respectively. The easterly extent of the DRO plume which exceeds the ADEC cleanup level is estimated. The DRO plume exceeding 5 mg/L covers approximately 35,000 square feet, as shown on Figure 4.

During the 2011 monitoring event, RRO concentrations ranged from 0.188 to 1.66 mg/L, and exceeded the ADEC cleanup level of 1.1 mg/L in two wells, MW-6 and HL-4. RRO concentrations have exceeded the ADEC cleanup levels in five of the six sampling events in MW-6 and two of the six sampling events in HL-4.

One well (MW-1B) has historic benzene concentrations up to 0.296 mg/L (2006), exceeding the ADEC cleanup level of 0.005 mg/L. Benzene contamination above the cleanup level has only been detected in well MW-1B, where the former fueling station was located. During the September 2011 monitoring event, the benzene concentration in MW-1B was 0.00062 mg/L and has been below the ADEC cleanup level for two consecutive sampling events. Previously, the benzene concentration exceeded the ADEC cleanup level in five consecutive sampling events at this well. Benzene concentrations have not exceeded cleanup goals in any of the other six wells.

No other contaminants (toluene, ethylbenzene, and xylenes) have been detected above ADEC cleanup levels at the site. Free product was observed in groundwater monitoring wells R-1 and HL-2B in 2006. Free product has not been observed since 2007 and product recovery efforts were discontinued (FES, 2007).

Table 2. Summary of Residual Groundwater Contamination

Contaminant	ADEC Table C Cleanup Level (mg/L)	Maximum Detected (2006-2011) (mg/L)	Monitoring Well Location (Year)
Benzene	0.005	0.296	MW-1B (2006)
DRO	1.5	20.8	HL-2B (2007)
RRO	1.1	5.87	HL-2B (2007)

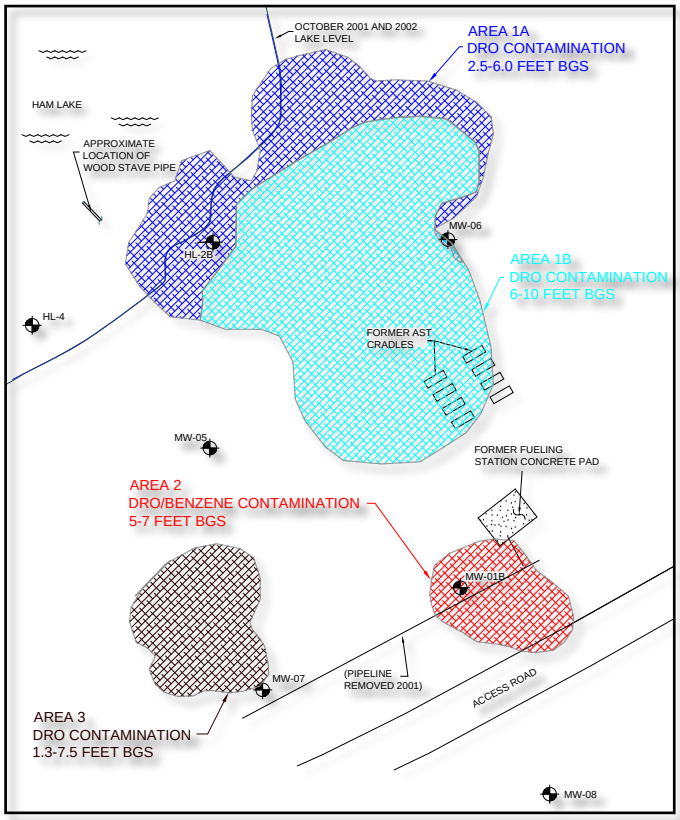


Figure 3. Extent of Remaining Soil Contamination

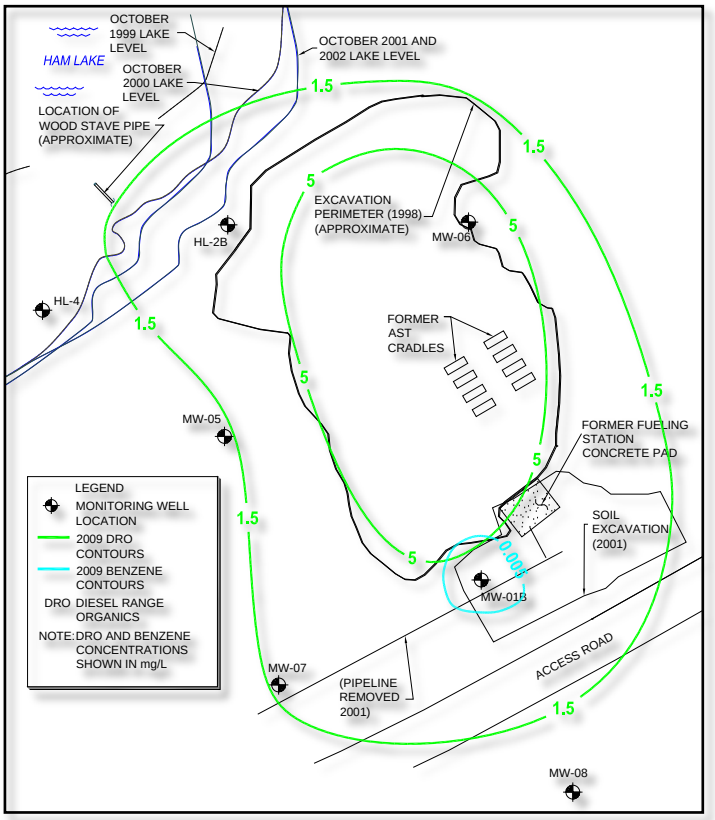


Figure 4. Extent of Remaining Groundwater Contamination

2.6.2 Risk Evaluation

The 1996 RI sampling results were used to evaluate the risk to human health and the environment associated with contaminants found at the site. The potential for human health effects associated with contacting the soil or inhaling the contaminants in the contaminated area was measured in two ways: excess cancer risk and hazard index (HI). The 1999 RI sampling results helped to resolve data gaps and complete the risk assessment.

The primary contaminant of concern at the Ham Lake site is DRO, due to its widespread presence in soil and groundwater at the site. Benzene also exceeds the ADEC cleanup level in soil and groundwater in a relatively small area and RRO has been detected after the RI above cleanup levels in three wells.

The nearest drinking water well, 265 feet deep subpermafrost well, is located at the airport and is located approximately 2,000 feet southwest of the Ham Lake site. This well and other Northway area drinking water wells were sampled during the Phase I RI and did not contain contaminant concentrations that exceeded the ADEC cleanup levels (Dames & Moore, 1995).

Human Health Risk Assessment

The cancer risk level is the additional chance that an individual exposed to a contaminant for a long period (30 years) will develop cancer over the course of a lifetime. It is expressed as a

probability such as $1x10^{-6}$ (one in a million). Typically, the Environmental Protection Agency (EPA) requires an action when risks exceed the range of $1x10^{-4}$ to $1x10^{-6}$. State of Alaska cleanup levels are based on a cancer risk of 1×10^{-5}. The hazardous index (HI) estimates the likelihood that exposure to the contaminant will cause some health effect other than cancer. If the HI score is less than 1.0, then health effects are not expected at the site.

The most significant exposure pathways at the Ham Lake site were soil ingestion and soil vapor inhalation assuming a house or building were placed on top of the contaminated soil. The chemicals associated with these risks are some of the volatile components of diesel fuel. The HI for the Ham Lake site, assuming someone living, recreating, and harvesting food directly on site, is 87. Likewise, the cancer risk is $1x10^{-4}$. Based on the exposure potential of these chemicals it was decided to clean up the contaminants that could lead to significant exposure.

