US Army Corps of Engineers®

Formerly Used Defense Sites Program

Decision Document

Hazardous, Toxic, and Radioactive Waste (HTRW)
Project # F10AK017703
Northway Alaska Communication System (ACS)
Formerly Used Defense Site (FUDS)
Northway, Alaska

October 2012

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Acronyms and Abbreviations

AAC	Alaska Administrative Code
ACS	Alaska Communications System
ADEC	Alaska Department of Environmental Conservation
ARAR	Applicable or relevant and appropriate requirement
AST	Aboveground storage tank
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COPC	Contaminants of potential concern
CSM	Conceptual Site Model
CY	Cubic yards
DD	Decision Document
DERP	Defense Environmental Restoration Program
DOD	Department of Defense
DRO	Diesel range organics
EPA	United States Environmental Protection Agency
FES	Fairbanks Environmental Services
FUDS	Formerly Used Defense Site
HLA	Harding Lawson Associates
HTRW	Hazardous, Toxic, or Radioactive Waste
IC	Institutional Controls
JBER	Joint Base Elmendorf 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
NFA	No Further Action
NNI	Northway Natives Incorporated
O&M	Operations and maintenance
POL	Petroleum, oil, and lubricants
PP	Proposed Plan
RAO	Remedial action objective
ROST	Rapid optical screening tool
RRO	Residual range organics
USACE	United States Army Corps of Engineers – Alaska District
USC	United States Code
UST	Underground storage tank

PART 1: DECLARATION

1.1 SITE NAME AND LOCATION

The Northway Alaska Communications System (ACS) Formerly Used Defense Site (FUDS), project number F10AK0177-03, is located at Mile 1264 of the Alaska Highway near the junction of the Alaska Highway and the Northway Spur Road. Northway Junction is approximately 50 miles from Tok, Alaska and 42 miles from the Canadian border. Currently seven buildings are situated near the Northway ACS site which is approximately 9.5 acres. The buildings include a triplex apartment unit (no longer occupied), the former vehicle maintenance building, a privately owned residence and garage, the former power plant building, the former radio relay building (used as a community bingo hall), and a building jointly used by the State Troopers and Naabia Niign LTD (as a residential rental). Six of the seven buildings are owned by Naabia Niign LTD which is part of Northway Natives Inc (NNI). The Alaska Department of Environmental Conservation (ADEC) tracks details related to the site in the state's contaminated sites database under file number 170.38.027(ACS).

1.2 STATEMENT OF BASIS AND PURPOSE

This Decision Document presents the U.S. Army Corps of Engineers (USACE) selected remedy for the Northway ACS 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, et seq. 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 Joint Base Elmendorf-Richardson (JBER), 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. The property is owned by two separate parties, Naabia Niign LTD which is part of Northway Natives (NNI) and estate of Don Spitler.

Contaminated Soil – Petroleum contaminated soil remaining at the ACS site is primarily associated with releases from the former fuel pipeline and valve box. Fuel migrated horizontally and vertically through the overburden soil and into the weathered bedrock and eventually into the competent bedrock below. Fuel continued to migrate through bedrock fractures until it

encountered groundwater. The maximum depth of contaminated soil above the bedrock is between approximately 20 and 25 feet below ground surface (bgs). The total estimated amount of remaining petroleum contaminated soil exceeding ADEC cleanup levels is approximately 3,230 cubic yards and is only impacting Naabia Niign LTD property. The amount of fuel remaining within the bedrock fractures is unknown.

Contaminated Groundwater – A groundwater plume having diesel range organic (DRO) and residual range organics (RRO) concentrations exceeding ADEC cleanup levels is present at the site. The USACE installed eight groundwater monitoring wells at the site to delineate the groundwater contamination.

The contaminated groundwater plume is relatively well delineated and covers approximately 180,000 square feet. A residential drinking water well and the former water supply well for the ACS power plant are located within the contaminated groundwater plume. The two wells servicing the Triplex and the Trooper building have been sampled in the past years and results indicate they are not contaminated. 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 not expected within a reasonable timeframe.

1.4 DESCRIPTION OF THE SELECTED REMEDY

The Selected Remedy for the Northway ACS 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:

- 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,
- an alternative, new, deep, water supply system will be installed outside the known contaminant plume, and the distribution system will provide potable water to the privately owned (Spitler) residence;
- the two contaminated water supply wells (Spitler and Power Plant wells) will be decommissioned; and
- Groundwater monitoring, IC inspections and reporting 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.

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

Additional detailed information on the components of the ICs, groundwater monitoring and monitored natural attenuation are presented in Section 2.11.

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 and RRO groundwater contamination are the drivers for remediation at this site and the preparation of this Decision Document is consistent with CERCLA guidance.

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

The selected remedy will result in no CERCLA hazardous substances, pollutants, or contaminants remaining on-site above levels that would not allow for unlimited use and unrestricted exposure. However, POL remaining on the property, under state law, does not allow for unlimited use and unrestricted exposure. Long-term monitoring will occur at three year intervals, and sampling results for each event will be presented in a Groundwater Monitoring Report which will be reviewed by ADEC.

- An alternative, deep, water supply system will be installed outside the known contaminant plume, and the distribution system will provide potable water to the Spitler residence, institutional controls will be in place limiting access to the contaminated aquifer and will limit excavation work on site. Contaminant degradation in the aquifer media will be assessed every three years to verify the plume is stable or decreasing in size and that natural attenuation is occurring.

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Authorizing Signature

This Decision Document presents the Selected Remedy of an alternative, deep, water supply system to be installed outside the known contaminant plume, and the distribution system will provide potable water to the Spitler residence at Northway ACS FUDS at Northway, Alaska. In addition institutional controls will be implemented to prevent exposures to contaminated soil and groundwater at the ACS site.

This Decision Document will be incorporated into the Administrative File for the Northway ACS 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 Northway ACS FUDS (#F10AK0177-03), 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 and in compliance with State Law.

This document, presenting a selected remedy with a present worth cost estimate of $560,000, 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 _____

Christopher D. Lestochi
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PART 2: DECISION SUMMARY

This Decision Summary provides an overview of the conditions at the Northway ACS site, project number F10AK0177-03. 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 and State law.

2.1 SITE NAME, LOCATION, AND BRIEF DESCRIPTION

Northway is located in eastern interior Alaska near the Canadian border, approximately 285 air miles northeast of Anchorage, Alaska and 240 air miles east-southeast of Fairbanks. The ACS site is located at Mile 1264 of the Alaska Highway near the junction of the Alaska Highway and the Northway Spur Road in Northway Junction, and consists of a deactivated radio relay repeater site located on approximately 9.5 acres (Figure 1). The local community, Northway Village, is accessible by road from the Alaska Highway at Northway Junction and is approximately nine miles away.

Seven buildings are situated near the Northway ACS site. The buildings include a triplex apartment unit (no longer occupied), the former vehicle maintenance building which is presently used for storage, a privately owned residence and garage, the former power plant building, the former radio relay building is used by Naabia Niign LTD for a variety of purposes (used as a community bingo hall), and a building jointly used by the State Troopers and Naabia Niign LTD (as a residential rental). Six of the seven buildings are owned by Naabia Niign LTD which is part of Northway Natives (NNI). Currently, the surface estate is owned by Naabia Niign LTD and the subsurface estate is owned by Doyon, Limited. The deed to the private residence is held by the estate of Don Spitler.

The ACS site contains three domestic water supply wells; one is located northeast of the triplex apartments (Triplex well), a second is situated on the Spitler property (Spitler well) and the third is located at the Naabia Niign LTD/State Trooper building (Trooper well). The Triplex and the Trooper wells are owned by Naabia Niign LTD. The Trooper well currently provides potable water to the building tenants.

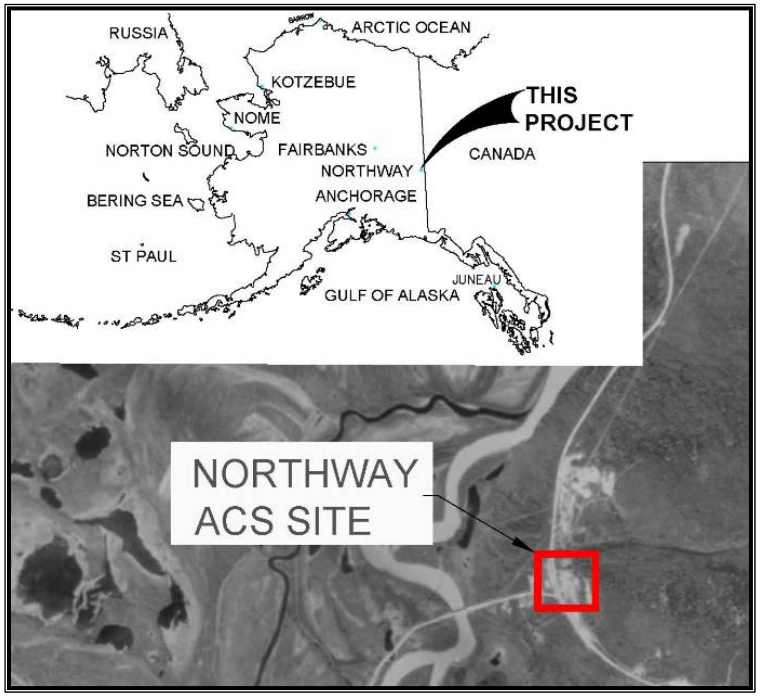

Figure 1. Northway ACS Location Map

The Triplex water supply well was disconnected in 2008 and is no longer in use. The Triplex Apartment Building is supplied with water from an aboveground holding tank that has been installed. The Triplex is not currently in use, and Naabia Niign LTD does not currently have plans for its use. From 1996 until the Triplex well was no longer operational it also supplied potable water to the Spitler residence. The Spitler well has not been in use as a potable water source since fuel contamination was identified shortly after the well was installed in 1997. There is also a 14-inch diameter water supply well within the north side of former power plant (Power Plant water supply well) which is not in use, and is covered and locked.

