Proposed Plan

Northway Alaska Communications System (ACS)

Formerly Used Defense Site (FUDS)
Northway Junction, Alaska
FUDS #F10AK0177 HTRW Project 03

US Army Corps of Engineers **September 2011**

INTRODUCTION

The United States Army Corps of Engineers (USACE), Alaska District invites the public to review and comment on the Proposed Plan for the Northway Alaska Communications System (ACS), Formerly Used Defense Site (FUDS), Northway Junction, Alaska (Figure 1). This Proposed Plan presents the cleanup alternatives proposed for contaminated soil and groundwater at the Northway ACS Site. The Corps is soliciting comments on the cleanup alternatives and the proposed remedial action presented in this plan.

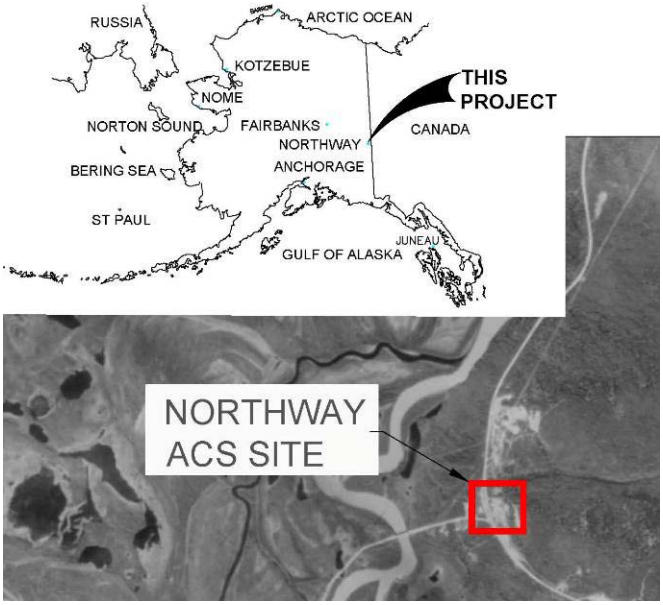

Figure 1 Northway ACS Site Project Location Map

Although the site is not a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) site, this project is being implemented consistent with CERCLA including preparation of this Proposed Plan and the public comment process. Alaska Department of Environmental Conservation (ADEC) is the lead regulatory agency for this site in accordance with and in satisfaction of 18 Alaska Administrative Code (AAC) 75 for release of oil and other hazardous substances.

The Department of Defense (DoD) is authorized to carry out a program of environmental restoration at former military sites pursuant to the Defense Environmental Program (DERP) (10 United States Code 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 were transferred from DoD control prior to 17 October 1986.

The Northway ACS Site is a petroleum, oil, and lubricants (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 will be the basis for the proposed actions described herein.

This Proposed Plan identifies a preferred remedial alternative of institutional controls for soil and groundwater, provision of an alternate water supply well, and monitored natural attenuation of groundwater contamination. However a final selection will not be made until the public comment period ends and all comments are reviewed and addressed. Changes to the proposed approach may be made if public comments or additional information indicate that such changes would result in more appropriate solutions.

This Proposed Plan will provide a brief summary of the history, data, and actions conducted at the Northway ACS Site. Additional details concerning this site are available for review in the documents on file at the Walter Northway School Library. After considering all public comments, USACE will prepare a Decision Document that describes the selected remedy. The Decision Document will include responses to all significant public comments in a section called the Responsiveness Summary.

PURPOSE

The purpose of this Proposed Plan is to:

- Describe the location and history of the site;
- Identify extent of soil and groundwater contamination;

- Summarize site characterization and remedial activities to date;
- Summarize site risks;
- Identify remedial objectives;
- Present remedial alternatives that were considered;
- Summarize the remedial alternative evaluation;
- Present the recommended remedial alternative for the site;
- Request public comment; and
- Provide information on how the public can be involved in the final decision.

SITE LOCATION AND HISTORY

The Northway ACS site is located at Mile 1264 of the Alaska Highway near the junction of the Alaska Highway and the Northway Airport Road and consists of approximately 9.5 acres. The local community, Northway Village, is accessible by road from the Alaska Highway, approximately nine miles southwest of Northway Junction.

The 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 originally included a radio relay building, power plant, family housing quarters, vehicle maintenance garage, an office building, two underground storage tanks (UST), four aboveground storage tanks (AST), aboveground and underground pipelines, overhead and underground utilities.

Figure 2 Northway ACS Site Map

Fuel releases at the Northway ACS Site have resulted in both soil and groundwater contamination. The primary release mechanisms for soil are associated with releases from the former fuel pipeline and valve box.

Currently seven buildings are situated near the Northway ACS site. The buildings include a triplex apartment unit, the former vehicle maintenance building, a privately owned residence and garage, the former power plant building, the former radio relay building, and a building jointly used by the State Troopers and Northway Natives, Inc. (NNI) (as a residential rental). Six of the seven buildings are owned and occupied by NNI. Site features are presented on Figure 2 and property boundaries are shown on Figure 3. The deed to the private residence whose water well has been impacted by contamination is held by the estate of Don Spitler. Currently, the surface estate of the remaining area is owned by NNI and the subsurface estate is owned by Doyon, Limited.