Alternate risk-based soil cleanup levels were developed for the Ham Lake site by USACE in 1997 based on residential exposure assumptions. Although groundwater exists above permafrost beneath the site, it is unlikely to be used for drinking water purposes. Based on this and the fact that drinking water wells near the Ham Lake site are completed in groundwater that is below permafrost, human health risk screening of shallow groundwater and surface water at the Ham Lake site was performed using 1999 ADEC non-drinking water criteria. The concentrations of all petroleum constituents measured in Ham Lake surface water and sediments were below human health cleanup levels in 2000.

Risk Associated with Subsistence Activities

The shallow depth of soil contamination could potentially impact subsistence activities. However, the most heavily contaminated soils are greater than two feet deep so the transport of contaminated soils during rain events is not considered an exposure pathway. The outdoor inhalation pathway is a minor concern in Area 40 where benzene contamination is present.

Ecological Risks

An ecological risk assessment was conducted to determine if contaminated soil at Ham Lake poses a significant risk to the ecosystem. Results of the ecological risk assessment indicated that it is unlikely the contamination found in the soil at Ham Lake will have an adverse effect on the environment.

Concentrations of petroleum-related constituents in surface water and sediment samples collected from Ham Lake were below applicable clean up levels for the protection of aquatic life. These findings suggest that the residual levels of petroleum contamination in soils associated with the site are not significantly impacting aquatic life in Ham Lake. Drinking, agriculture, and water recreation regulations require that contaminants do not cause a visible sheen on the surface of the water. During annual groundwater sampling events, observations of the lake surface have not identified the presence of sheens

Drinking water usage of surface water is subject to the 18 AAC 70 and 18 AAC 75 Table C groundwater cleanup levels. Aquaculture and aquatic life usage requires that the total aqueous hydrocarbons (TAqH) concentration in the water column may not exceed 15 µg/L. Total

aromatic hydrocarbons (TAH) in the water column may not exceed 10 µg/l. Five surface water samples collected during the 2000 RI had non-detectable TAH concentrations; and TAqH concentrations ranging from 0.005 to 0.024 ug/L, all below the July 2008 AWQS 18 AAC 70 standards.

Unacceptable Risk to Human Health

The contaminant of concern is DRO based on the 2005 ROST report (USACE 2005) with an analytical sample with the maximum concentration of 28,300 mg/kg (4-5 feet below ground surface). The soil sample location is near well HL-2B. Currently the land is not being used by the landowner. Assuming that the appropriate institutional controls are adopted and enforced there would not be unacceptable risk to human health and the environment.

Potential Future Land Use

The area surrounding Ham Lake is currently owned by the ADOT as part of the Northway Airport property and is currently vacant land. ADOT has stated it does not have any current plans to change the land use. ADOT has agreed to adopt the land use controls associated with the institutional controls for the selected remedy. The ADOT agreement in email form is in Part 4 of this document.

2.6.3 Conceptual Site Model

The Conceptual Site Model for the Ham Lake site describes potential sources, release mechanisms, transport media, exposure routes, and human receptors. The primary contaminant sources at the Ham Lake site include the former ASTs, the former fueling station, and associated pipelines. The primary release mechanisms were spills at the ASTs and leaks along the pipeline connections to the filling station. Secondary contaminant sources include the movement of contaminants through soil into groundwater, surface water and through soil or groundwater into the air.

Potential exposure pathways include the ingestion of contaminated groundwater, soil, or sediments, dermal contact with contaminated groundwater, soil, or sediments, ingestion or dermal contact with contaminated surface water, and inhalation of volatilized contaminants in outdoor air. Potential receptors at the Ham Lake site include future residents, future commercial, industrial, or construction workers, current and future site visitors, trespassers, and recreational users, and current and future subsistence harvesters or consumers.

The primary contaminants of concern at Ham Lake are DRO, RRO and benzene. DRO and RRO compounds have low aqueous solubilities and high sorbing efficiencies onto carbon present in environmental media. Thus, these compounds have a high degree of retention in soils. The benzene contamination is observed in one monitoring well MW-01B and does not appear to be migrating.

The shallow depth of soil contamination could potentially impact subsistence activities. However, the most heavily contaminated soils are greater than two feet deep so the transport of contaminated soils during rain events is not considered an exposure pathway. Harvesting of wild

game could take place at the contaminated soil location. The outdoor inhalation pathway is a minor concern in Area 40 where benzene contamination is present.

Figure 5 presents a graphical conceptual site model (CSM) for Ham Lake. Potential receptors at the Ham Lake site include future residents, future commercial, industrial, or construction workers, site visitors, trespassers, and recreational users, and subsistence harvesters or consumers. Several potential exposure scenarios were identified in the conceptual site model:

- incidental ingestion of subsurface soil
- dermal contact with soil//groundwater
- ingestion of groundwater
- inhalation of outdoor air in Area 40

The potentially affected biological resources evaluated included vegetation, birds, fish, terrestrial mammals, and special status species.

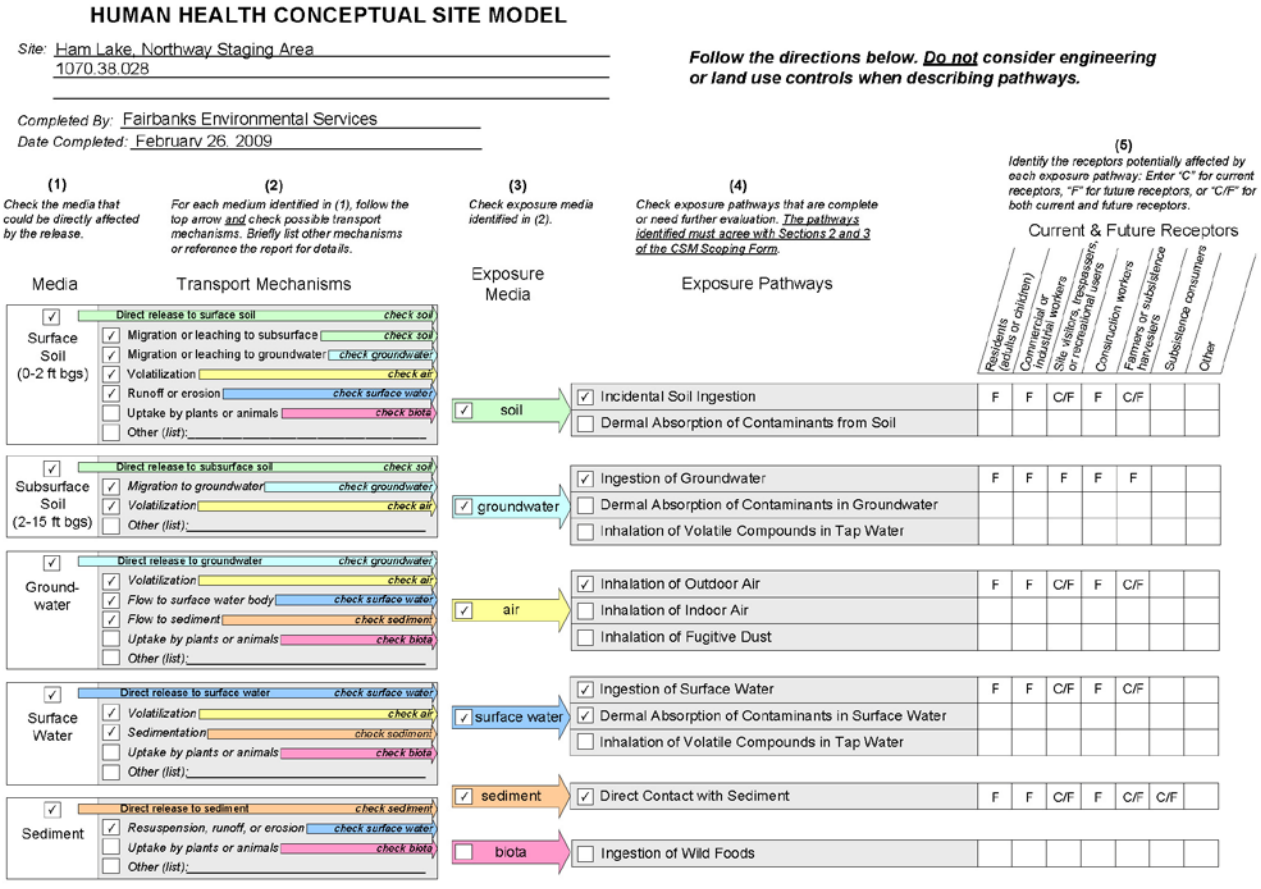


Figure 5. Conceptual Site Model

2.7 CURRENT AND POTENTIAL FUTURE SITE USES

The area surrounding Ham Lake is currently owned by the ADOT as part of the Northway airport property and is currently vacant land. ADOT has stated it does not have any current plans to change the land use. The site is accessible via car/truck, all-terrain vehicle, or on foot.