2.2 SITE HISTORY

The Northway ACS site is a deactivated radio relay repeater site located on approximately 9.5 acres near the junction of the Alaska Highway and Northway Airport Road in Northway Junction, Alaska. Northway ACS was operated from 1951 to 1962 by the U.S. Army Signal Corps and from 1962 through 1970 by the U.S. Air Force. The ACS site included a radio relay building, power plant, family housing quarters, vehicle maintenance garage, underground storage tanks (USTs), aboveground storage tanks (ASTs), aboveground and underground pipelines, overhead and underground utilities, and an office building. Figure 2 presents the ACS site features.

2.3 INVESTIGATION AND REMEDIAL ACTION HISTORY

Environmental investigations and cleanup activities have been ongoing at the Northway ACS site since 1985 and the following section describes the previous site activities.

Summary of Investigations and Remedial Activities

Site Inventory (1985)

The site was inventoried of military origin debris, ASTs, USTs and associated pipelines.

Removal Action (1995)

Two USTs, four ASTs, and associated piping were decommissioned. Drums and petroleum contaminated soil resulting from leaks and spills of the fuel transport and storage system were removed and disposed of.

Site Characterization (1998-1999)

A Site Characterization was conducted to further delineate the extent of soil contamination in the vicinity of the former used-oil sump, the hillside tank farm ASTs and the former pipeline.

Figure 2. Northway ACS Site Map

Site characterization borings drilled at the former Used-Oil Sump exceeded ADEC Method Two cleanup criteria for diesel range organics (DRO) in four of the six borings sampled. Borings from the former hillside tank farm area contained DRO, residual range organics (RRO), and toluene at low levels but did not exceed ADEC cleanup levels. Water samples from the three domestic water-supply wells contained DRO in five out of six samples.

Remedial Action (2000)

A remedial action was performed in the vicinity of the hillside tank farm AST area. The removal action included the removal of 191 cubic yards of DRO contaminated soil. Confirmation soil samples indicated that limited DRO contamination remained at the bottom of the excavation.

Additional Site Investigation (2003)

An investigation focused on further delineating the extent of soil contamination adjacent the former Power Plant Building, used-oil sump, and the former pipeline. DRO was found above ADEC cleanup levels in soils near the former Power Plant Building AST and near the former pipeline.

Feasibility Studies (2002, 2003)

A Feasibility Study (FS) was prepared for soil at the Northway ACS former used-oil sump area. Additional site investigation during 2003 found DRO contamination in groundwater samples from the Power Plant well, and a DRO soil plume extending from the former fuel pipeline. A revised FS was prepared in 2003 for soil at the Northway ACS site, including the former used-oil sump area, the Power Plant Building and the former fuel pipeline.

Groundwater Monitoring (2002-2004)

Groundwater monitoring of the three domestic water supply wells was performed between 2002 and 2004. Samples were analyzed for GRO, DRO, benzene, toluene, ethylbenzene, and xylenes (BTEX) and polynuclear aromatic hydrocarbons (PAH). The Spitler well was the only water supply well that consistently exceeded the ADEC cleanup level for DRO of 1.5 mg/L. No other contaminant exceeded ADEC cleanup levels. A water supply well located within the ACS Power Plant Building on the north side was discovered by ADEC and USACE during a site visit in 2001. A bailer was used to investigate the contents of the well in the fall of 2002 and the well was found to contain free product.

Free Product Evaluation and Recovery (2003-2005)

An investigation identified the characteristics of a 14-inch diameter water supply well located within the ACS Power Plant Building that was presumably used as the source of water for the boilers. A video camera was used to investigate the construction and condition of the well. A free product recovery test was performed in 2003 and total of 38 pounds (6 gallons) of diesel were evacuated from the well casing using passive product recovery sorbent booms. Free product recovery activities continued during 2004 and 2005 removing an additional 0.7 gallons of product.

ROST Investigation (2004 and 2006)

An investigation was conducted to identify and delineate potential fuel contamination at the site with a Rapid Optical Screening Tool (ROST) and its laser-induced fluorescence (LIF) probe. The ROST investigation successfully delineated the presence of petroleum impacted soil at the

Northway ACS site. Completion of forty probe pushes was sufficient to identify POL contamination in the vicinity of the power plant building and along the former pipeline. Soil samples showed DRO exceeding ADEC cleanup levels for migration to groundwater. An additional ROST investigation was conducted in 2006 to further delineate the extent of soil contamination.

Groundwater Investigation (2005)

Five groundwater monitoring wells were installed and sampled at the ACS site. The wells were installed into fractured bedrock at depths between 67 to 103 feet bgs. DRO was detected in groundwater samples from three out of the five wells exceeding the ADEC cleanup levels of 1.5 mg/L, and RRO was detected in two out of the five wells at concentrations exceeding the ADEC cleanup levels of 1.1 mg/L. The groundwater flow direction was towards the southwest, in the general direction of the topography. Geochemical and biological activity analyses on groundwater samples demonstrated that contaminant biodegradation was occurring at the site; however the degradation rate may be relatively slow.

Additional Groundwater Investigation and Free Product Recovery (2006)

Three groundwater wells were installed to better delineate the groundwater contaminant plume. The new and the existing monitoring and domestic water supply wells (with the exception of the Spitler well) were sampled. The Naabia Niign Campground well, which is located over 1,000 feet south of the site, across the Alaska Highway, was also sampled. Contaminant concentrations were not detected above reporting limits in the Naabia Niign Campground well and the well was excluded from future groundwater sampling. DRO exceeded the ADEC cleanup level of 1.5 mg/L in all three of the new monitoring wells, and RRO exceeded the ADEC cleanup level of 1.1 mg/L in two wells. The highest DRO concentration, 8.26 mg/L, was detected well 2006-03, located on the north side of the ACS Power Plant Building near the former used-oil sump. The groundwater flow direction determined during this sampling event was more southerly than the direction determined in 2005. Approximately 0.19 gallons of product was recovered from the Power Plant water supply well during 2006. Due to diminishing recovery rates, product recovery was discontinued.

Soil Treatability Studies (2006-2009)

Two soil treatability studies were conducted to evaluate the feasibility of *in-situ* and *ex-situ* bioventing of contaminated soil. The *in-situ* bioventing study was conducted south of the former power plant building near the former valve box and pipeline. Relatively low biodegradation rates were measured across the treatment area. The study was conducted during 2006 and 2007 and was discontinued after samples collected in 2007 indicated that DRO contaminant concentrations did not change significantly. The study resulted in showing that *in-situ* bioventing was not a feasible remedial option.

The *ex-situ* bioventing treatability study was conducted immediately southeast of the *in-situ* treatability study area. The study involved excavating 270 cubic yards of petroleum contaminated soil from the used soil sump adjacent the former Power Plant building. Significantly higher biodegradation rates were achieved for the *ex-situ* study compared to the *in-situ* study with a maximum rate of 4.41 mg/kg per day. The *ex-situ* study was operated seasonally between 2006 and 2009 and was shut down after achieving cleanup goals. *Ex-situ* bioventing successfully treated approximately 270 cubic yards of petroleum contaminated soil

that had been excavated near the ACS Power Plant in 2006. Both treatability study systems were decommissioned during September 2011.

Groundwater Monitoring (2007-2010)

Groundwater samples were collected and analyzed from groundwater and domestic water supply wells (with the exception of the Spitler and Naabia Niign Campground wells). Contaminant concentrations were similar to results from 2006 with the exception of DRO in well 2006-3 which contained free product in three of six measurement events. Product was detected in one of the four measurements of the Power Plant water supply. Groundwater samples collected from 2008 through 2010 included the eight monitoring wells and the Trooper water supply well. The Triplex water supply well was eliminated in 2008 from the sampling program because the well was no longer operational.

Feasibility Study Report (2008)

A Feasibility Study (FS) was prepared to identify and evaluate remedial alternatives for the ACS site. The FS summarized previous site activities, identified remedial action objectives, evaluated applicable remedial technologies, and analyzed eight alternatives to address soil and groundwater contamination.