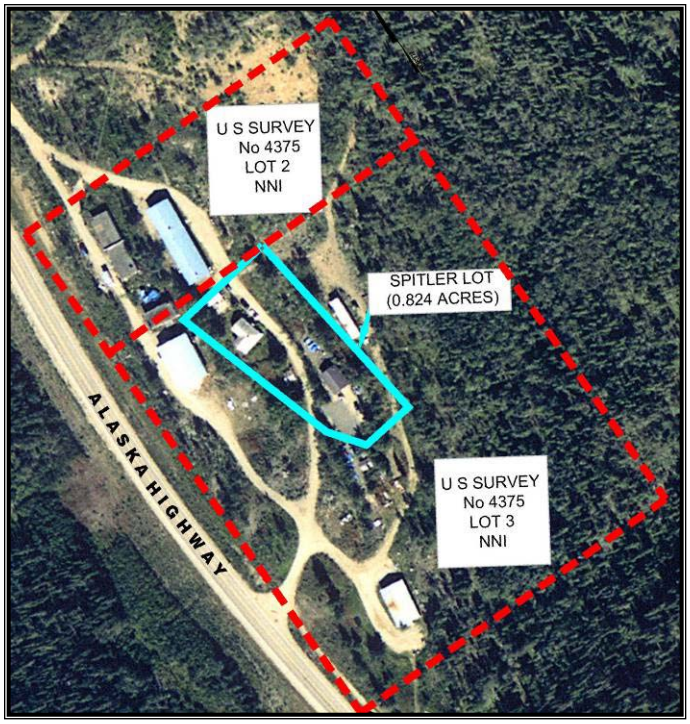

Figure 3 Northway ACS Property Boundaries

There are three domestic water supply wells in the vicinity of the ACS site. One of the wells is currently in use and has not been impacted by site contamination. The Spitler well is not in use due to fuel contamination and since the property is vacant. The Triplex well is also not being used due to operational issues not related to petroleum contamination.

SITE CHARACTERIZATION AND REMEDIAL ACTIVITIES

Site Setting

The Northway ACS Site is located on the northeastern margin of the lowlands formed by the Chisana-Tanana River Valley. This site is located on a hillside along the Alaska Highway. The ACS Power Plant and related facilities were located on a series of benches constructed on the hillside.

Permafrost has been encountered on the southeastern side of the property. Depth to permafrost ranged from 10 to 30 feet below ground surface (bgs) and extended to bedrock. The greatest thickness of permafrost was encountered in soil boring 2006-1 between 27 to 68 feet bgs.

Groundwater at the Northway ACS Site is limited to an unconfined bedrock aquifer. The aquifer resides within fractured and weathered granite-quartzite bedrock. Groundwater elevation measurements have indicated that the predominant groundwater flow direction is towards the southwest. Eight groundwater monitoring wells, three domestic water supply wells and a water supply well at the former power plant exist at the site. Depths of the monitoring and drinking water wells range between approximately 56 to 312 feet bgs. Groundwater depths in the monitoring wells measured during 2010 ranged between 37 and 78 feet bgs.

Summary of Investigations and Remedial Activities

Site Inventory (1985)

The site was inventoried of debris, ASTs and USTs.

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. 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 xlyenes (BTEX) and polynuclear aromatic hydrocarbons (PAH). The Spitler well was the only well sampled that consistently exceeded the ADEC cleanup level for DRO of 1.5 mg/L. No other contaminants exceeded the 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)

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.

Rapid Optical Screening Tool (ROST)

ROST technology sends ultraviolet (UV) light through optical fibers that are strung through hollow direct push steel rods. The light reflects off a tiny mirror within the probe and as the probe is advanced, soil sliding past the window becomes exposed to UV light. Contaminant compounds will fluoresce and the fluorescence response is then analyzed. Hydrocarbon bonds will fluoresce at different wavelengths. These unique patterns are the 'fuel signatures' of the petroleum hydrocarbon within the soil matrix and can be used to differentiate differing petroleum contaminants (such as diesel, gasoline, coal tar, etc).

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 groundater samples from three out of the five wells, and RRO was detected in two out of the five wells at concentrations exceeding the ADEC cleanup levels of 1.5 mg/L and 1.1 mg/L, respectively. The groundwater flow direction appeared to be southwest, in the general direction of the topography. Geochemical and biological activity analyses on groundwater samples demonstrated that contaminant biodegredation was occuring at the site, however the degredation 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 located south of the site, accoss the Alaska Highway was also sampled. Contaminant concentrations were not detected above reporting limits in the Naabia Niign Campground. 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 diminshing recovery rates, product recovery was discontinued.

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 from the sampling program because the well is no longer operational. Contaminant concentrations have remained stable in comparision to earlier sampling events.

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 biodegredation 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 Power Plant building. Significantly higher biodegradation rates were achieved 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.

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. Results of the FS are presented in this Proposed Plan.