2.8 REMEDIAL ACTION OBJECTIVES

The remedial goals of the DERP-FUDS Program are to reduce the risk resulting from past Department of Defense activities to safe levels, in a timely, cost-effective manner. The Remedial Action Objectives (RAOs) for the Ham Lake site are to:

- Prevent current and future exposure to contaminated groundwater;
- Achieve soil cleanup levels equal to the cleanup levels in 18 AAC 75.341 Method 2 for migration to groundwater at the site; and
- Achieve groundwater cleanup levels equal to the cleanup levels in 18 AAC 75.345 Table C for groundwater at the site.
- Prevent disposal of contaminated soil in ecologically sensitive areas or wetlands.

Chemical-specific applicable regulations for Ham Lake site include regulations promulgated by the State of Alaska in the Oil and Other Hazardous Substances Pollution Control Regulations, 18 AAC 75.

Soil

The applicable cleanup level for DRO is 250 mg/kg, RRO is 11,000 mg/kg, and benzene is 0.025 mg/kg, based upon the migration to groundwater pathway for the under 40 inch zone in 18 AAC 75.341 Table B2.

In addition, the applicable soil cleanup levels for DRO, based on the ingestion and inhalation pathways for the under 40 inch zone, are 10,250 mg/kg and 12,500 mg/kg, respectively.

Groundwater

The applicable cleanup levels for groundwater are based on drinking water standards. For the protection of human health, the 18 AAC 75.345 Table C cleanup levels of 1.5 mg/L for DRO, 1.1 mg/L for RRO, and 0.005 mg/L for benzene, apply.

2.9 DESCRIPTION OF ALTERNATIVES

The Corps of Engineers considered in detail the numerous remedial alternatives for the Ham Lake site. The remedial alternatives for soil and groundwater are presented below.
The following four general response actions were identified for soil:

- No Action
- Institutional Controls/Containment Actions
- Ex-situ Treatment
- In-situ Treatment

Groundwater at the Ham Lake site is considered a potential drinking water source, although all existing drinking water wells are screened deeper within the subpermafrost aquifer. The nearest drinking water well is located approximately 2,000 feet southwest of the Ham Lake site. Six general response actions were identified for groundwater:

- No Action
- Institutional Controls
- Monitored Natural Attenuation
- Containment
- Ex-situ Treatment
- In-situ Treatment

Preliminary screening of other remedial technologies and general response actions was conducted during a Final Ham Lake Feasibility Study Report (FES, 2010). A range of other response actions were evaluated using qualitative cost, effectiveness, and implementability criteria to produce the short list of alternatives.

2.9.1 Alternative 1 – No Further Action

This alternative is used as a baseline for comparison to the active remedial alternatives at the site. Although natural processes may reduce hydrocarbon contamination to acceptable levels over time, this alternative does not include any long-term monitoring or modeling at the site.

2.9.2 Alternative 2 – Soil: Institutional Controls; Groundwater: Institutional Controls with MNA

The contaminated soil will be left in place and institutional controls concerning excavation work within the contaminated areas will be instituted. Institutional controls limiting access to the contaminated groundwater will be put in place. Contaminant degradation in the groundwater will be monitored using MNA. Long-term monitoring will occur at three year intervals, and sampling results for each event will be presented in a Groundwater Monitoring Report.

The following assumptions were made in estimating the cost for implementing this alternative:

- Institutional controls would include a notice of environmental contamination (e.g., deed notice) regarding residual soil and groundwater contamination.
- Institutional controls limiting access to the contaminated groundwater will be put in place. IC's would also include the provision for appropriate signage, if requested by the landowner, and public notifications.
- MNA of the groundwater would be conducted for 30 years. Groundwater monitoring would be conducted at three year intervals.

2.9.3 Alternative 3 – Soil: Removal of Contaminated Soil in All Areas and Thermal Treatment; Groundwater: Institutional Controls with MNA

All contaminated soil will be excavated and thermally treated at an off-site low temperature thermal desorption (LTTD). Institutional controls limiting access to the contaminated

groundwater will be put in place. Contaminant degradation in the groundwater would be monitored using MNA.

The following assumptions were made for implementing this alternative:

- The contaminated soil excavation plan would be based upon the ROST investigations and confirmation sampling conducted following previous soil excavations.
- Removal of contaminated soil would require dewatering. Water removed during dewatering would be treated onsite through activated carbon and discharged outside of the excavation area. Sheet piles would be driven on the lakeside of the excavation to prevent water infiltration from Ham Lake.
- Soil would be thermally treated at the OIT facility in Moose Creek, Alaska. Locally available material would be used for backfill.
- Institutional controls would include a notice of environmental contamination (e.g., deed notice) regarding residual contamination of the groundwater.
- Institutional controls limiting access to the contaminated groundwater will be put in place. IC's would also include the provision of appropriate signage, if requested by the landowner, and public notifications. The ICs may be removed from the site once pertinent risk-based standards are achieved.
- MNA for the groundwater would be conducted for biennially for 10 years to evaluate contaminant degradation.

2.9.4 Alternative 4 – Soil: Removal of Contaminated Soil in All Areas and Biocell Treatment; Groundwater: Institutional Controls with MNA

Alternative 4 is similar to Alternative 3 except that the contaminated soil would be excavated and treated on site using a biocell. Institutional controls limiting access to the contaminated groundwater will be put in place. Contaminant degradation in the groundwater would be monitored using MNA.

The following assumptions were made in estimating the cost for implementing this alternative:

- The contaminated soil excavation plan would be based upon the ROST investigations and confirmation sampling conducted following previous soil excavations.
- Removal of contaminated soil would require dewatering. Water removed during dewatering would be treated onsite through activated carbon and discharged outside of the excavation area. Sheet piles would be driven on the lakeside of the excavation to prevent water infiltration from Ham Lake.
- Soil would be treated in a biocell constructed on site. Treatment would be completed within 5 years based upon the results from the Ex-Situ Treatment Cell at the Northway ACS site. Annual soil sampling would evaluate the effectiveness of the biocell. Upon achievement of treatment goals the cell would be decommissioned and the soil spread on site.
- Institutional controls would include a notice of environmental contamination (e.g., deed notice) regarding residual contamination of the groundwater.
- Institutional controls limiting access to the contaminated groundwater will be put in place. IC's would also include the provision for appropriate signage, if requested by

the landowner, and public notifications. The ICs may be removed from the site once pertinent risk-based standards are achieved.
- MNA for groundwater would be conducted biennially for 10 years to evaluate contaminant degradation.

2.9.5 Alternative 5 – Soil: Removal of Soil from Area 2 only (benzene contaminated soil) and Thermal Treatment. Institutional Controls in Other Areas; Groundwater: Institutional Controls with MNA

The contaminated soil within Area 2 (benzene contaminated area) would be excavated and thermally treated off-site. Institutional controls would be maintained for contaminated soil in other areas of the site. Institutional controls limiting access to the contaminated groundwater will be put in place. Contaminant degradation in the groundwater would be monitored using MNA.