2.4 ENFORCEMENT HISTORY

Remedial investigation and removal work at the Northway ACS 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 Northway ACS site.

2.5 COMMUNITY RELATIONS ACTIVITIES

Public participation has been an important component of the CERCLA process at the Northway ACS site.

A public meeting was conducted to discuss the Northway ACS project status and developments in September 2008. A 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 the community since a local newspaper does not exist. Part 3 presents the meeting minutes.

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-Richardson (JBER).

2.6 SUMMARY OF SITE RISKS

2.6.1 Nature and Extent of Contamination

The contaminated media at the Northway ACS are soil and groundwater. The original evaluation of the nature and extent of contamination was based on data collected during the 1995 removal action. 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 and RRO were identified as COPCs at the site. A summary of the results of historical field sampling performed and the contaminants above ADEC Cleanup levels is provided in Table 1 and Table 2.

Table 1. Contaminants Detected Above Cleanup Levels in Soil (1995-2007)

Contaminant	ADEC Method 2 Cleanup Level (mg/kg)	Range of Detected Values (mg/kg)	Frequency of Detection above Method 2 Levels
DRO	250	ND – 37,000	137/252
RRO	11,000	ND – 12,200	1/106

These values represent soil that was excavated and treated.

Table 2. Contaminants Detected Above Cleanup Levels in Water (1999-2010)

Contaminant	ADEC Table C Cleanup Level (mg/L)	Range of Detected Values (mg/L)	Frequency of Detection above Table C Levels
DRO	1.5	ND – 18.0	43/99
RRO	1.1	ND – 1.58	12/52

Free product has been observed in groundwater monitoring well 2006-03 and in the former Power Plant building well. During the winter 1995 removal action (HLA, 1995), a total of 268 cubic yards of POL contaminated soil was removed from the site and shipped offsite for disposal. In 2000 a remedial action was performed in the vicinity of the hillside tank farm area. The removal action included the removal of 191 cubic yards of DRO contaminated soil. The 2004 Feasibility Study did not have any RRO exceedances existing after soil removals and also had a maximum DRO of 8,700 mg/kg at 8 feet bgs.

There are no exceedances of the ingestion/inhalation values currently at the ACS site; therefore there is no risk for those pathways. The *ex-situ* soil treatability study (FES, 2006) excavated and treated approximately 270 cubic yards. Figures 3 and 4 present the extent of soil contamination remaining on site. Figure 5 presents the remaining groundwater contamination on site.

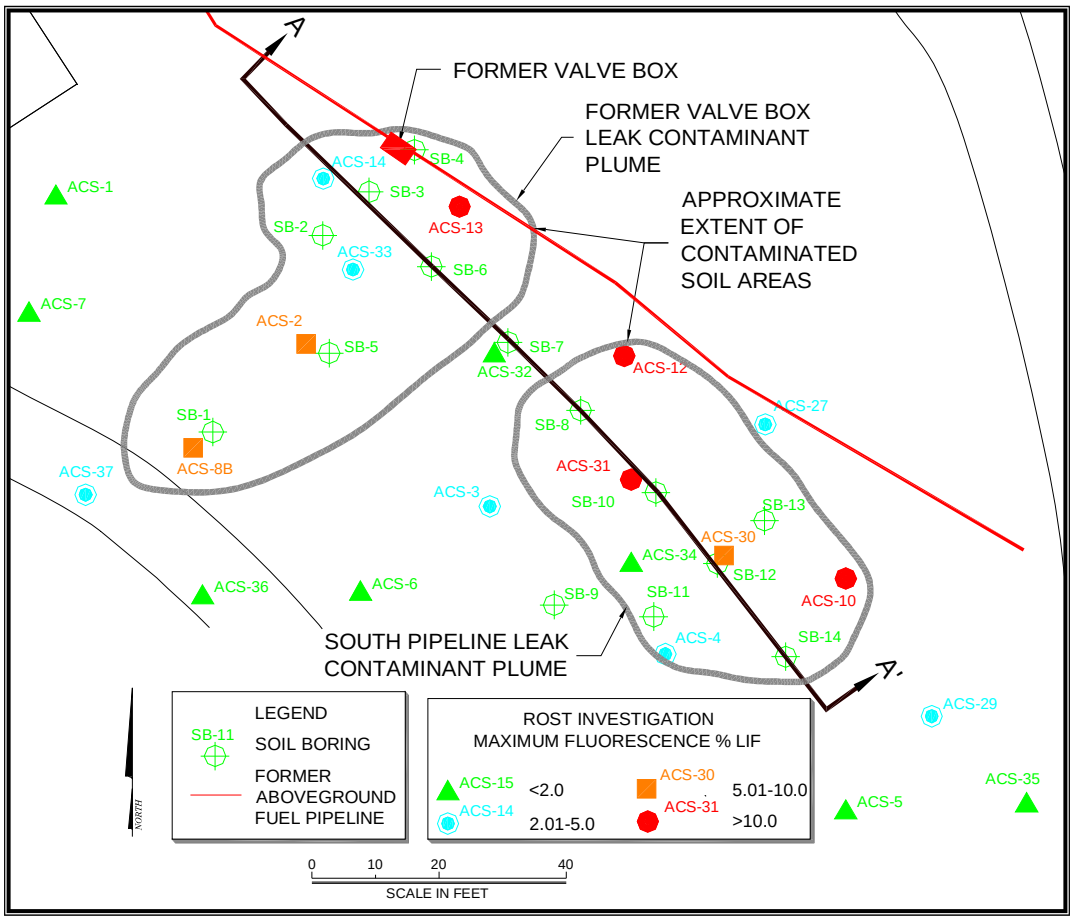

Figure 3 Estimated Extent of Contaminated Soil Associated with the Former Valve Box and South Pipeline Leaks

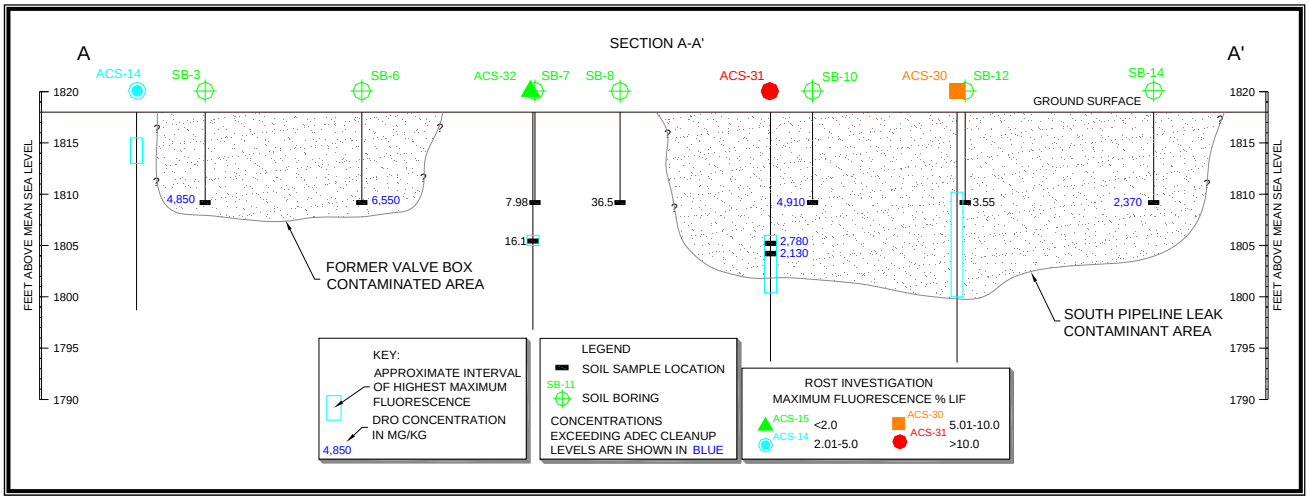

Figure 4 Cross Section A-A’ of Estimated Extent of Contaminated Soil Associated with the Former Valve Box and South Pipeline Leaks