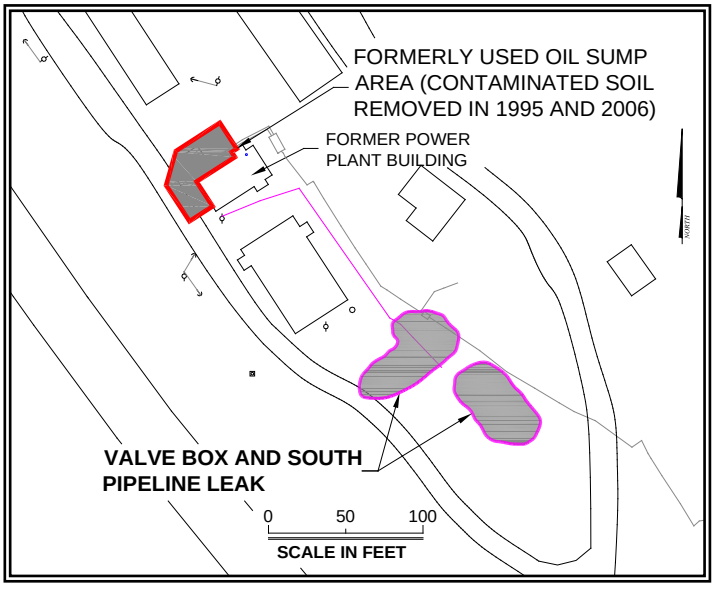

Figure 4 Contaminated Soil Areas

SITE CONTAMINANTS

Extent of Remaining Soil Contamination

The petroleum contamination remaining in soil at the ACS site is associated with two release points along the former pipeline and former used oil sump. The fuel migrated horizontally and vertically through the overburden soil. In both cases, contaminant continued to migrate through the weathered bedrock and into the more competent bedrock below until groundwater was encountered. The locations of the former valve box and former used oil sump are shown on Figure 4.

Former Valve Box and South Pipeline Leaks: The subsurface soils are characterized by areas of contamination separated by areas of non-contaminated soil as presented on Figures 5 and 6. The extent of soil contamination was determined by ROST and soil sampling. The maximum depth of contaminated soil is approximately 18 feet bgs at the Former Valve Box area and approximately 20 feet bgs at the South Pipeline area. The total estimated amount of petroleum contaminated soil is approximately 3,200 cubic yards. The volume of fuel in the bedrock fractures is unknown.

Former Used Oil Sump: Although soil samples have not been collected from beneath the Power Plant building it is probable that petroleum contamination from the used-oil sump extended into the fractured bedrock, and petroleum contaminated soil remains beneath the building. The 1995 and 2006 removal efforts excavated all remaining petroleum contaminated soil near the former power building and sump area to bedrock to the maximum extent possible without undermining the building foundation. The amount of contamination beneath this structure cannot be accurately quantified, but has been estimated at approximately 130 cubic yards. The volume of oil in the bedrock fractures is unknown.

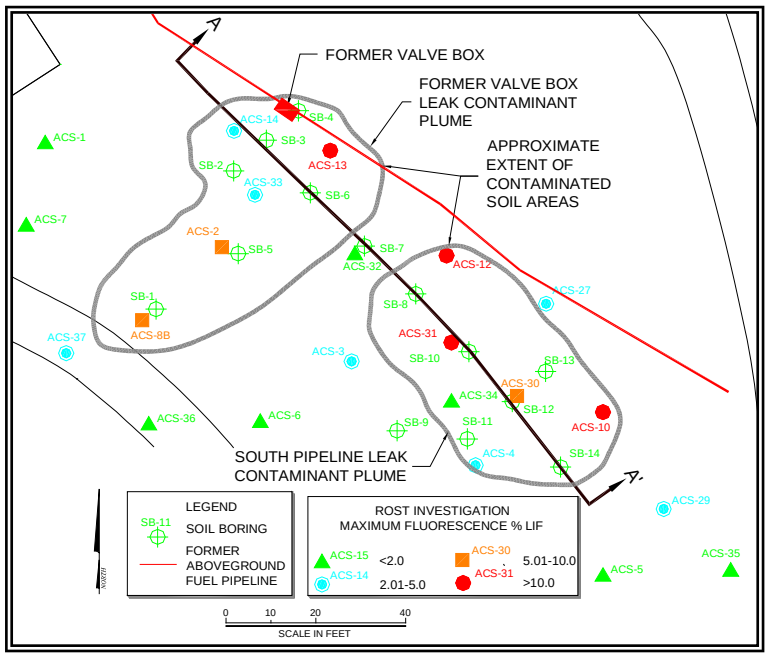

Figure 5 Estimated Extent of Contaminated Soil Associated with the Former Valve Box and South Pipeline Leaks

Laser-Induced Fluorescence (LIF)

Maximum percentage of LIF provides a relative comparison of contaminant concentrations across the site. LIF is typically used as a screening tool for rapid site characterization. Higher LIF percentage generally corresponds to higher contaminant concentrations.