The following assumptions were made in estimating the cost for implementing this alternative:

- The contaminated soil excavation plan would be based upon the ROST investigations and confirmation sampling conducted following the previous soil excavations.
- Soil would be thermally treated at the OIT facility in Moose Creek, Alaska. Locally available material would be used for backfill.
- Institutional controls would include a notice of environmental contamination (e.g., deed notice) regarding residual contamination of the soil and groundwater.
- Institutional controls limiting access to the contaminated groundwater will be put in place. IC's would also include the provision for appropriate signage, if requested by the landowner, and public notifications. The ICs may be removed from the site once pertinent risk-based standards are achieved.
- MNA for groundwater would be conducted for 30 years. Groundwater monitoring would be conducted at three year intervals.

2.9.6 Alternative 6 – Soil: Removal of Contaminated Soil in All Areas from Above the Water Table and Thermal Treatment; Groundwater: In-Situ Bioremediation of All Areas and Institutional Controls

The contaminated soil above the water table would be excavated and thermally treated. An oxygen releasing chemical would be applied as a powder across the excavated area prior to backfilling. Contaminant degradation in the groundwater would be monitored using MNA.

The following assumptions were made in estimating the cost for implementing this alternative:

- The contaminated soil excavation plan would be based upon the ROST investigations and confirmation sampling conducted following the previous soil excavation.
- Soil would be thermally treated at the OIT facility in Moose Creek, Alaska. Locally available material would be used for backfill.
- Institutional controls would include a notice of environmental contamination (e.g., deed notice) regarding residual contamination of the groundwater.
- Institutional controls limiting access to the contaminated groundwater will be put in place. IC's would also include the provision for appropriate signage, if requested by

the landowner, and public notifications. The ICs may be removed from the site once pertinent risk-based standards are achieved.
- Groundwater sampling would be conducted biennially for 10 years to evaluate contaminant degradation.

2.9.7 Alternative 7 – Soil: Removal of Soil from Area 2 (benzene contaminated area) and Thermal Treatment. Institutional Controls in Other Areas; Groundwater: In-Situ Bioremediation of Area 2 only (benzene contaminated area). Institutional Controls with MNA in Other Areas

The contaminated soil above the water table in Area 2 (benzene contaminated soil) would be removed and thermally treated off-site. Institutional controls would be implemented in other soil contaminated areas. In-situ biodegradation would be conducted in Area 2 by applying an oxygen releasing chemical in the excavated area prior to backfilling. Institutional controls limiting access to the contaminated groundwater would be put in place. Contaminant degradation in the groundwater would be monitored using MNA.

The following assumptions were made in estimating the cost for implementing this alternative:

- The contaminated soil excavation plan would be based upon the ROST investigations and confirmation sampling conducted following the previous soil excavations.
- Soil would be thermally treated at the OIT facility in Moose Creek, Alaska. Locally available material would be used for backfill.
- An oxygen releasing chemical compound would be applied across Area 2 excavation prior to backfilling.
- Institutional controls would include a notice of environmental contamination (e.g., deed notice) regarding residual contamination of the soil and groundwater.
- Institutional controls limiting access to the contaminated groundwater will be put in place. IC's would also include the provision for appropriate signage, if requested by the landowner, and public notifications. The IC's may be removed from the site once pertinent risk-based standards are achieved.
- MNA for groundwater would be conducted for 30 years in other areas of the site. Groundwater monitoring would be conducted at three year intervals.

2.9.8 Alternative 8 – Soil: Institutional Controls; Groundwater: In-Situ Bioremediation of All Areas and Institutional Controls

The contaminated soil would be left in place, and institutional controls would be maintained for the contaminated soil. In-situ bioremediation would be conducted on contaminated groundwater in all areas of the site. Institutional controls limiting access to the contaminated groundwater would be put in place until treatment goals are achieved. Contaminant degradation in the groundwater would be monitored using MNA.

The following assumptions were made in estimating the cost for implementing this alternative:

- An oxygen releasing chemical would be injected across the contaminated groundwater plume in all contaminated areas. The chemical would be injected on a

10 foot by 10 foot grid. A single injection event is assumed to be effective in treating the contaminated groundwater.
- Institutional controls would include a notice of environmental contamination (e.g., deed notice) regarding residual contamination of the soil and groundwater.
- Institutional controls limiting access to the contaminated groundwater will be put in place. IC's would also include the provision for appropriate signage, if requested by the landowner, and public notifications. The ICs may be removed from the site once pertinent risk-based standards are achieved.
- MNA for groundwater would be conducted biennially for 10 years to evaluate contaminant degradation.

2.9.9 Alternative 9 – Soil: Institutional Controls; Groundwater: In-Situ Bioremediation of Area 2 (benzene contaminated area) only. Institutional Controls with MNA in Other Areas

The contaminated soil would be left in place and institutional controls would be maintained for the contaminated soil. In-situ bioremediation would be conducted for contaminated groundwater within Area 2. Institutional controls limiting access to the contaminated groundwater would be put in place. Contaminant degradation in the groundwater would be monitored using MNA.

The following assumptions were made in estimating the cost for implementing this alternative:

- An oxygen releasing compound would be injected across the contaminated groundwater plume within Area 2. The chemical would be injected on a 10 foot by 10 foot grid. A single injection event is assumed to be effective in treating the contaminated groundwater.
- Institutional controls would include a notice of environmental contamination (e.g., deed notice) regarding residual contamination of the soil and groundwater.
- Institutional controls limiting access to the contaminated groundwater will be put in place. IC's would also include the provision for appropriate signage, if requested by the landowner, and public notifications. The IC's may be removed from the site once pertinent risk-based standards are achieved.
- MNA for groundwater would be conducted for 30 years at three year intervals to continue to evaluate contaminant degradation.

A comparison of the alternatives evaluated is present in Table 3 Summary of Ham Lake site Remedial Alternatives. Alternatives 3 and 6 had the highest scores but also had the higher costs. Variations of these alternatives have been implemented in the past and have not achieved cleanup levels. Current site use favors Alternative 2 as it has the lowest cost with acceptable risk assuming that implementation of ICs are successful. Additional alternative details are presented in the Feasibility Study and Proposed Plan for Ham Lake.

Table 3 Detailed Analysis of Remedial Alternatives
Ham Lake FUDS, Northway, Alaska