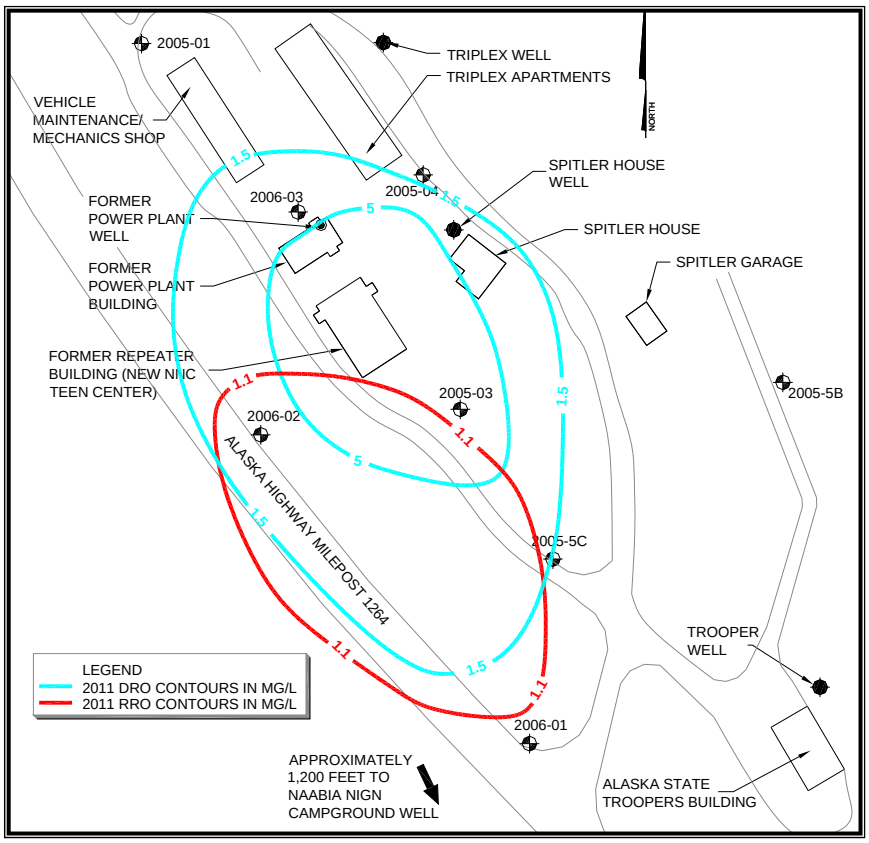

Figure 5 Contaminated Groundwater Plume at Northway ACS

2.6.2 Risk Evaluation

The primary contaminant sources at the Northway ACS site include leaks along piping connections at the valve boxes, and direct discharge into the former used-oil sump. Secondary contaminant sources include the movement of contaminants through soil into groundwater.

Exposure pathways that were considered include the ingestion of contaminated groundwater or soil, uptake of contaminated water by plants and dermal contact of contaminated soil. Potential receptors at the ACS site include residents and other users of the buildings located at the site. Since a drinking water well is located within the contaminant plume, ingestion of contaminated groundwater is a complete exposure pathway.

The inhalation and ingestion pathways are considered insignificant since the contaminants of concern (DRO and RRO) at the Northway ACS site are below the applicable cleanup levels.

Unacceptable Risk to Human Health

The presence of DRO in the Spitler well that exceeds the ADEC cleanup level presents an unacceptable risk to human health. Assuming that the appropriate institutional controls and alternative water supply well are adopted and enforced there would not be unacceptable risk to human health and the environment.

Risk Associated with Subsistence Activities

Subsistence activities are not anticipated since the contaminated area is comprised mainly of buildings and roads, and does not support food plants. Harvesting of wild game does not take place within the site boundaries.

Ecological Risks

The most heavily contaminated soils are at depth (>2 feet below ground surface (bgs)) so the transport of contaminated soils during rain events is not considered a pathway. Surface water is not present at the site and therefore no related ecological risks.

Potential Future Land Use Controls

There are currently two landowners at the ACS site; Naabia Niign LTD and the Spitler estate. Naabia Niign LTD owns the Triplex apartments, ACS building and the Trooper building. The Spitler property is currently unoccupied and for sale. The Triplex is not currently in use, and Naabia Niign LTD does not currently have plans for its use. The ACS building is currently being used as the community bingo hall. The State of Alaska Troopers occupies the eastern portion of the Trooper building and the western portion is a rental property that is currently not occupied.

2.6.3 Conceptual Site Model

The Conceptual Site Model for the Northway ACS site describes potential sources, release mechanisms, transport media, exposure routes, and human receptors. The primary contaminant sources at the Northway ACS site include the two former ASTs, associated piping and valve boxes; and the former used-oil sump. The primary release mechanisms were spills at the ASTs, leaks along piping connections at the valve boxes, and direct discharge into the former used-oil sump. Secondary contaminant sources include the movement of contaminants through soil into groundwater, and through soil or groundwater into the air. Exposure pathways include the ingestion of contaminated groundwater or soil, uptake of contaminated water by plants, dermal contact of contaminated media, or fugitive dust. Subsistence activities are not anticipated since the contaminated soil at the site is primarily sand and gravel, and does not support food plants. DRO and RRO are not bio-accumulated in plant uptake. Potential receptors at the ACS site include residents and other users of the buildings located at the site.

The primary contaminants of concern at Northway ACS are DRO and RRO. These 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 inhalation pathway was considered insignificant since the primary contaminants of concern at the Northway ACS site are DRO and RRO.

Figure 6 presents a graphical conceptual site model (CSM) for Northway ACS. Human receptors are expected to include residents, site visitors, and future commercial or industrial workers. Several potential exposure scenarios were identified in the conceptual site model:

- dermal contact with groundwater
- ingestion of groundwater

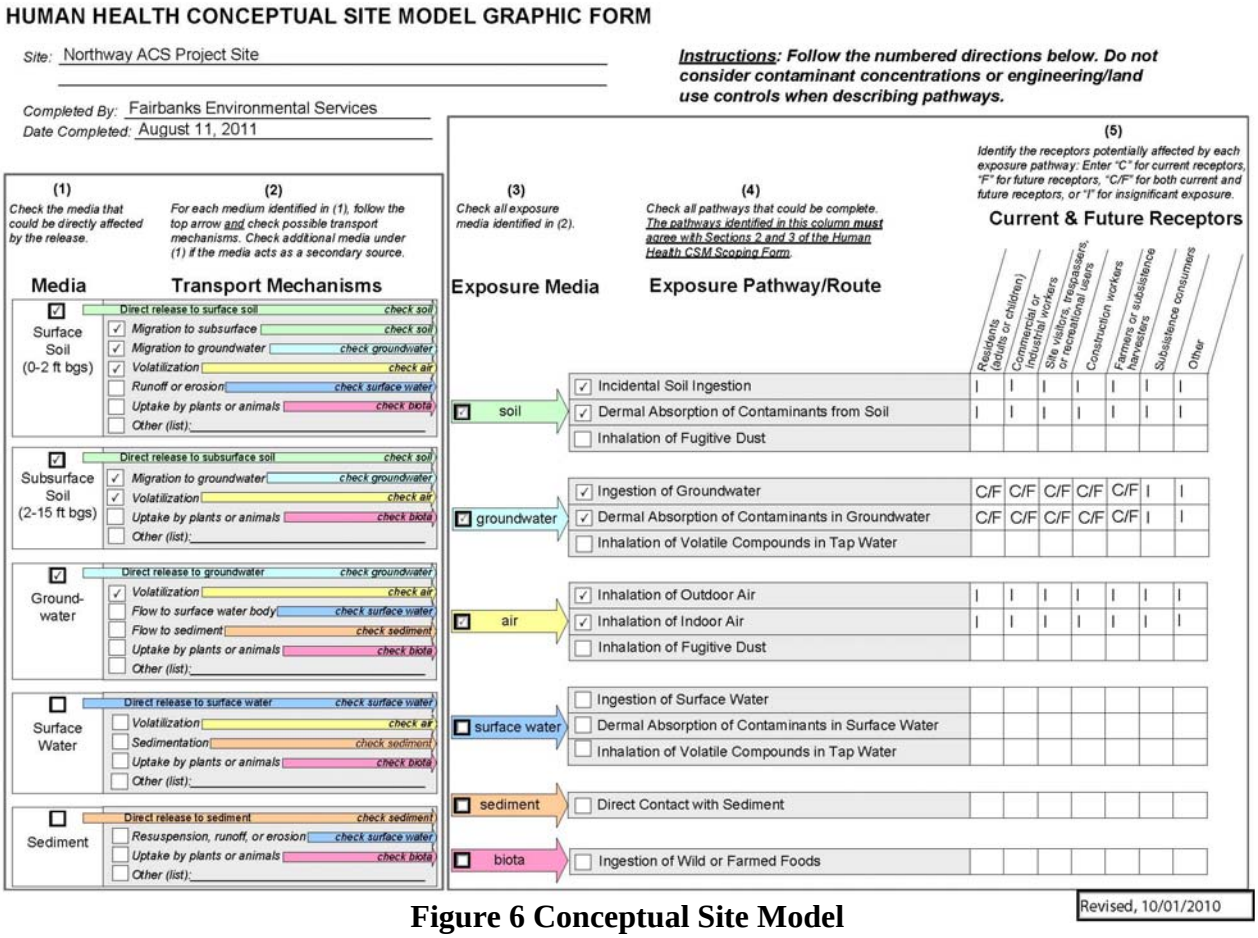

Figure 6 Conceptual Site Model

2.7 CURRENT AND POTENTIAL FUTURE SITE USES

There are currently two landowners at the ACS site; Naabia Niign LTD and the Spitler estate. The site is accessible via car/truck, all-terrain vehicle, or on foot. Future land uses are expected to be residents, building occupants and commercial/industrial workers. Northway Natives Inc, the village corporation over Naabia Niign LTD, and the Spitler estate have agreed to adopt the land use controls associated with the institutional controls that limit excavation work within the contaminated areas that are part of the selected remedy. The land use controls will prevent exposure to contaminated soil and groundwater from the site.