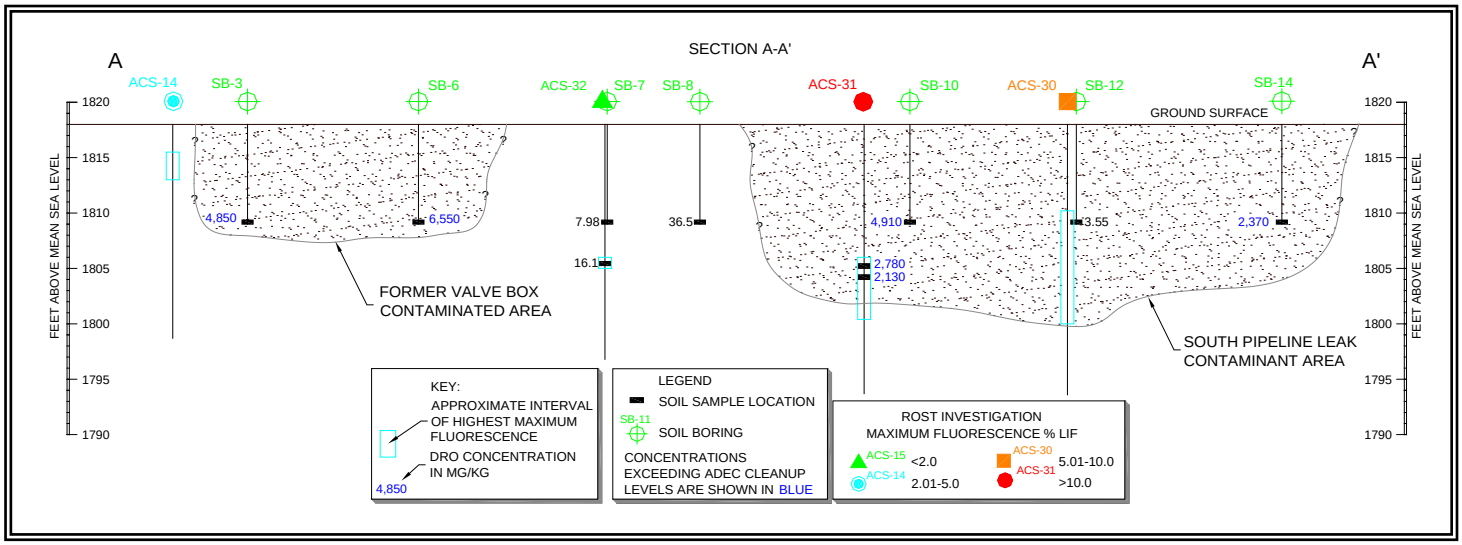

Figure 6 Cross-Sectional View of Remaining Contaminated Soil Associated with the Former Valve Box and South Pipeline Leaks

Extent of Groundwater Contamination

The contaminated groundwater plume is relatively well delineated and covers approximately 120,000 square feet. A domestic water supply well and the former water supply well for the ACS power plant are located within the contaminated groundwater plume.

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 the near future.

The down-gradient well at the Naabia Niign Campground located approximately 1,200 feet from the ACS site was sampled once in 2006 to determine if the well had been impacted by the ACS contaminant plume. Contaminants were not detected in the Naabia well, indicating the contaminant plume does not extend to the Naabia well. The Triplex and Trooper water wells are also outside of the extent of groundwater contamination.

DRO concentrations continue to exceed ADEC cleanup level of 1.5 mg/L in five wells downgradient from the ACS Power Plant Building. The highest 2010 DRO concentration was 5.24 mg/L. Wells with DRO concentrations exceeding the ADEC cleanup level have either stable or decreasing trends. In 2010 RRO was detected in three wells at concentrations that exceeded the ADEC cleanup level of 1.1 mg/L. No other contaminant has been detected above State cleanup levels.

Measurable product is occasionally detected in the Power Plant well and well 2006-03, typically during the periods of low water levels. Product was not detected during the 2010 groundwater sampling event.

Figure 7 presents the 2010 DRO concentration contours (shown in blue) and the 2010 RRO concentrations contours (shown in red) that exceed the ADEC cleanup levels of 1.5 mg/L and 1.1 mg/L respectively.

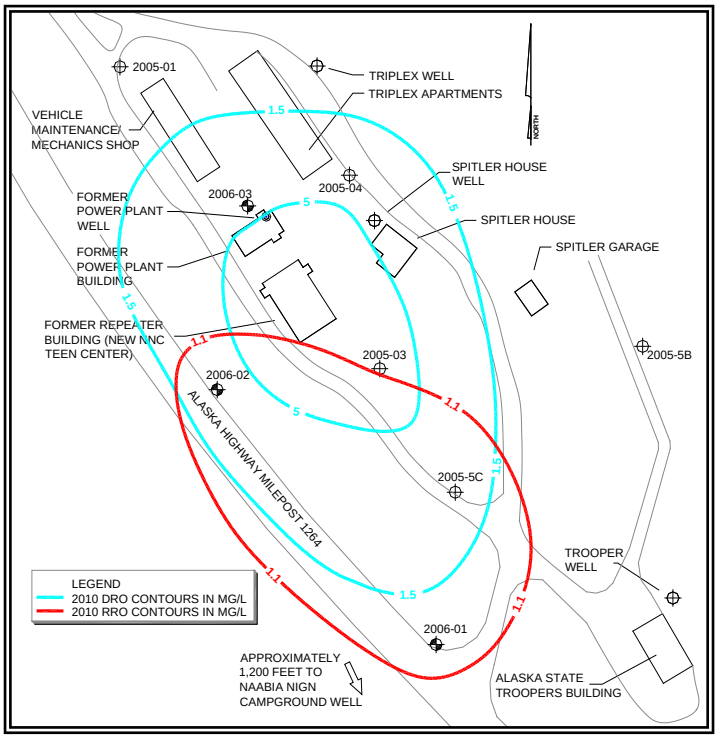

Figure 7 Contaminated Groundwater Plume at Northway ACS

SUMMARY OF SITE RISKS

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, and through soil or groundwater into the air.

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 pathway was dismissed since the primary contaminants of concern (DRO and RRO) at the Northway ACS site are non-volatile.

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 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 there not related ecological risks.

Potential Future Land Use Restrictions

There are currently two landowners at the ACS site; NNI and the Spitler estate. The deed to the private residence is held by the Spitler estate. The Spitler property is currently unoccupied and for sale. NNI and the Spitler estate have agreed to adopt the land use restrictions associated with the institutional controls that are included in several of the recommended remedial alternatives. The land use restrictions prevent use of contaminated groundwater at the site.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives are goals the remedial alternatives are designed to achieve to be protective of human health and the environment. Protectiveness may be achieved by reducing exposure to the contaminated media, as well as through reduction of contaminant concentrations. Specifically, the objectives are to reduce contaminant levels to below ADEC cleanup levels and prevent human exposure to contaminated soil and groundwater above ADEC cleanup levels.

The cleanup objectives for the Northway ACS Site are established to be protective of human health and the environment, and to comply with Federal, State and local laws and regulations.