Alternative	Overall Protection of Human Health and the Environment	Compliance with Pertinent Regulations	Long-Term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume	Short-Term Effectiveness	Implementability	Estimated Cost	NCP Evaluation Criteria Total Score
Remedial Alternative 1 No Action	Does not provide control for potential exposure of human or ecological receptors to hydrocarbon contamination. (Score = No)	Does not comply with Pertinent Regulations. (Score = No)	Current and potential future risk(s) remain the same. (Score = 0)	Does not reduce the toxicity, mobility, or volume of hydrocarbon in the soil or groundwater at the site. (Score = 0)	Not effective. Will not result in any additional risks to the community or the environment and, will eliminate potential risks to workers participating in the remedial action. However, hydrocarbon concentrations in soil and groundwater at the site will exceed ARARs for the foreseeable future. (Score = 0)	Readily implemented (Score = 5)	No cost (Score = 9)	14
Remedial Alternative 2 Soil: Institutional Controls Groundwater: Institutional Controls with MNA	Will protect human health and the environment by eliminating exposure to contaminated soil and groundwater. (Score = Yes)	Will achieve pertinent regulations for hydrocarbons in soil over time. Over time will achieve cleanup levels in the groundwater. (Score = Yes)	Contaminated soil will be left in place and may act as a continuing source of contamination to the underlying aquifer. Hydrocarbons in soil and groundwater will be allowed to attenuate naturally and will require long-term monitoring. (Score = 0.5)	Does not reduce the mobility or volume of hydrocarbon in the soil or the groundwater aquifer at the site. IC's limit the exposure to contaminants. Natural attenuation of groundwater contaminants is measured. (Score = 0.5)	Not effective. Hydrocarbon concentrations in soil and groundwater at the site will exceed ARARs for the foreseeable future. Implementing this alternative will not result in any additional risks to the community or the environment. (Score = 1)	Readily implemented Uncertainties associated with implementing this alternative include • The timeframe for natural attenuation of contaminated soil and groundwater is unknown. (Score = 4.5)	$270,827 (Score = 8)	14.5
Remedial Alternative 3 Soil: Removal of all contaminated soil and thermal treatment Groundwater: Institutional Controls with MNA	Will protect human health and the environment by eliminating exposure to contaminated soil and groundwater. (Score = Yes)	Will achieve pertinent regulations for hydrocarbons in soil. Over time will achieve cleanup levels in the groundwater. (Score = Yes)	Removing and treating the contaminated soil is both effective and permanent. Hydrocarbons in groundwater will be allowed to attenuate naturally and will require long-term monitoring. (Score = 5)	The toxicity and volume of hydrocarbon in the soil will be eliminated, and the toxicity and volume of hydrocarbon in the groundwater will eventually be reduced through natural attenuation. (Score = 5)	Very effective over the short-term. ARARs in soil would be achieved immediately after removing the contaminated soil. Achieving numerical cleanup levels in groundwater will likely take more than 10 years. Implementing this alternative will not result in any additional risks to the community or the environment. (Score = 4)	Uncertainties associated with implementing this alternative include: • Excavation of the soil below the water table and along the lake shore would be technically challenging. • The timeframe for the cleanup of the contaminated groundwater is unknown. (Score = 2)	$3,082,772 (Score = 2)	18
Remedial Alternative 4 Soil: Removal of all contaminated soil and biocell treatment Groundwater: Institutional Controls with MNA	Will protect human health and the environment by eliminating exposure to contaminated soil and groundwater. (Score = Yes)	Will achieve pertinent regulations for hydrocarbons in soil. Over time will achieve cleanup levels in the groundwater. (Score = Yes)	Removing and treating the contaminated soil is both effective and permanent. Hydrocarbons in groundwater will be allowed to attenuate naturally and will require long-term monitoring. (Score = 5)	The toxicity and volume of hydrocarbon in soil will be eliminated, and the toxicity and volume of hydrocarbon in the contaminated aquifer will eventually be reduced through natural attenuation. (Score = 5)	Effective over the short-term. ARARs for in-situ soil would be achieved immediately after removing the contaminated soil. Achieving ARARs in excavated soils would take up to 4 years. Achieving numerical cleanup levels in groundwater will likely take more than 10 years. Implementing this alternative will not result in any additional risks to the community or the environment. (Score = 3)	Uncertainties associated with implementing this alternative include: • Excavation of the soil below the water table and along the lake shore would be technically challenging. • The timeframe for treatment of soils in the Biocell. • The timeframe for the cleanup of the contaminated groundwater is unknown. (Score = 1)	$3,114,860 (Score = 1)	15
Remedial Alternative 5 Soil: Removal of contaminated soil from Area 2 only (benzene contaminated soil) and thermal treatment, with Institutional Controls in other areas. Groundwater:, Institutional Controls with MNA	Will protect human health and the environment by eliminating exposure to contaminated soil and groundwater. (Score = Yes)	Area 2 - Will achieve pertinent regulations for benzene in soil. Over time will achieve benzene cleanup level for groundwater. Areas 1 & 3 -- Will achieve pertinent regulations for hydrocarbons in soil over time. Over time will achieve cleanup levels in the groundwater. (Score = Yes)	Area 2 - Removing and treating the benzene contaminated soil is both effective and permanent. Hydrocarbons in groundwater will be allowed to attenuate naturally and will require long-term monitoring. Areas 1 & 3 - Contaminated soil will be left in place and may act as a continuing source of contamination to the underlying aquifer. Hydrocarbons in soil and groundwater will be allowed to attenuate naturally and will require long-term monitoring (Score = 1.5)	Area 2 - The toxicity and volume of benzene in the soil will be reduced, and the toxicity and volume of benzene in groundwater will eventually be reduced. Areas 1 & 3 - Does not reduce the toxicity, mobility, or volume of hydrocarbon in the soil. Toxicity and volume of hydrocarbon in the groundwater will eventually be reduced through natural attenuation. (Score = 2)	Area 2 -Very effective over the short-term. ARARs for benzene in soil would be achieved immediately after removing the contaminated soil. Achieving numerical cleanup levels in groundwater will likely take more than 10 years. Area 1 & 3 - Not effective - Hydrocarbon concentrations in soil and groundwater at the site will exceed ARARs for the foreseeable future. Implementing this alternative will not result in any additional risks to the community or the environment. (Score = 2)	Readily implemented. Uncertainties associated with implementing this alternative include • The timeframe for natural attenuation of contaminated soil and groundwater is unknown. (Score = 4)	$553,049 (Score = 6)	15.5

Table 3 Detailed Analysis of Remedial Alternatives
Ham Lake FUDS, Northway, Alaska