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 Northway ACS site are to:

- Prevent current and future exposure to contaminated groundwater.
- Achieve soil cleanup levels equal to the cleanup levels in 18 AAC 75 Method 2 for migration to groundwater at the site;
- 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 Northway ACS site include regulations promulgated by the State of Alaska in the Oil and Other Hazardous Substances Pollution Control Regulations, 18 AAC 75.

Soil

The cleanup level for DRO is 250 mg/kg based upon the migration to groundwater pathway for the under 40" zone in 18 AAC 75.341 Table B2.

Groundwater

The contaminates of concern are DRO and RRO in the groundwater, which is a drinking water source. For the protection of human health the 18 AAC 75.345 Table C groundwater cleanup levels of 1.5 mg/L DRO and 1.1 mg/L RRO apply.

2.9 DESCRIPTION OF ALTERNATIVES

The Corps of Engineers considered in detail the numerous remedial alternatives for the Northway ACS 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
- Source Removal
- *In-situ* Treatment

Considering the contaminated groundwater is a potential drinking water source, and can be accessed by a private resident or by breaching the locked power plant supply well, six general response actions were identified for groundwater:

- No Action
- Institutional Controls
- Monitored Natural Attenuation
- Alternative Residential Water Supply
- Containment
- *Ex-situ* Treatment

Preliminary screening of other remedial technologies and general response actions was conducted during a Final Northway ACS Feasibility Study Report (FES, 2008). 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 Action

The No Action alternative is required to be used as a baseline to compare all other responses.

This alternative is used as a baseline for comparing the active remedial alternatives to no action 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. It also does not prevent the ingestion of contaminated groundwater.

2.9.2 Alternative 2. Soil: Institutional Controls, Groundwater: Institutional Controls with monitored natural attenuation (MNA)

The contaminated soil will be left in place, and institutional controls limiting excavation work within the contaminated areas will be instituted. Institutional Controls limiting access to the contaminated aquifer will be put in place and the two contaminated water supply wells (Spitler and Power Plant wells) will be decommissioned. Contaminant degradation in the aquifer media 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.

2.9.3 Alternative 3. Soil: Removal to Bedrock, Groundwater: Alternative Water Supply Well, Institutional Controls with MNA

The contaminated soil plumes originating from the pipeline leaks will be excavated to bedrock. Treatment of the contaminated soil will be off-site low temperature thermal desorption (LTTD). A new, deep, water supply system will be installed outside the known contaminant plume, and the distribution system will provide potable water to the Spitler residence. Institutional Controls limiting future access to the contaminated aquifer will be put in place, and the two contaminated water supply wells (Spitler and Power Plant wells) will be decommissioned. Contaminant degradation in the aquifer media will be monitored using MNA.

The following assumptions were made for implementing this alternative:

- The average depth to bedrock in the two contaminated soil areas was considered to be 22 feet bgs;
- An adequate supply of uncontaminated groundwater can be located upgradient of the contaminated groundwater plume, within 250 feet of the Spitler residence; and
- Maintenance of the new water system serving the Spitler residence is turned over to the landowner.

Long-term monitoring occurs at three year intervals, and sampling results each event will be presented for in a Groundwater Monitoring Report.

2.9.4 Alternative 4. Soil: Removal to 10 feet bgs, ICs on soil greater than 10 feet bgs; Groundwater: Alternative Water Supply Well, Institutional Controls with MNA

The contaminated soil plumes originating from the pipeline leaks will be excavated to a depth of 10 feet bgs. Treatment of the contaminated soil will be off-site LTTD. A new, deep, residential water supply system will be installed outside the known contaminant plume, and the distribution system will provide potable water to the Spitler residence. Institutional Controls limiting access to the contaminated aquifer will be put in place, and the two contaminated water supply wells (Spitler and Power Plant wells) will be decommissioned. Contaminant degradation in the aquifer media will be monitored using MNA.

The following assumptions were made for implementing this alternative:

- Removing and replacing contaminated soil to a depth of 10 feet will allow future site use/development;
- An adequate supply of uncontaminated groundwater can be located upgradient of the contaminated groundwater plume, within 250 feet of the Spitler residence; and
  Maintenance of the new water system serving the Spitler residence is turned over to the landowner.

Long-term monitoring occurs at three year intervals, and sampling results each event will be presented for in a Groundwater Monitoring Report.

2.9.5 Alternative 5. Soil: Removal to Bedrock, Groundwater: Point-of-Use Treatment, Institutional Controls on Aquifer Media Use with MNA

The contaminated soil plumes originating from the pipeline leaks will be excavated to bedrock. Treatment of the contaminated soil will be off-site LTTD. The Spitler well will be equipped with a point of use treatment system which will remove the petroleum from the groundwater prior to use. Institutional Controls limiting access to the contaminated aquifer will be put in place, and the contaminated water supply well in the Power Plant building will be decommissioned. Contaminant degradation in the aquifer media will be monitored using MNA.

The following assumptions were made for implementing this alternative:

- The average depth to bedrock in the two contaminated soil areas was considered to be 22 feet bgs; and
- The Point-of-Use system will be operated for 30 years, and O&M costs will be borne by the government.

There are O&M and periodic costs associated with this alternative; the point of use treatment system will require maintenance four times per year in Year 0, and two times per year in Years 1- 30. Long-term monitoring occurs at three year intervals, and sampling results each event will be presented for in a Groundwater Monitoring Report.

2.9.6 Alternative 6. Soil: Removal to 10 feet bgs, Groundwater: Point-of-Use Treatment, Institutional Controls on Aquifer Media Use with MNA

The contaminated soil plumes originating from the pipeline leaks will be excavated to a depth of 10 feet bgs. Treatment of the contaminated soil will be off-site LTTD. The Spitler well will be equipped with a point of use treatment system which will remove the petroleum from the groundwater prior to use. Institutional Controls limiting access to the contaminated aquifer will be put in place, and the contaminated water supply well in the Power Plant building will be decommissioned. Contaminant degradation in the aquifer media will be monitored using MNA.

The following assumptions were made for implementing this alternative:

- Removing and replacing contaminated soil to a depth of 10 feet will allow future site use/development; and
- The Point-of-Use system will be operated for 30 years, and O&M costs will be borne by the government.

There are O&M and periodic costs associated with this alternative; the point of use treatment system will require maintenance four times per year in Year 0, and two times per year in Years 1- 30. Long-term monitoring occurs at three year intervals, and sampling results each event will be presented for in a Groundwater Monitoring Report.

2.9.7 Alternative 7. Soil: No Removal, Institutional Controls, Groundwater: Alternative Water Supply Well, Institutional Controls on Aquifer Media Use with MNA

The contaminated soil will be left in place, and institutional controls limiting excavation work within the contaminated areas will be instituted. A new, deep, water supply system will be installed outside the known contaminant plume, and the distribution system will provide potable water to the Spitler residence. Institutional Controls limiting access to the contaminated aquifer will be put in place, and the two contaminated water supply wells (Spitler and Power Plant wells) will be decommissioned. Contaminant degradation in the aquifer media will be monitored using MNA.

The following assumptions were made for implementing this alternative:

- An adequate supply of uncontaminated groundwater can be located upgradient of the contaminated groundwater plume, within 250 feet of the Spitler residence;
- Maintenance of the new water system serving the Spitler residence is turned over to the landowner.

Long-term monitoring occurs at three year intervals, and sampling results each event will be presented for in a Groundwater Monitoring Report.

2.9.8 Alternative 8. Soil: No Removal, Institutional Controls, Groundwater: Point-of-Use Treatment, Institutional Controls on Aquifer Media Use with MNA

The contaminated soil will be left in place, and institutional controls limiting excavation work within the contaminated areas will be instituted. The Spitler well will be equipped with a point of use treatment system which will remove the petroleum from the groundwater prior to use. Institutional controls limiting access to the contaminated aquifer will be put in place, and the contaminated water supply well in the Power Plant building will be decommissioned. Contaminant degradation in the aquifer media will be monitored using MNA.

The following assumptions were made for implementing this alternative:

- The Point-of-Use system will be operated for 30 years, and O&M costs will be borne by the government.

There are O&M and periodic costs associated with this alternative; the point of use treatment system will require maintenance four times per year in Year 0, and two times per year in Years 1- 30. Long-term monitoring occurs at three year intervals, and sampling results each event will be presented for in a Groundwater Monitoring Report.

2.10 EVALUATION OF SELECTED REMEDY

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. Alternative 7 is the remedy selected for the ACS site. Alternative Water Supply with institutional controls on soils and institutional controls with MNA on the groundwater provides long-term protection to human health and the environment, meets all identified pertinent risk-based regulations, minimizes short-term environmental impacts, and is cost-effective. A detailed analysis of this Selected Remedy is provided below and on Table 3 the Detailed Analysis of Remedial Alternatives Northway ACS FUDs Site.