Groundwater at the site is used as a domestic drinking water source; therefore the remedial alternative must reduce or eliminate potential for contact with the contaminated media. The EPA provides clear guidance (EPA 1988a) for contaminated groundwater that is a current (or potential) drinking water source. The remedial alternatives evaluated for sites with a contaminated drinking water aquifer must include an alternative designed to achieve the groundwater cleanup levels throughout the affected area within the shortest technically feasible timeframe.

As part of the remedial investigation process, the levels of contaminants are compared to State cleanup criteria. ADEC regulates the cleanup of contaminated sites and has established soil and groundwater cleanup levels in Title 18 of the Alaska Administrative Code, Chapter 75 (18 AAC 75).

Soil

18 AAC 75 specifies different soil cleanup levels depending upon the applicable exposure pathway. For petroleum hydrocarbons there are three categories; ingestion, inhalation, and migration to groundwater. Soil contaminant concentrations exceed only the migration to groundwater criteria at the ACS site.

The Method Two soil 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.

Groundwater

DRO is the primary contaminant of concern in groundwater. RRO also been detected above cleanup levels in three wells. The 18 AAC 75 Table C groundwater cleanup levels for DRO and RRO are 1.5 mg/L and 1.1 mg/L, respectively.

Cleanup Goals for the Northway ACS Site are presented in the following table.

Table 1 Cleanup Goals for Contaminants of Concern

Contaminants of Concern	Soil Cleanup Goals	Groundwater Cleanup Goal
Diesel Range Organics (DRO)	250 mg/kg	1.5 mg/L
Residual Range Organics (RRO)	11,000 mg/kg	1.1 mg/L

REMEDIAL ALTERNATIVES

Soil and groundwater treatment technologies were combined to create eight remedial alternatives as presented in the 2008 FS. These alternatives were further evaluated against United States Environmental Protection Agency (EPA) guidance criteria and were ranked appropriately. The remedial action alternatives are analyzed using the evaluation criteria outlined in the EPA's National Contingency Plan (NCP). Each alternative is evaluated relative to the others based on the nine criteria.

Alternative 1. No Action

This alternative involves no action or costs at the site; it 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.

Alternative 2. Soil: Institutional Controls; Groundwater: Institutional Controls with MNA

In Alternative 2 the contaminated soil will be left in place, and institutional controls (ICs) will be implemented that limit excavation work within the contaminated areas. ICs that limit access to groundwater within the contaminated aquifer will also be put in place. Contaminant degradation in the groundwater would be evaluated using monitored natural attenuation (MNA) until RAOs are achieved or ADEC and USACE agree that further monitoring no longer necessary.

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

- ICs would include deed notices documenting the areas impacted by residual petroleum, a limitation on installing new water wells, and the requirement to obtain DEC approval prior to moving contaminated soil or groundwater off-site. ICs would also include the provision of appropriate signage and public notifications.
- IC inspections and reporting would continue until RAOs are met or throughout the 30 year timeframe, after which the remedy would be re-evaluated.
- Groundwater monitoring would be conducted at three year intervals for 30 years.

The total estimated present worth cost of Alternative 2 is $304,000. There are no operations and maintenance (O&M) or periodic costs associated with this alternative. Long-term monitoring costs occur at years 0 through 30, at three year intervals, and sampling results from each event will be presented in a Groundwater Monitoring Report.

Institutional Controls (ICs)
ICs limit human exposure to the contaminated soil and groundwater. The types of ICs appropriate to this site include signs and deed restrictions preventing excavation, documenting the areas impacted by residual petroleum, limiting the installation of new water wells, and the requirement to obtain DEC approval prior to moving contaminated soil or groundwater off-site. ICs are often used in combination with other general response actions. Routine inspection, monitoring and reporting are conducted to verify the ICs are being maintained and are effective. Signs inform the public of the site contamination, identify the limitations on excavation and well installation, and provide contact information for additional site details.

Monitored Natural Attenuation (MNA)
Natural attenuation consists of naturally occurring destructive and non-destructive processes that act to reduce dissolved contaminant concentration in groundwater. Biologic activity is the primary destructive process. For hydrocarbon contamination, both aerobic and anaerobic biological processes are important degradation mechanisms.

Alternative 3. Soil: Removal of Contaminated Soil to bedrock/Off-site Treatment (LTTD); Groundwater: Alternative Water Supply and Institutional Controls with MNA

In Alternative 3, all contaminated soil will be excavated and thermally treated at an off-site Low Temperature Thermal Desorption (LTTD) facility. A new domestic drinking water source will be installed outside the known contaminant plume, and the distribution system will provide potable water to the Spitler residence. ICs limiting future access to the contaminated aquifer will be put in place, and the two contaminated water supply wells (Spitler and Power Plant) will be decommissioned. Contaminant degradation in the groundwater would be evaluated using MNA until RAOs are achieved or ADEC and the Corps agree that further monitoring no longer necessary. .

The following assumptions were made in estimating the cost 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.
- Maintenance of the new water system serving the Spitler residence is turned over to the landowner following installation.
- ICs would include deed notices documenting the areas impacted by residual petroleum, a limitation on installing new water wells, and the requirement to obtain DEC approval prior to moving contaminated soil or groundwater off-site. ICs would also include the provision of appropriate signage and public notifications.
- Groundwater monitoring would be conducted at three year intervals for 30 years.

The total estimated present worth cost of Alternative 3 is $3,372,000. There are no O&M or periodic costs associated with this alternative. Long-term monitoring costs occur years 0 through 30, at three year intervals, and sampling results from each event will be presented in a Groundwater Monitoring Report.