Alternative	Overall Protection of Human Health and the Environment	Compliance with Pertinent Regulations	Long-Term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume	Short-Term Effectiveness	Implementability	Estimated Cost	NCP Evaluation Criteria Total Score
Remedial Alternative 6 Soil: Removal of all contaminated soil above the water and thermal treatment Groundwater: In-situ bioremediation of groundwater in all areas	Will protect human health and the environment by eliminating exposure to contaminated soil and groundwater. (Score = Yes)	Will achieve pertinent regulations for hydrocarbons in soil. Over time will achieve cleanup levels for groundwater. (Score = Yes)	Removing and treating the contaminated soil is both effective and permanent. Hydrocarbons in groundwater will be bioremediated. (Score = 5)	The toxicity and volume of hydrocarbon in soil and groundwater will be eliminated. (Score = 5)	Very effective over the short-term. ARARs in soil would be achieved immediately after removing the contaminated soil. Achieving numerical cleanup levels in groundwater will likely take more than 10 years. Implementing this alternative will not result in any additional risks to the community or the environment. (Score = 5)	Uncertainties associated with implementing this alternative include: • Excavation of the soil along the lake shore would be technically challenging. • The effectiveness of bioremediation of groundwater is unknown. (Score = 3)	$1,781,800 (Score = 3)	21
Remedial Alternative 7 Soil: Removal of contaminated soil from above the water table in Area 2 only (benzene contaminated soil) and thermal treatment, Institutional Controls in other areas Groundwater: In-situ bioremediation of groundwater in Area 2, Institutional Controls with MNA in other areas.	Will protect human health and the environment by eliminating exposure to contaminated soil and groundwater. (Score = Yes)	Area 2 - Will achieve pertinent regulations for hydrocarbons in soil above the groundwater. Over time will achieve cleanup levels for soil below the water table and groundwater. Areas 1 & 3 -- Will achieve pertinent regulations for hydrocarbons in soil over time. Over time will achieve cleanup levels in the groundwater. (Score = Yes)	Area 2 - Removing and treating the contaminated soil is both effective and permanent. Hydrocarbons in soil below the water table and groundwater will be bioremediated. Areas 1 & 3 - Contaminated soil will be left in place and may act as a continuing source of contamination to the underlying aquifer. Hydrocarbons in groundwater will be allowed to attenuate naturally and will require long-term monitoring. (Score = 2.5)	Area 2 - The toxicity and volume of hydrocarbon in the soil will be reduced, and the toxicity and volume of hydrocarbon in the contaminated aquifer will eventually be reduced through natural attenuation. Areas 1 & 3 - Does not reduce the toxicity, mobility, or volume of hydrocarbon in the soil. Toxicity and volume of hydrocarbon in the groundwater will eventually be reduced through natural attenuation. (Score = 2)	Area 2 -Very effective over the short-term. ARARs in soil onsite would be achieved immediately after removing the contaminated soil. Achieving numerical cleanup levels in groundwater will likely take more than 10 years. Area 1 & 3 - Not effective.- Hydrocarbon concentrations in soil and groundwater at the site will exceed ARARs for the foreseeable future. Implementing this alternative will not result in any additional risks to the community or the environment. (Score = 2.5)	Uncertainties associated with implementing this alternative include: • The effectiveness of bioremediation of groundwater is unknown. (Score = 3)	$600,212 (Score = 5)	15
Remedial Alternative 8 Soil: No Removal, Institutional Controls Groundwater: In-situ bioremediation of groundwater in all areas	Will protect human health and the environment by eliminating exposure to contaminated soil and groundwater. (Score = Yes)	Will achieve pertinent regulations for hydrocarbons in soil over time. Over time will achieve cleanup levels for groundwater. (Score = Yes)	Contaminated soil will be left in place and may act as a continuing source of contamination to the underlying aquifer. Hydrocarbons in soil below the water table and groundwater will be bioremediated. (Score = 3)	Does not reduce the toxicity, mobility, or volume of hydrocarbon in the soil. The toxicity and volume of hydrocarbon in soil below the water table and groundwater will be reduced through bioremediation. (Score = 4)	Effective over the short-term. Achieving numerical cleanup levels in groundwater will likely take more than 10 years. Hydrocarbon concentrations in soil at the site will exceed ARARs for the foreseeable future. Implementing this alternative will not result in any additional risks to the community or the environment. (Score = 3.5)	Uncertainties associated with implementing this alternative include: • The effectiveness of bioremediation of groundwater is unknown. (Score = 3)	$906,382 (Score = 4)	17.5
Remedial Alternative 9 Soil: No Removal, Institutional Controls Groundwater: In-situ bioremediation of groundwater in Area 2. Institutional Controls with MNA in other areas.	Will protect human health and the environment by eliminating exposure to contaminated groundwater. (Score = Yes)	Area 2 - Will achieve pertinent regulations for hydrocarbons in soil over time. Areas 1 & 3 -- Will achieve pertinent regulations for hydrocarbons in soil over time; Over time will achieve cleanup levels in the groundwater. (Score = Yes)	Contaminated soil will be left in place and may act as a continuing source of contamination to the underlying aquifer. Hydrocarbons in soil below the water table and groundwater within Area 2 will be bioremediated. (Score = 1.5)	Does not reduce the toxicity, mobility, or volume of hydrocarbon in the soil. Reduces the toxicity, mobility, or volume of benzene in the soil below the water table and the groundwater in Area 2. Other areas remain unchanged. (Score = 1.5)	Effective over the short-term. Achieving numerical cleanup levels in groundwater in Area 2 will likely take more than 10 years. The numeric cleanup levels for soil and groundwater (in other areas) would not be achieved within the short term. Implementing this alternative will not result in any additional risks to the community or the environment. (Score = 2)	Uncertainties associated with implementing this alternative include: • The effectiveness of bioremediation of groundwater is unknown. (Score = 4)	$464,658 (Score = 7)	16

2.10 DETAILED ANALYSIS OF ALTERNATIVE

The cleanup of petroleum-oil-lubricant contaminated sites falls under the petroleum-exclusion of CERCLA and thus is being address under the authority of the DERP-FUDS program. However, as a matter of administrative convenience, CERCLA guidance is generally followed to evaluate remedial actions. Alaska's Site Cleanup Rules (18 AAC 75) are risk-based and considered pertinent regulations for the site. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) outlines the approach for comparing remedial alternatives using nine evaluation criteria that fall into three categories: threshold criteria, primary balancing criteria, and modifying criteria. The remedial alternatives were analyzed using the evaluation criteria outlined in the EPA's NCP. Each alternative was evaluated relative to the others based on the nine NCP criteria. The preferred alternative was selected considering cost, acceptable risk, and resulting potential ecological damage. A detailed analysis of Alternative 2 is provided below.

Threshold Criteria

Overall Protection of Human Health and the Environment

The remedy is protective of human health, the environment and complies with pertinent risk-based standards. The remedy institutes institutional controls providing landowner/public notification (e.g. notification of environmental contamination via deed notice) of the residual soil and groundwater contamination. Institutional controls will limit human exposure to the contaminated soil and groundwater. Contaminant degradation in the groundwater will be monitored using monitored natural attenuation.

Compliance with Pertinent Regulations

The primary contaminants of concern at Ham Lake are DRO, RRO and benzene. Pertinent risk-based standards include the 18 AAC 75 Method Two soil cleanup level for migration-to-groundwater pathway in the under-40-inch precipitation zone, which is 250 mg/kg for DRO, 11,000 mg/kg for RRO and 0.025 mg/kg for benzene to prevent further migration of contaminants from soil into the groundwater. The outdoor inhalation pathway is a minor concern in Area 40 where benzene contamination is present. For the protection of human health, the project objective is to prevent the ingestion or inhalation of contaminants above risk-based levels. The benzene in soil at the site is below the soil cleanup for inhalation at 11 mg/kg. The DRO in soil at the site exceeds the soil cleanup levels for the ingestion and inhalation pathways, which are 10,250 mg/kg and 12,500 mg/kg, respectively.

The primary contaminant of concern in groundwater is DRO, although RRO and benzene also exceed the ADEC cleanup level in a small area of the site. For the protection of human health the pertinent risk-based standards include the 18 AAC 75.345 Table C groundwater cleanup levels, which are 1.5 mg/L for DRO, 1.1 mg/L for RRO and 0.005 mg/L for benzene.

Primary Balancing Criteria

Short-Term Effectiveness

The implementation of the institutional controls can be enacted rapidly and thus provides short term effectiveness. Potential health effects can be limited with the use of proper personal protective equipment if necessary. Institutional controls would include a notice of environmental

contamination (e.g., deed notice) regarding residual contamination of the soil and groundwater. IC's would also include the provision of appropriate signage, if requested by the landowner, and public notifications.

Long-Term Effectiveness and Permanence

The remedy requires the need for long-term onsite management due to the institutional controls and groundwater monitoring at the site. The long-term effectiveness would depend on the natural attenuation of the soil and groundwater contaminants and proper implementation of ICs. The implementation of the alternative would be effective in the long term as contaminant concentrations in the soil and groundwater and would be mitigated through natural degradation, eliminating any potential future exposure risks to human health and the environment.

Reduction in Toxicity, Mobility, or Volume through Treatment

Considering over 40 years has elapsed since the fuel releases, it is likely the remaining contamination is not mobile in nature. Natural biological processes would continue to break down the remaining contamination over time to reduce toxicity.

Implementability

Institutional controls would require instituting notices with the current landowner and have average implementability. Monitored natural attenuation would require evaluating degradation rates and establishing regular reviews to ensure the approach would continue to protect human health and the environment and are easy to implement.

Cost

A detailed cost estimate was prepared for implementation of institutional controls and groundwater monitoring. Costs were based on best professional judgment and experience from previous work in Northway. The estimated costs are presented in Table 4.

The costs assume site work occurs in the summer and include: planning, mobilization, demobilization, surveying, maintenance and repairs, groundwater sampling, and final reports.

Table 4. Estimated Cost of Selected Remedy

Phase	**Cost**
Institutional Controls (soil and groundwater)	$20,000
Groundwater sampling for 30 years, includes well survey, repairs and reporting	$250,827
Total Present Worth	**$270,827**

Modifying Criteria

State Acceptance

This criterion evaluates whether the State of Alaska agrees with the analysis and recommendations resulting from the field investigations and the Proposed Plan. The ADEC has fully participated throughout the process at this site. The ADEC will provide a determination regarding the selected remedy under a separate cover.