Threshold Criteria

Overall Protection of Human Health and the Environment

The remedy is protective of human health, the environment and pertinent risk-based regulations. The remedy institutes institutional controls limiting excavation work within the contaminated areas and limiting access to the contaminated aquifer will be put in place. This remedy protects human health by removing the two contaminated wells on the site. The remedy also provides a clean non-contaminated water supply well, eliminates exposure pathways; and protects the environment with the ICs by ensuring the surrounding areas are not affected by contamination in the future. Contaminant degradation in the aquifer media will be monitored using monitored natural attenuation.

Compliance with Pertinent Risk Based Regulations

The primary contaminants of concern at the ACS site are DRO and RRO. Pertinent risk-based regulations 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 and 11,000 mg/kg for RRO to prevent further migration of DRO and RRO.

The primary remedial target is DRO in the groundwater, which is a drinking water source. For the protection of human health the pertinent risk-based regulations include the 18 AAC 75.345 Table C groundwater cleanup levels, which is 1.5 mg/L for DRO and 1.1 mg/L for RRO.

Primary Balancing Criteria

Short-Term Effectiveness

During the drilling and well decommissioning activities there would be an increased potential for exposure to contaminants by site workers performing the remediation work. Potential health effects can be limited with the use of proper personal protective equipment. Controls will be

used to prevent contact with soil cuttings, decommissioned well components and contaminated dust from spreading to other ecological or human receptors. The remedy can be implemented over a short period of time and thus provides short term effectiveness.

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 contaminants and proper implementation of ICs. The implementation of the alternative would be effective in the long term as contaminant concentrations in the soil 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. Soil has been treated by interim removals from 2000-2006. The cleanup has been performed to the maximum extent practicable even though residual petroleum-contaminated soil and groundwater exists on-site. A Treatability Study conducted between 2006 through 2007 showed that *in-situ* bioventing treatment was not a feasible remedial option. Natural biological processes would continue to break down the remaining contamination over time to reduce toxicity. The new alternative water supply well would eliminate the possibility of ingestion of contaminated water.

Implementability

The alternative water supply well and institutional controls has average implementability, however, site logistics are complicated due to the remote nature of water distribution line construction.

Institutional Controls would require instituting notices with two current landowners. 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.

Table 3
Detailed Analysis of Remedial Alternatives
Northway ACS FUDs Site, 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 Probable 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 pertinent regulations for the foreseeable future. (Score = 0)	Readily implemented (Score = 5)	No cost (Score = 7)	12
Remedial Alternative 2 Soil: Institutional Controls Groundwater: Institutional Controls on Aquifer Media Use, 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 groundwater will be allowed to attenuate naturally and will require long-term monitoring. (Score = 0.5)	Does not reduce the toxicity, mobility, or volume of hydrocarbon in the soil or the groundwater aquifer at the site. (Score = 0)	Not effective. Hydrocarbon concentrations in soil and groundwater at the site will exceed pertinent regulations for the foreseeable future. Implementing this alternative will not result in any additional risks to the community or the environment. (Score = 3)	Readily implemented Uncertainties associated with implementing this alternative include • The timeframe for the cleanup of the contaminated aquifer media is unknown. (Score = 4)	$304,286 (Score = 6)	13.5
Remedial Alternative 3 Soil: Removal to Bedrock Groundwater: Alternative Water Supply Well, Institutional Controls on Aquifer Media Use, 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, and in groundwater at the point-of-use by providing petroleum-free potable water to the Spitler residence. Over time will achieve cleanup levels in the aquifer media. (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 = 4)	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. (Score = 4)	Very effective over the short-term. Pertinent regulations in soil onsite would be achieved immediately after removing the contaminated soil. An adequate supply of contaminant-free potable water would be available to the Spitler residence. 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: • Locating the new water supply well within an aquifer that is contaminant-free; and capable of providing an adequate supply of fresh water. • The timeframe for the cleanup of the contaminated aquifer media is unknown. (Score = 1)	$3,371,644 (Score = 1)	15
Remedial Alternative 4 Soil: Removal to 10 feet bgs, ICs on soil > 10 feet bgs Groundwater: Alternative Water Supply Well, Institutional Controls on Aquifer Media Use, 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, and in groundwater at the point-of-use by providing petroleum-free potable water to the Spitler residence. Achieving numerical cleanup levels in subsurface soil and aquifer media will likely take more than 30 years. (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. The responsibility of the water supply well would be turned over to the Spitler residence upon system completion. (Score = 3)	The toxicity and volume of hydrocarbon in the top ten feet of soil will be eliminated, and the toxicity and volume of hydrocarbon in the contaminated aquifer will eventually be reduced. (Score = 3)	Effective over the short-term. Pertinent regulations for the upper ten feet of soil would be achieved immediately after removing the contaminated soil and placing ICs on the subsurface soil. An adequate supply of contaminant-free potable water would be available to the Spitler residence. 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: • Locating the new water supply well within an aquifer that is contaminant-free; and capable of providing an adequate supply of fresh water. • The timeframe for the cleanup of the contaminated aquifer media is unknown. (Score = 2)	$1,923,861 (Score = 3)	15
Remedial Alternative 5 Soil: Removal to bedrock	Will protect human health and the environment by eliminating exposure to	Will achieve pertinent regulations for hydrocarbons in soil. Will achieve pertinent regulations for groundwater at the point-of-use by	Removing and treating the contaminated soil is both effective and permanent. Hydrocarbons in groundwater will be allowed to	The toxicity and volume of hydrocarbon in the soil will be reduced, and the toxicity and volume	Very effective over the short-term. Pertinent regulations in soil onsite would be achieved immediately after removing the contaminated soil. An	Readily implemented. Point-of-Use system must be maintained.	$3,386,672 (Score = 0)	13.5

Table 3
Detailed Analysis of Remedial Alternatives
Northway ACS FUDs Site, 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 Probable Cost	NCP Evaluation Criteria Total Score
Groundwater: Point-of-Use Treatment, Institutional Controls on Aquifer Media Use, with MNA	contaminated groundwater. (Score = Yes)	providing petroleum-free potable water to the Spitler residence. Over time will achieve cleanup levels in the aquifer media. (Score = Yes)	attenuate naturally and will require long-term monitoring. Point-of-Use treatment will require periodic O&M. (Score = 3.5)	of hydrocarbon in the contaminated aquifer will eventually be reduced. (Score = 4)	adequate supply of contaminant-free potable water would be available to the Spitler residence. Implementing this alternative will not result in any additional risks to the community or the environment. (Score = 4.5)	(Score = 1.5)		
Remedial Alternative 6 Soil: Removal to 10 feet bgs Groundwater: Point-of-Use Treatment, Institutional Controls on Aquifer Media Use, with MNA	Will protect human health and the environment by eliminating exposure to contaminated groundwater. (Score = Yes)	Will achieve pertinent regulations for hydrocarbons in soil within typical excavation depths. Will achieve pertinent regulations for groundwater at the point-of-use by providing petroleum-free potable water to the Spitler residence. Achieving numerical cleanup levels in subsurface soil and aquifer media will likely take more than 30 years. (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. Point-of-Use treatment will require periodic O&M. (Score = 2.5)	The toxicity and volume of hydrocarbon in the top ten feet of the soil will be eliminated, and the toxicity and volume of hydrocarbon in the contaminated aquifer will eventually be reduced. (Score = 3)	Effective over the short-term. Pertinent regulations for the upper ten feet of soil would be achieved immediately after removing the contaminated soil, and placing ICs on the subsurface soil. An adequate supply of contaminant-free potable water would be available to the Spitler residence. Implementing this alternative will not result in any additional risks to the community or the environment. (Score = 3.5)	Readily implemented. Point-of-Use system must be maintained. (Score = 2.5)	$1,938,888 (Score = 2)	13.5
Remedial Alternative 7 . Soil: No Removal, Institutional Controls Groundwater: Alternative Water Supply Well, Institutional Controls on Aquifer Media Use, with MNA	Will protect human health and the environment by eliminating exposure to contaminated groundwater. (Score = Yes)	Will not achieve the numeric soil cleanup level for the protection of groundwater; groundwater from the contaminated aquifer would not be used. The Spitler residence will be provided an independent potable water supply, and by instituting institutional controls on both the contaminated soil and groundwater aquifer, pertinent regulations will be met. Achieving numerical cleanup levels in soil and aquifer media will likely take more than 30 years. (Score = Yes)	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, which may take more than 30 years for the aquifer media to achieve cleanup levels, and will require long-term monitoring. (Score = 2)	Does not reduce the toxicity, mobility, or volume of hydrocarbon in the soil or the groundwater aquifer at the site. (Score = 0)	Effective over the short-term. While the numeric cleanup levels for soil and groundwater onsite would not be achieved within the short term, an adequate supply of contaminant-free potable water would be available to the Spitler residence. 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: • Locating the new water supply well within an aquifer that is contaminant-free; and capable of providing an adequate supply of fresh water. • The timeframe for the cleanup of the contaminated aquifer media is unknown. (Score = 3)	$559,839 (Score = 5)	13.0
Remedial Alternative 8 Soil: No Removal, Institutional Controls Groundwater: Point-of-Use Treatment, Institutional Controls on Aquifer Media Use, with MNA	Will protect human health and the environment by eliminating exposure to contaminated groundwater. (Score = Yes)	Will not achieve the numeric soil cleanup level for the protection of groundwater; groundwater from the contaminated aquifer would not be used. This remedy will achieve pertinent regulations for groundwater at the point-of-use by providing petroleum-free potable water to the Spitler residence. pertinent regulations will be met. Achieving numerical cleanup levels in soil and aquifer media will likely take more than 30 years. (Score = Yes)	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, which may take more than 30 years for the aquifer media to achieve cleanup levels, and will require long-term monitoring. Point-of-Use treatment will require periodic O&M. (Score = 1)	Does not reduce the toxicity, mobility, or volume of hydrocarbon in the soil or the groundwater aquifer at the site. (Score = 0)	Effective over the short-term. While the numeric cleanup levels for soil and groundwater onsite would not be achieved within the short term, an adequate supply of contaminant-free potable water would be available to the Spitler residence. Implementing this alternative will not result in any additional risks to the community or the environment. (Score = 3)	Readily implemented. Point-of-Use system must be maintained. (Score = 3.5)	$574,867 (Score = 4)	11.5