Alternative 4. Soil: Removal of Contaminated Soil to 10 feet bgs/Off-site Treatment (LTTD); Groundwater: Alternative Water Supply and Institutional Controls with MNA

In Alternative 4 the contaminated soil originating from the pipeline leaks will be excavated to a depth of 10 feet which will allow future excavation and site development to be conducted with less concern over soil characterization and management. Treatment of the contaminated soil will be off-site LTTD. A new domestic drinking water source 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) will be decommissioned. Contaminant degradation in the groundwater will be evaluated using MNA until RAOs are achieved or ADEC and the Corps agree that further monitoring no longer necessary.

The following assumptions were made in estimating the cost 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.
- Maintenance of the new water system serving the Spitler residence is turned over to the landowner following installation.
- ICs would include deed notices documenting the areas impacted by residual petroleum, a limitation on installing new water wells, and the requirement to obtain DEC approval prior to moving contaminated soil or groundwater off-site. ICs would also include the provision of appropriate signage and public notifications.
- Groundwater monitoring would be conducted at three year intervals for 30 years.

The total estimated present worth cost of Alternative 4 is $1,924,000. There are no O&M or periodic costs associated with this alternative. Long-term monitoring costs occur years 0 through 30, at three year intervals, and sampling results from each event will be presented in a Groundwater Monitoring Report.

Alternative 5. Soil: Removal of Soil to Bedrock/Off-site Treatment (LTTD); Groundwater: Point-of-Use Treatment, Institutional Controls with MNA

In Alternative 5 the contaminated soil 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 groundwater would be evaluated using MNA until RAOs are achieved or ADEC and the Corps agree that further monitoring no longer necessary.

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

- The average depth to bedrock in the two contaminated soil areas was considered to be 22 feet bgs.
- The Point-of-Use system will be operated for 30 years, and O&M costs will be borne by the government.
- ICs would include deed notices documenting the areas impacted by residual petroleum, a limitation on installing new water wells, and the requirement to obtain DEC approval prior to moving contaminated soil or groundwater off-site. ICs would also include the provision of appropriate signage and public notifications.
- Groundwater monitoring would be conducted at three year intervals for 30 years.

The total estimated present worth cost of Alternative 5 is $3,387,000. Capital costs occur in year 0. 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 costs occur Years 0 through 30, at three year intervals, and sampling results from each event will be presented in a Groundwater Monitoring Report.

Remedial Alternative Development
The following discusses the treatment technology options that were included in the remedial alternatives.

Institutional Controls for Soil *– This would involve instituting deed restrictions for future use of the site and erecting signage to identify the site hazards.*

Institutional Controls for Groundwater with MNA *–Deed restrictions for use of groundwater at the site would be instituted. Groundwater monitoring would be conducted periodically to evaluate natural attenuation at the site.*

Removal of Contaminated Soil to Bedrock/Off-site Treatment (LTTD) *Contaminated soil would be excavated to Bedrock and transported off-site for thermal treatment.*

Removal of Contaminated Soil to 10 feet bgs/Off-site Treatment (LTTD) *– This soil treatment option would excavate contaminated soil plumes to a depth of 10 feet bgs and transported off-site for thermal treatment.*

Alternative Water Supply- *This would provide a potable water supply for up to 5 residences. The new well would be located upgradient of the contaminant plume.*

Point-of-Use Treatment – *This would involve Liquid Phase Carbon Adsorption (DRO) and Liquid Phase Synthetic Resin/ion exchange (pretreatment for Iron).*

Alternative 6. Soil: Removal of Contaminated Soil to 10 feet bgs/Off-site Treatment (LTTD); Groundwater: Point-of-Use Treatment, Institutional Controls with MNA

In Alternative 6 the contaminated soil 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 groundwater would be evaluated using MNA until RAOs are achieved or ADEC and the Corps agree that further monitoring no longer necessary.

The following assumptions were made in estimating the cost for implementing this alternative. Excavation and ICs assumptions are the same as the Alternative 3 assumptions:

- Removing and replacing contaminated soil to a depth of 10 feet will allow future site use/development.
- The Point-of-Use system will be operated for 30 years, and the O&M costs will be borne by the government.
- ICs would include deed notices documenting the areas impacted by residual petroleum, a limitation on installing new water wells, and the requirement to obtain DEC approval prior to moving contaminated soil or groundwater off-site. ICs would also include the provision of appropriate signage and public notifications.
- Groundwater monitoring would be conducted at three year intervals for 30 years.

The total estimated present worth cost of Alternative 6 is $1,939,000. Capital costs occur in Year 0. 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 costs occur Years 0 through 30, at three year intervals, and sampling results from each event will be presented in a Groundwater Monitoring Report.

Alternative 7. Soil: Institutional Controls; Groundwater: Alternative Water Supply and Institutional Controls with MNA

In Alternative 7 the contaminated soil will be left in place, and institutional controls limiting excavation work within the contaminated areas will be instituted. A new domestic drinking water source 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) will be decommissioned. Contaminant degradation in the groundwater will be evaluated using MNA until RAOs are achieved or ADEC and the Corps agree that further monitoring no longer necessary.

The following assumptions were made in estimating the cost 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.
- ICs would include deed restrictions limiting development of the site and preventing usage of groundwater. ICs would also include the provision of appropriate signage and public notifications. The ICs may be removed from the site once cleanup goals are achieved.
- Groundwater monitoring would be conducted at three year intervals for 30 years.