Community Acceptance

A proposed plan (PP) was presented to the community of Northway in September 2011. Responses to the comments received are presented in the Responsiveness Summary. No comments were received from the Northway community to the proposed remedial action (comment period ended October 27, 2011). The meeting minutes are presented in Part 3.

2.11 SELECTED REMEDY

The selected remedy is institutional controls and monitored natural attenuation for the soil and groundwater. Residual contaminated soil will be left in place. Institutional controls will include a deed notice documenting the location and extent of residual contamination and informing the landowners of the requirement to notify ADEC and obtain approval prior to moving contaminated soil off-site or using, or pumping and discharging, contaminated groundwater. Groundwater monitoring will be conducted at three year intervals until cleanup levels are achieved or ADEC approves modifying or eliminating the monitoring. Monitoring will be conducted to verify the plume is stable or decreasing in size and that natural attenuation is occurring. Monitoring, IC inspections and reporting (at least every three years) will continue until cleanup levels are met or for 30 years, after which the remedy would be re-evaluated. Signs may be posted on the property, if requested by the landowner, stating the requirement to notify ADEC and obtain approval prior to moving contaminated soil off-site or using, or pumping and discharging, contaminated groundwater.

This approach limits potential for risk to public and the environment from unnecessary exposure to contaminants remaining at the site. Notification to the landowner will include the rationale for this determination as well as a description of the contamination remaining at the site, the spatial location of the contamination (including the coordinate system, datum, and units), the depth and lateral extent of the contamination, the potential health risks associated with the contaminants, and the activities to avoid and prevent exposure. A copy of this notification will be provided to ADEC.

A Notice of Environmental Contamination will be recorded with the State of Alaska Recorder's Office (e.g., deed notice) which documents the areas with residual soil and groundwater contamination, and describes the requirements for managing residual contamination in accordance with 18 AAC 75.325. ADEC approval is required prior to moving contaminated soil off-site and prior to using or pumping and discharging contaminated groundwater.

The ICs will include routine inspection, monitoring and reporting to verify that they are being maintained and are effective. The USACE will submit reports to ADEC at least every three years documenting the groundwater and IC monitoring results. The landowner will also be requested to provide immediate notification to ADEC in the event of planned land use change or any anticipated excavation or groundwater use in the area with residual contamination.

The need for landowner management of residual soil and groundwater contamination will be removed if future site investigations are undertaken that determine that natural attenuation processes have reduced contaminant concentrations to below the ADEC cleanup levels.

2.11.1 Summary of Rationale for the Selected Remedy

Based on the information available, USACE believes that the selected remedy will protect human health and the environment, comply with pertinent regulations, be cost-effective, and utilize permanent solutions.

There are no short-term threats associated with the selected remedy that cannot be readily controlled.

2.11.2 Description of Selected Remedy

The selected remedial action for the Ham Lake site is institutional controls and monitored natural attenuation for soil and groundwater within the contaminated areas. Groundwater contamination will be monitored to verify the plume is stable or decreasing in size and that natural attenuation is occurring. Monitoring will occur at three year intervals until contaminants are below Table C groundwater cleanup levels or ADEC approves modifying or eliminating the monitoring.

Institutional controls will be used to document the location and extent of contamination remaining at the site and the requirements to manage it properly. Natural attenuation will continue to reduce the petroleum contamination over time. The long-term monitoring will verify whether the concentrations are decreasing. The ADOT is the current landowner and has provided concurrence with the selected remedy.

2.11.3 Compliance of Selected Remedy with Pertinent Regulations

This criterion addressed whether the alternative meets the chemical-specific risk-based standards at the site. Petroleum hydrocarbons are excluded from regulation under CERCLA. Therefore, there are no CERCLA applicable or relevant and appropriate requirements (ARARs) with respect to this response action for POL. The Ham Lake site is a POL contaminated site, which falls under the CERCLA petroleum exclusion and is therefore being addressed under the authority of the DERP. The DERP provides authority to cleanup petroleum contamination when it may pose an imminent and substantial endangerment to public health, welfare or the environment. Alaska's Site Cleanup Rules (18 AAC 75 Article 3 Oil and Other Hazardous Substances Pollution Control) are risk based and indicative of when an imminent and substantial endangerment to the public health or welfare or the environment has been mitigated, and is the basis for the proposed actions. The remedial actions will prevent current and future exposure to contamination that exceeds risk-based, site-specific cleanup standards.

2.11.4 Summary of Estimated Remedy Cost

The estimated cost for the selected remedy is $271,000. The costs include planning, field work, survey, monitoring well repairs, periodic groundwater sampling, execution of soil and groundwater institutional controls and project reporting.

The information in Table 5 Estimated Cost of Selected Remedy is based on the best available information regarding the anticipated scope of the selected remedy. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the selected remedy. Major changes may be documented in the form of a

memorandum in the Administrative Record file, an Explanation of Significant Differences or a DD amendment.

Table 5. Estimated Cost of Selected Remedy

Phase	**Cost**
Institutional Controls (soil and groundwater)	$20,000
Groundwater sampling for 30 years, includes well survey, repairs and reporting	$250,827
Total Present Worth	**$270,827**

2.11.5 Expected Outcomes of the Selected Remedy

Toxicity, mobility and the protection of human health and the environment from onsite contamination will be reduced by the institutional controls for soil and groundwater. The long-term effectiveness would depend on the natural attenuation of the soil contaminants. The implementation of the alternative would be effective in the long term as contaminant concentrations in the soil would be mitigated through natural degradation, reducing any potential future exposure risks to human health and the environment. Natural biological processes would continue to break down the remaining contamination over time to reduce toxicity.

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PART 3: RESPONSIVENESS SUMMARY

No written comments were received on the *Proposed Plan for Remedial Action* from the Northway community members.

The community meetings were documented with the minutes presented below:

Community Meeting
Northway ACS and Ham Lake Formerly Used Defense Sites (FUDS) Proposed Plans
September 27, 2011
Northway Community Hall
Northway, Alaska

U.S. Army Corps of Engineers (USACE):	David Jadhon, Meseret Ghebresllassie, Jessequa Parker
Alaska Department of Environmental Conservation:	Deb Caillouet
Fairbanks Environmental Services (FES):	Bryan Johnson

The following Northway residents were in attendance at the meeting:

Howard Fix	Terry Albert
Lorraine Titus	Ricky Pitke
Belinda Thomas	Robert Beach

A meeting was held at the Northway Community Hall on September 27, 2011 to discuss the Proposed Plans for the Northway ACS Site and Ham Lake Site which are part of the FUDS program in Northway. Copies presentation handouts and the Proposed Plans were distributed and project posters were displayed. Extra Proposed Plans, presentations, and the posters were given to the Northway Native Inc, (NNI) President Lorraine Titus at the conclusion of the meeting.

Copies of the proposed plans were distributed to the people in attendance and a roundtable discussion was conducted. Ms. Lorraine Titus presented a concern that the USACE was closing out all projects at Northway. ADEC and USACE participants assured her that the USACE will to continue to address issues at the Northway Formerly Used Defense Sites. It was also explained that groundwater sampling would continue under ADECs supervision until site contaminants were no longer above ADEC cleanup levels. The Proposed Plan process including the procedure for commenting on the Proposed Plan, and the purpose of the Decision Document were reviewed.

Ham Lake Proposed Plan

The Ham Lake Proposed Plan preferred alternative is IC's on soil and groundwater with monitored natural attenuation. The landowner, ADOT, has previously accepted this alternative.

The previous soil removal actions were discussed and several residents stated that subsistence hunting and food gathering occurred at the site. A resident asked if the USACE personnel would swim in and drink the water from Ham Lake. The USACE responded by indicating they would be comfortable doing that based on historical results of groundwater, soil, and sediment sampling at the Ham Lake site.