Cost

A cost estimate for the implementation of Alternative 7 is shown in Table 4. The costs include implementing the ICs, decommissioning of wells, installing a new water system and the sampling and analysis to monitor the natural attenuation of the contamination in the groundwater. Costs were based on best professional judgment and experience from previous Northway site work. The costs assume site work occurs in the summer and include: planning, equipment mobilization/demobilization, construction of distribution water lines, groundwater sampling, and final reports.

Table 4. Estimated Cost of Selected Remedy

Phase	Cost
Institutional Controls (soil)	$20,000
General (site preparation, facilities)	$91,000
Project Management/Planning	$85,000
Mobilization/demobilization	$47,000
Decommission two wells	$22,500
Well installation and water line	$97,500
MNA for 30 years	$178,000
Institutional Controls (groundwater)	$20,000
Total Present Worth	**$560,000**

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 agrees the selected remedy is in compliance with state law and regulation.

Community Acceptance

A proposed plan (PP) was presented to the community of Northway in September 2011. No comments were received from community members from the meeting.

The property owners, Spitler estate, Naabia Niign LTD and USACE held a teleconference in August 2011 to discuss the upcoming community meeting regarding the proposed plan. Spitler estate representative, Diane Cronk sent a letter to USACE dated August 4, 2011 and is presented in Part 4. Lorraine Titus, President of NNI and Naabia Niign LTD sent a letter to USACE dated August 10, 2011 regarding the proposed plan for the ACS site and is presented in Part 4. The USACE response letters dated February 22, 2012 to the two property owners are also presented in Part 4.

2.11 SELECTED REMEDY

The selected remedy is alternative 7, institutional controls limiting excavation work and groundwater use within the contaminated areas; a new, deep, water supply system installed outside the known contaminant plume.

2.11.1 Summary of Rationale for the Selected Remedy

Based on the information available, USACE believes that the selected remedial action will protect human health and the environment, comply with cleanup requirements, be cost-effective, and utilize permanent solutions.

There are no short-term threats associated with the selected remedy that cannot be readily controlled. Land and groundwater use will be restricted by institutional controls after completion of the remedial action (decommissioning of wells and installation of new well).

2.11.2 Description of Selected Remedy

The selected remedial action for the Northway ACS Site is implementation of the institutional controls limiting excavation work within the contaminated areas; a new, deep, water supply system will be installed outside the known contaminant plume, and will provide potable water to the Spitler residence. Contaminant degradation in the aquifer media will be monitored using monitored natural attenuation.

The institutional controls will both educate the landowners and inform the public. Section 2.11.5 presents additional details on the ICs. Signs may be posted on the property, if requested by the landowner(s), stating the requirement to notify ADEC and obtain approval prior to moving contaminated soil off-site or using, or pumping and discharging, contaminated groundwater. Natural attenuation will continue to reduce the petroleum contamination over time. The long-term monitoring will verify whether the concentrations are decreasing. The Naabia Niign LTD. and the Spitler estate are the current landowners and have provided concurrence with the selected remedial actions. The USACE will submit reports to ADEC at least every three years documenting the groundwater and IC monitoring results. The landowner(s) 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.

2.11.3 Compliance of Selected Remedy with Pertinent Risk Based 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 Northway ACS 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 remedial alternative is $560,000. The costs include planning, equipment mobilization/demobilization, decommissioning of two contaminated wells, installation of new upgradient water supply well, construction of arctic water distribution lines with heat trace, operation of a remote field camp, field work, community relations, survey, periodic groundwater sampling, execution of soil and groundwater institutional controls and project reporting. Based on anticipated costs and reasonable funding levels, a single mobilization is assumed.

The information in the cost estimate summary table (Table 4 in Section 2.10) 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.

2.11.5 Summary of Institutional Controls

Notices of Environmental Contamination will be recorded with the State of Alaska Recorder's Office (e.g., deed notice) which document 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.

ICs that limit access to the contaminated aquifer will also be put in place. Contaminant degradation in the groundwater would be assessed using monitored natural attenuation. The landowners have agreed to adopt the land use restrictions that are included as part of Remedial Alternative 7. Future landowners would be informed through the deed notice.

In the event that the remaining contaminated soil or groundwater becomes accessible by such manners as:

- building or other structure being removed or decommissioned,
- through some other action that fits the site circumstances,
- other information becomes available which indicates that the site may pose an unacceptable risk to human health, safety, welfare or the environment.

The land owner and/or operator are required under 18 AAC 75.300 to notify ADEC and evaluate the environmental status of the contamination in accordance with applicable laws and regulations; further site characterization and cleanup may be necessary under 18 AAC 75.325.390.

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 landowners 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.

Pursuant to 18 AAC 75.325(i)(1) and (2), ADEC approval is required prior to disposal, as defined in 46.03.900(7), of any soil or groundwater at the site since it has been subject to the cleanup rules found at 18 AAC 75.325-.370. In the event soil or groundwater is disposed of (for example dewatering in support of construction) ADEC may require that the soil and groundwater be characterized and managed following regulations applicable at that time.

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 landowners, 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.

This notice remains in effect until a written determination from ADEC is recorded that states that soil at the site has been shown to meet the most stringent soil cleanup levels in method two of 18 AAC 75.340 and that off-site transportation of soil is not a concern.

2.11.6 Expected Outcomes of the Selected Remedy

After successful implementation of the selected remedy, the Northway ACS Site will have a non-contaminated water well. Protection of human health and the environment would be achieved by removing the contaminated water supply wells and installation of a clean water source. The ICs will prevent risk but will not eliminate the toxicity and mobility of onsite contamination 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, eliminating any potential future exposure risks to human health and the environment.

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. The implementation of the alternative water supply well through natural degradation and the use of ICs will eliminate potential future exposure of contaminated water long as the ICs remain in place.

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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, Jessegua 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.

Northway ACS Proposed Plan

The preferred alternative presented in the proposed plan is institutional controls (IC's) on soil and groundwater with monitored natural attenuation and a clean upgradient alternative water supply well. It was explained that USACE will consider all comments received on the Proposed Plans and suggested that Lorraine coordinate with the Tribal Council and contact USACE and ADEC regarding questions or comments. The Proposed Plan has a 30 day public comment period ending on October 27, 2011.

Lorraine suggested that the ACS Power Plant building be decommissioned along with the Spitler house along with the associated contaminated wells (ACS Power Plan water supply well and the Spitler drinking water well) Lorraine indicated that an alternative water supply well would not be necessary. NNI has sampled the Triplex well and results presented high levels of arsenic, she also believed that the well contained POL contaminants. Results from the monitoring reports were reviewed on groundwater sampling and contaminants levels in the well were below the ADEC cleanup levels. USACE indicated that demolishing the former Power Plant building could possibly be FUDS eligible due to the contaminated well that is located inside the building.

ADEC described to the audience that regardless of whether buildings and wells are decommissioned that IC's for groundwater and soil would be in place at the site. A discussion ensued regarding the restrictions of the IC's if the Trans-Alaska pipeline route was selected through the site. USACE and ADEC explained that construction projects occur frequently on contaminated sites and that it would not prevent the potential pipeline route.

A discussion occurred regarding the alternative presented in the Feasibility Study report and if the more expensive alternatives were not selected could the village receive the difference in cost estimates. USACE explained the FUDs program funding and how and what the money could be spent on. A Northway resident asked what other program or grants are available to the village. USACE responded that the NALEMP program is still currently an option and that the village should contact Gerald Albert for additional information.