The total estimated present worth cost of Alternative 7 is $560,000. Capital costs occur in Year 0. There are no O&M or periodic costs associated with this alternative. Long-term monitoring costs occur Years 0 through 30, at three year intervals, and sampling results from each event will be presented in a Groundwater Monitoring Report.

Alternative 8. Soil: Institutional Controls; Groundwater: Point-of-Use treatment and Institutional Controls

In Alternative 8 the contaminated soil would be left in place, and IC's limiting excavation work within the contaminated areas would 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 groundwater would be evaluated using MNA until RAOs are achieved or ADEC and the Corps agree that further monitoring no longer necessary.

The following assumptions were made in estimating the cost 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.
- ICs would include deed notices documenting the areas impacted by residual petroleum, a limitation on installing new water wells, and the requirement to obtain DEC approval prior to moving contaminated soil or groundwater off-site. ICs would also include the provision of appropriate signage and public notifications.
- Groundwater monitoring would be conducted at three year intervals for 30 years.

The total estimated present worth cost of Alternative 8 is $575,000. Capital costs occur in Year 0. 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 costs occur years 0 through 30, at three year intervals, and sampling results from each event will be presented in a Groundwater Monitoring Report.

EVALUATION OF REMEDIAL ALTERNATIVES

Remedial action alternatives are developed for the site and discussed in detail in the Feasibility Study. The Feasibility Study defines remedial action objectives, volume of impacted media to be addressed, and potential methods for addressing the impacted area. Table 2 provides a summary of remedial action alternative evaluation.

Table 2 - Remedial Alternative Evaluation Criteria

Criteria Type	Evaluation Criteria	Definition
Threshold Criteria	Protective of human health and the environment	Protection of both human health and the environment is achieved through the elimination, reduction, or control of exposures to contaminated media. All migration pathways must be addressed.
	Compliance with Cleanup Levels	Attainment cleanup levels under federal environmental laws and state environmental of facility siting laws, or provide grounds for invoking applicable waivers.
Balancing Criteria	Long-term effectiveness and permanence	Protects human health and the environment after the remedial objectives have been met.
	Reduction in toxicity, mobility, or volume through treatment	The degree to which recycling or treatment reduces the toxicity, mobility, or volume of the contaminated media.
	Short-term effectiveness	Protects human health and the environment during construction and implementation. Degree of threat and the time period to achieve Remedial Action Objectives (RAOs) are also considered.
	Implementability	The ease or difficulty of implementing the alternative. Considers technical and administrative feasibility as well as the availability of services and materials.
	Cost	Costs include design, construction, startup, and present-worth costs for long-term monitoring and maintenance. Accuracy to within –30% and +50% (EPA, 2000).
Modifying Criteria	State Acceptance	The state's position and key concerns related to the preferred alternatives.
	Community Acceptance	The community's preferences for or concerns about alternatives.

These alternatives were evaluated against United States EPA guidance criteria and were ranked appropriately. The remedial action alternatives are analyzed using the evaluation criteria outlined in the EPA's NCP and a preferred alternative was identified. Each alternative was evaluated relative to the others based on the nine NCP criteria.

Table 3 summarizes the NCP scores for each of the alternatives. Alternatives 3, 4, 5 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 7 as it represents the best value based upon its high relative score and lower cost compared to the other high scoring alternatives. An important consideration in the selection of the preferred alternative is the water supply for the Spitler property. Currently the property is unoccupied and is for sale. Section 5 of the Final 2008 Feasibility Study presents additional details on the NCP scoring evaluation. The NCP scoring evaluation is summarized in Table 3 on the following page.

Table 3 - Summary of Northway ACS Site Remedial Alternative Evaluation

Remedial Alternative	Protects Human Health and Environment	Complies with ARARs	Long-term Effectiveness and Permanence	Reduction in Toxicity, Mobility, and Volume Through Treatment	Short-term Effectiveness	Implementability	Cost Score	NCP Evaluation Criteria Total Score	Estimated Present Worth (in thousands)
Alternative 1 **Soil** No Action **Groundwater** No Action	No	No	0	0	0	5	7	12	$0
Alternative 2 **Soil**: ICs **Groundwater**: ICs with MNA	Yes	No	0.5	0.5	1	4	6	14	$304
Alternative 3 **Soil**: Removal to Bedrock Off-site Treatment **Groundwater:** Alternative Water Supply Well, ICs with MNA	Yes	Yes	4	4	5	1	1	15	$3,372
Alternative 4 **Soil**: Removal to 10 feet bgs, Off-site Treatment **Groundwater**: Alternative Water Supply Well, ICs with MNA	Yes	Yes	3	3	4	2	3	15	$1,924
Alternative 5 **Soil**: Removal to bedrock, Off-site Treatment **Groundwater**: Point-of-Use Treatment, ICs with MNA	Yes	Yes	3.5	4	4.5	1.5	0	13.5	$3,387
Alternative 6 **Soil**: Removal to 10 feet bgs, Off-site Treatment **Groundwater**: Point-of-Use Treatment, ICs with MNA	Yes	Yes	2.5	3	3.5	2.5	2	13.5	$1,939
Alternative 7 **Soil**: ICs **Groundwater**: Alternative Water Supply Well, ICs with MNA	Yes	Yes	2	0.5	3	3	5	13.5	$560
Alternative 8 **Soil**: ICs **Groundwater**: Point-of-Use Treatment, ICs with MNA	Yes	Yes	1	0.5	2.5	3.5	4	12	$575

PREFERRED ALTERNATIVE

The preferred alternative for the Northway ACS Site is:

Alternative 7. Soil: Institutional Controls; Groundwater: Alternative Water Supply and Institutional Controls with MNA.