A resident stated that the soil should be excavated and thermally treated. FES explained that two soil excavations have occurred and the soil was thermally treated and placed back onsite. ADEC continued the discussion that the remaining soil contamination presented in the proposed plan was at or below the groundwater table. The soil contamination is not on the ground surface but 2-7 feet below the ground surface.

USACE suggested that the community members continue providing comments, via email, phone calls or postal service during the 30 day public comment period for both the ACS and Ham Lake proposed plans. There were no additional comments received after the public meeting.

Administrative Record Update

Upon conclusion of the community meeting the administrative record was updated at the Public Library located at the Northway School. Fifteen hard copies of reports dated from 1997 through 2011 and two CD's containing nine electronic reports were delivered to the Northway School. An updated administrative record index sheet was also included in the delivery.

PART 4: ADOT AGREEMENT

The area surrounding Ham Lake is currently owned by the ADOT making it unlikely that the site would be developed for residential purposes in the foreseeable future. ADOT has agreed to adopt the land use controls associated with the institutional controls for the selected remedy. The ADOT agreement in email form is presented below.

From: Iles, Becky C (DOT) [mailto:becky.iles@alaska.gov]
Sent: Wednesday, January 06, 2010 11:34 AM
To: Ghebresllassie, Meseret C POA; Myers, Sam (DOT); Moody, Margaret J (DOT)
Cc: Jadhon, David A POA; Caillouet, Debra J (DEC); Kowalczyk, Thomas J (DOT)
Subject: RE: IC Northway Ham Lake Site FS

Sam, Tom and I have discussed the remedial alternatives and while we favor #6, we can accept 2, 3 or 6.
Please let us know if a formal letter is required.

-----Original Message-----
From: Ghebresllassie, Meseret C POA
[mailto:Meseret.C.Ghebresllassie@usace.army.mil]
Sent: Tuesday, January 05, 2010 2:27 PM
To: Myers, Sam (DOT); Iles, Becky C (DOT); Moody, Margaret J (DOT)
Cc: Jadhon, David A POA
Subject: FW: IC Northway Ham Lake Site FS

Dear Mr. Sam Myers,
US ACE Alaska district sent an electronic version of Environmental investigation document, "Ham Lake Feasibility Study Report Northway Staging Field" an August 20, 2009 to Ms. Marshall, Martha J and CC to Mr. Kowalczyk, Thomas J for DOT review and concurrence on the selected remedial alternative.

We are humbly requesting a letter of landowner (DOT) concurrence on the selected remedy for the subject site, so that we can proceed with the following CERCLA phase. Currency we are suffering Contract time lost on this document. We can't proceed to the next phase that is Proposed Plan and Decision Documents without your concurrence to finalize this document (FS).
Please understand the Government project funding process and your proactive response will help us work done on scheduled for the FY budget.

If you need additional information please call myself, or Mr. Jadhon, David at (907)753-2595 and the folks listed below.

Thanks

Meseret Ghebresllassie
Phone (907) 753-2670
Fax (907) 7532820

-----Original Message-----
From: Ghebresllassie, Meseret C POA
Sent: Thursday, August 20, 2009 10:04 AM
To: 'Marshall, Martha J (DOT)'
Cc: Kowalczyk, Thomas J (DOT)
Subject: RE: IC Northway

Marty,
Thank you for responding my call quickly. The ACE has been cleaning up the Ham Lake site since 1994. You will find all the chronological cleanup events summarized in this Feasibility Study (FS) document. The FS explains the appropriate selected remedy for the Ham Lake site. Alternative 2 (page 6-14) is a selected remedial action for this site that is Institutional Control with Monitored Natural Attenuation (MNA).
All the requirements of the IC are explained in page 6-9 under Alternative 2.
The IC has to be implemented by the landowner and that is why we want to you understand and concur with the IC.

Please let me know if you have any question or need more explanations.
May be our Contractor FES can explain to you about the site history more than I do.
ADEC Project Manager for Northway is Ms. Debra Caillouet, she has tremendous knowledge about the site too.
If you want to discuss with those people here is their contact number:

Mr. Bryan Johnson Contractor (FES) (907) 452-1235 or (907) 378-4763 Mr. Craig Martin Contractor (FES) (907) 452-1006 or (907) 388-4631 Ms. Debra Caillouet ADEC (907) 269-0298

If you want to meet in common place also it is fine with me or call or e-mail will work fine with me too.

Regarding the expired March 2009 Right of Way for Northway field activity; I will coordinate with my supervisor and back to you soon.

Thanks.

Meseret Ghebresllassie
Phone (907) 753-2670
Fax (907) 7532820
-----Original Message-----
From: Marshall, Martha J (DOT) [mailto:marty.marshall@alaska.gov]
Sent: Wednesday, August 19, 2009 4:32 PM
To: Ghebresllassie, Meseret C POA
Cc: Kowalczyk, Thomas J (DOT)
Subject: RE: IC Northway

Meseret, my mailing address is shown below. I'll get a copy of the letter I mentioned sent to you tomorrow morning. We look forward to receiving the environmental report.

Marty Marshall
Airport Leasing Specialist
State of Alaska DOT&PF
Aviation Leasing
2301 Peger Road
Fairbanks, AK 99709-5399

Telephone: (907) 451-5229

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PART 5: REFERENCES

Alaska Department of Environmental Conservation (ADEC), 2012. *18 AAC 75; Oil and Other Hazardous Substances Pollution Control.* April 8, 2012.

ADEC, 2010. *Division of Spill Prevention and Response, Contaminated Site Program, Policy Guidance on Developing Conceptual Site Models.* October 2010.

Dames and Moore, 1995. *Final Report 1994 Focused Remedial Investigation, Northway Staging Field Site, Northway, Alaska*. June 1995. F10AK034703_03.10_0500_a

Dames and Moore, 1997. *Focused Feasibility Study – Final, Ham Lake (Area 43), Northway Staging Field Site, Northway, Alaska.* July 1997. F10AK034703_04.09_0502_a

Fairbanks Environmental Services (FES), 2007. *Final 2006 Groundwater Monitoring and Free-Phase Product Recovery Report, Northway ACS and Northway Staging Field (Ham Lake and TACAN) FUDS.* March 2007. F10AK034703_07.02_0510_p

FES, 2010. *Ham Lake Feasibility Study Report, Northway Staging Field FUDS, Northway, Alaska*. February 2010. F10AK034706_04.09_0500_a

FES, 2011. *Proposed Plan, Ham Lake FUDS.* September 2011. F10AK034706_04.10_0500_a

FES, 2012. *2011 Treatment System Decommissioning and Groundwater Monitoring Report, Northway ACS and Staging Field Ham Lake FUDS, Northway, Alaska*. February 2012. F10AK034706_07.02_0502_p

Harding Lawson Associates/Wilder (HLA/Wilder), 1999. *Remedial Action Report, POL-Contaminated Soil Remediation Ham Lake and Grease Pit Sites, Northway, Alaska*. December 1999. F10AK034703_07.04_0504_p

National Oil and Hazardous Substances Pollution Contingency Plan (NCP), *Final Rule;55 FR 8666,* March 8, 1990; 40 CFR Part 300.

United States Army Corps of Engineers, (USACE), 1997a. *Residential Soil Cleanup Levels, Ham Lake, Northway, Alaska*. May 9, 1997. F10AK034703_04.02_0500_a

USACE, 1997b. *Proposed Plan for Remedial Action for Contaminated Soil at Operable Unit (OU) 2 - Ham Lake (Area 43) and Grease Pits (Area 27).* November 1997. F10AK034703_04.10_0505_a

USACE, 2005. *Final Contamination Delineation (ROST), Northway Staging Field Ham Lake Areas 40 and 43.* October 2005. F10AK034706_03.10_0500_a