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

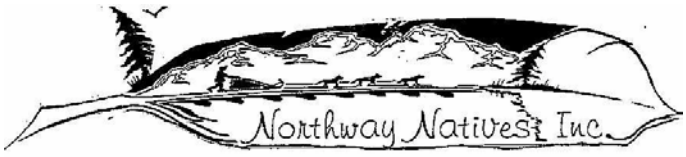
Upon conclusion of the community meeting the administrative record was updated at the Public Library located at the Northway School. Fifteen hard copies of reports dated from 1997 through 2011 and two CD's containing nine electronic reports were delivered to the Northway School. An updated administrative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

PART 4: LANDOWNER CORRESPONDENCE

The following is correspondence from the Spitler estate representative, Diane Cronk, post marked August 4, 2011.

I am writing to address the May 2011 Proposed Plan for the ACS Northway Junction Site. My major concern with Proposed Plan 7 is whether the well will be located on the Spitler property or the NNI property. If not on the Spitler property, and wouldn't that require some sort of agreement with NNI corporation to have it on their property? I am also concerned that the distance of the well from the house could incur extreme costs to keep the well thawed and the water line to the house. Another concern is sharing a well with the corporation which is something that was proposed in the teleconference. How do you determine costs to each landowner? Proposed Plan 8 with an onsite water treatment system raises concerns about costs to the landowner in filters and other supplies. Also, permission from the corporation to cross their land to maintain the system would be needed, right? I have concerns about the Proposed Plans, as well as the deed restrictions that will be imposed. It seems to me that it would be more cost effective for the Army Corp to purchase the property.

Sincerely,
Diane Spitler Cronk
Personal Representative of Don Spitler's Estate



Northway Natives, Inc.
P. O. Box 401
Northway, Alaska 99764-0401 (907) 778-2298 (907) 778-2498 fax

August 10, 2011

David Jadhon
PO Box 6898
JBER, Alaska 99506-0898

RE: Northway Communication System Site Proposed Plan

Dear David:

On July 25th, the board meet, after the teleconference with you regarding the proposed plan for the ACS site.

The board looked at all eight alternatives and the explanation that was given to us. After further discussion, the board came up with another alternative.

1) Demolition of all structures
2) Pay the Corporation for the structures not to exceed the amount listed for alternative 5.

Please let us know if this would be possible.

Sincerely,

Lorraine Titus
President

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
P.O. BOX 6898
JBER, ALASKA 99506-0898

REPLY TO
ATTENTION OF:

22 February 2012

Project Manager

Diane Spitler Cronk
4130 Bull Moose Drive
Wasilla, AK 99654

Dear Ms. Cronk:

Thank you for sharing your concerns regarding the Northway ACS Formerly Used Defense Site (FUDS) Proposed Plan dated June 2011.

Your first concern was the location of the proposed new drinking water. In particular, you mention the well could be located on adjacent property owned by the Northway Natives Incorporated (NNI). If the well is installed outside the Spitler property boundary, the Corps of Engineers will ensure a right-of-way access agreement is put in place between the adjacent property owner and the Spitler property.

Another concern you raised was the unknown distance of a new well from the house and potential extreme costs to keep the well and water line to the house thawed. The Corps of Engineers plans to conduct a long term groundwater source evaluation study before deciding the exact location of the drinking water well. If this evaluation study suggests a well location that is significantly further away from the current well location, a circulation loop design can be implemented which does not require a long term cost to the landowner to heat the water line and thaw the well.

Alternative 8 of the Proposed Plan involves an onsite water treatment system for the existing well (e.g., at the residential tap). You expressed concerns about costs to the landowner such as filters of other supplies. Under this alternative, the operation and maintenance costs would be paid by the government, not the landowner.

You also expressed concerns about sharing a well with the NNI and any allocation of costs. Alternatives 3, 4, and 7 include decommissioning the two existing impacted wells (Spitler and Power Plant) and providing an alternate water source (e.g., a new well). These options assume a new well can be located in an uncontaminated zone within approximately 250 feet of the Spitler residence. The actual location of any proposed new well would be determined during the design phase and is currently unknown. Sharing the well with the NNI is not the USACE intent. If you, as the current property owner, want to share the well with the NNI; it is between the two of you. However, the USACE would require written consent between the landowners to incorporate a distribution line in to the design.

Deed restriction is a notice for current and future property owners about the site conditions. Since contaminated groundwater still remains within the Spitler property; the USACE will put a deed restriction on the property in the office of record to limit installation of any drinking water wells within the contaminated groundwater area. The deed restriction would remain on the property until the groundwater contaminants reaches cleanup levels. USACE will monitor groundwater contaminant levels and natural attenuation parameters at the site every three years until clean up level are achieved.

Finally, you mention that it seems more cost effective for the Corps of Engineers to purchase the property. The goal of the FUDS program is to eliminate risk and restore property to a safe condition. We do not have authorization to expend funds to purchase privately owned property, nor the means to manage the property if acquired. Congress authorizes FUDS funding to perform environmental cleanup at former military sites only. We have requested a review of FUDS policy, but have not received a definitive response.

Please feel free to contact me if you have additional questions at (907) 753-2595 or via email at David.A.Jadhon@usace.army.mil. Thank you.

Sincerely,

David Jadhon
Project Manager

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DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
P.O. BOX 6898
JBER, ALASKA 99506-0898

REPLY TO
ATTENTION OF:

22 February 2012

Project Manager

Lorraine Titus, President
Northway Natives, Inc.
P. O. Box 401
Northway, Alaska 99764-0401

Dear Ms. Titus:

Thank you for sharing your input regarding the Northway ACS Formerly Used Defense Site (FUDS) Proposed Plan.

Your letter requested:

1) Demolition of all structures
2) Pay the Corporation for the structures not to exceed the amount listed for Alternative 5.

The Formerly Used Defense Sites (FUDS) program under which this Northway ACS remediation is taking place has strict eligibility requirements regarding the known and potential contamination or hazards attributable to Department of Defense activities prior to 17 October 1986 on an eligible property. The current project at the Northway ACS site in a hazardous, toxic, or radioactive waste (HTRW) project addressing environmental response actions related to petroleum, oil, lubricants in soil and groundwater which are necessary to protect human health and the environment. We are not authorized to expend funds that do not achieve the site remediation objectives.

Building demolition and debris removal (BD/DR) projects are response actions at an eligible FUDS property to address the demolition and removal of unsafe buildings and structures and the removal of unsafe debris. According to Engineer Regulation (ER) 200-3-1, BD/DR projects are only eligible if all of the following conditions are met:

- *Subsequent to DoD ownership, the property must have always been on lands owned by State, Local Government, or Alaskan Native Corporation.*
- *The conditions must have been hazardous as a result of prior DoD use and must have been inherently hazardous when the property was transferred or disposed of by GSA before 17 October 1986.*
- *Inherently hazardous BD/DR must present a clear danger, likely to cause, or having already caused, death or serious injury to a person exercising ordinary and reasonable care.*

Furthermore, the following activities under the BD/DR category are ineligible at FUDS:

- *Projects where the hazard is a result of neglect by an owner/grantee subsequent to DoD use, regardless of whether the deed or disposal document required the owner/grantee to maintain the property improvements.*
- *Projects involving structures or debris that were altered or beneficially used by owners subsequent to DoD usage.*

You also requested payment in lieu of restoration. Funding from Congress using the environmental restoration-FUDS appropriation is not authorized for reimbursement of current landowners for any response actions initiated or completed with regard to DoD contamination on an eligible FUDS property.

Finally, the preferred remedial alternative in the proposed plan is not based solely on cost. We follow federal guidance which requires remedies to be protective of human health and achieve cleanup levels. Selecting a final remedy considers other balancing criteria such as short/long term effectiveness, implementability, and cost. However, the range of estimated costs for the remedial alternatives evaluated is not a maximum amount available.

Please feel free to contact me if you have additional questions at (907) 753-2595 or via email at David.A.Jadhon@usace.army.mil. Thank you.

Sincerely,

David Jadhon
Project Manager

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PART 5: REFERENCES

Alaska Department of Environmental Conservation (ADEC), 2008. *18 AAC 75; Oil and Other Hazardous Substances Pollution Control.* October 9.

Alaska Department of Environmental Conservation (ADEC) 2003. *Division of Spill Prevention and Response, Contaminated Site Program, Technical Memorandum 01-007, "Additional Cleanup Values"* November 24, 2003.

ADEC. 2005. *Division of Spill Prevention and Response, Contaminated Site Program, Policy Guidance on Developing Conceptual Site Models,* November 30, 2005.

ADEC. 2006. *Oil and Other Hazardous Substances Pollution Control, Regulated by 18 AAC 75,* December 2006.

Fairbanks Environmental Services. (FES). 2006. *Final 2006 Soil Treatability Study Report*, May 2007.

FES. 2008. *Final Northway ACS Feasibility Study Report, FUDS,* September 2008, F10AK017703_04.09_0005_a.

FES. 2011. *Proposed Plan Northway ACS, FUDS,* September 2011, F10AK017703_04.10_0500_a.

Harding, Lawson Associates/Wilder (HLA/Wilder). *1996. Remedial Action Report Northway Alaska Communications System Removal Action, Northway Junction, Alaska. Volumes I and II.* June 19, 1996.

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

USACE. 2005. *Final Contamination Delineation (ROST), Northway Alaska Communication System.* October 2005.