In Alternative 7 the contaminated soil will be left in place, and ICs limiting excavation work within the contaminated areas will be instituted. 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 agreed to adopt the land use restrictions that are included as part of Remedial Alternative 7. Future landowners would be informed through the deed restrictions.

The new water supply well would be located in an upgradient area, outside of the contaminated groundwater plume. Natural attenuation will continue to reduce the petroleum contamination over time. Groundwater monitoring would be conducted at three year intervals and until RAOs are achieved or until ADEC and USACE agree that further groundwater monitoring is no longer necessary. For cost estimates purposes, 30 years of groundwater monitoring was assumed. The long-term monitoring will verify that the concentrations are decreasing. The estimated cost to implement Alternative 7 is $556,000.

The landowner(s) agreement to the preferred alternative 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.

The landowner(s) will be requested to implement a deed notice to document areas with residual contamination, and properly manage excavated soil in accordance with 18 AAC 75.325.

USACE will provide, on a five year basis, confirmation of existing land use. The landowner(s) will be requested to

provide immediate notification to ADEC in the event of planned land use change in order to appropriately manage existing residual contamination. These activities collectively comply with 18 AAC 75.375 and shall hereinafter be referred to as "Institutional Controls." This will assist the landowner(s) in managing the land and residual contamination properly in the future.

The need for landowner(s) 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 cleanup levels.

COMMUNITY PARTICIPATION

The public is encouraged to provide comments on any of the alternatives presented in this Proposed Plan for the Northway ACS Site in Northway Junction, Alaska.

The public comment period ends October 27, 2011.

Comments can be submitted to USACE by any of the following methods:

- Mail or email a written comment to the following address.

NAME: **David Jadhon (CEPOA-PM-ESP)**
ADDRESS: **P.O. Box 6898**
CITY, STATE, ZIP **JBER, Alaska 99506-0898**
David.A.Jadhon@usace.army.mil

For your convenience, the last page of this document provides an area for you to write out your comments. The return address has been provided on the back of this page so that it can be folded, stapled, stamped and placed in the mailbox.

- Leave a recorded message by calling:

PHONE NUMBER: **907-753-2595**

- Attending the public meeting

DATE **Tuesday, September 27, 2011**
TIME **2:00 PM**
PLACE **Village of Northway Community Center**

A final decision for the site will be made only after all public comments are considered. USACE will provide a written response to all significant comments. A summary of the responses will accompany the Decision Document and will be made available in the Administrative Record and at the Walter Northway School Library in Northway, Alaska.

ACRONYMS

AAC	Alaska Administrative Code	LTTD	Low Temperature Thermal Desorption
ACS	Alaska Communication System	mg/kg	milligrams per kilogram
ADEC	Alaska Department of Environmental Conservation	mg/L	milligrams per liter
AST	aboveground storage tank	MNA	Monitored natural attenuation
bgs	below ground surface	NCP	National Contingency Plan
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	NNI	Northway Natives, Inc.
DERP	Defense Environmental Program	O&M	Operations and maintenance
DRO	diesel range organics	POL	Petroleum, oils and lubricants
DOD	Department of Defense	PAH	Polynuclear aromatic hydrocarbons
EPA	United States Environmental Protection Agency	RAO	Remedial action objective
FES	Fairbanks Environmental Services	RI	Remedial Investigation
FS	Feasibility Study	ROST	Rapid Optical Screening Tool
ft	Feet	RRO	Residual Range Organics
FUDS	Formerly Used Defense Site	USACE	United States Army Corps of Engineers
IC	Institutional Controls	UST	Underground storage tank
LIF	Laser-induced fluorescence		

GLOSSARY

Administrative Record The legal file of documents upon which any decision regarding contaminated sites is based. It contains site documents, newsletters, the Community Relations Plan, and other supporting documentation that may be used by federal, state, and local government agencies and private parties to determine appropriate actions for each contaminated site.

ADEC Alaska Department of Environmental Conservation. The state of Alaska government agency responsible for environmental quality regulation and enforcement.

EPA United States Environmental Protection Agency

FS Feasibility Study. A study of the results of the remedial investigation to establish criteria for the cleanup and to identify and evaluate cleanup alternatives for a site.

Proposed Plan A document prepared to inform the public about alternatives being considered for cleaning up a contaminated site. It identifies which alternative or alternatives have been proposed as the preferred alternative(s). The document encourages public comment on all alternatives.

Responsiveness Summary A summary of oral and/or written public comments received during a comment period and the responses to those comments.

RI Remedial Investigation. An investigation conducted to determine sufficient information on the nature and extent of contamination at a site necessary to identify cleanup alternatives.

Decision Document Documentation of the selected remedy for a site and the rationale for its selection.

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the remedial alternatives discussed in this Proposed Plan is important to the Corps. Comments provided by the public are valuable in helping the agencies select a final remedy.

If you would like to mail your comments, you may use the space below to prepare your comments. When you are finished, please fold and mail. A return address has been provided on the back of this page for your convenience. Comments must be postmarked by **October 27, 2011**. If you have questions about the comment period, please contact David Jadhon at (907) 753-2595 or by email at David.A.Jadhon@usace.army.mil.

Name _____
Address _____
City _____
State _____ Zip _____

PUBLIC COMMENT SHEET

Fold along dashed lines, staple, stamp, and mail.

Name _____
Address _____
City _____
State _____ Zip _____

PLACE
STAMP
HERE

US Army Corps of Engineers
David Jadhon (CEPOA-PM-ESP)
P.O. Box 6898
JBER, Alaska 99506-0898