



Proposed Plan Air Force Proposes Environmental Restoration Alternatives for Fire Protection Training Area (Site FT001) with Soil and Groundwater Impacts – Public Comments Invited

A. INTRODUCTION

The purpose of this *Proposed Plan* (PP) is to present to the general public and interested stakeholders the preferred remedial alternative for managing potential risks associated with soil and *groundwater* contamination at Fire Protection Training Area (Site FT001) at the Former Galena Forward Operating Location (FOL), Alaska, and to solicit comments on the recommended *remedial alternative*. The PP summarizes information that can be found in greater detail in the *Remedial Investigation* (RI), Supplemental RI and *Feasibility Study* (FS) Reports and other documents contained in the *Administrative Record* (AR) for the site. Italicized words or phrases are defined in the glossary at the end of this document.

Site FT001 is subject to the *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)* process. In accordance with the *Defense Environmental Restoration Program*, the U.S. Air Force (Air Force), representing the Office of the Secretary of Defense, is the CERCLA lead agency responsible for environmental response actions at the Former Galena FOL. The site is not listed on the National Priorities List, and the *Alaska Department of Environmental Conservation (ADEC)* is the lead regulatory support agency. The PP is a document the lead agency (the Air Force) is required to issue to fulfill the requirements of 42 United States Code (U.S.C.) § 9617; CERCLA 117(a) and the *National Contingency Plan* (NCP) Title 40 Code of Federal Regulations (C.F.R.) §300.430(f)(2).

Figure 1 shows where Site FT001 is in the CERCLA process leading up to implementation of a remedy. Both a Remedial Investigation (RI) and a Supplemental RI have been conducted at Site FT001 to determine the types, quantities and extent of contamination, and to develop ways to address contamination at this site. The RI and Supplemental RI found that:

- Surface and subsurface soils are contaminated with *trichloroethene* (TCE) and multiple petroleum related compounds, including *gasoline range organics* (GRO), *diesel range organics* (DRO) and benzene. Contamination is due to spills at the Fire Protection Training Area (FPTA) circle and leaks from drums that may have been stored around the edge of the circle. Other sources of contamination include historical drum

Community Involvement Opportunities

Public comments on this Proposed Plan (PP) will be considered before a final remedy is selected for this site.

Public Comment Period

Through 5:00 p.m., November 28, 2016
The public is encouraged to send written comments regarding information provided in this PP and supporting documents to:

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** All mailed comments must be postmarked by November 28, 2016.

General Questions/Comments may also be referred to the Air Force Public Affairs team at (866) 725-7617 or afcec.pa@us.af.mil.

Public Meeting

Date: October 26, 2016 Time: 7:00 p.m.

The public is encouraged to attend a community meeting to discuss the information presented in this PP. There will be an opportunity to ask questions and provide formal comments during the meeting. Representatives from the Air Force and ADEC will participate. The meeting will be held at the following location:

Larsen Charlie Community Hall,
Galena, AK

Information Repository & Administrative Record (AR)

The Remedial Investigation (RI), Supplemental RI, Risk Assessment, and Feasibility Study can be found in the AR located at:

The Charles Evans Community Library,
Antoski Street (inside Galena High School),
Galena, AK 99741 (907) 656-1205.

All supporting documents can also be found online at: <http://www.afcec.af.mil/Home/BRAC/Galena.aspx> or directly at: <http://afcec.publicadmin-record.us.af.mil/Search.aspx>
To search for supporting documents, select BRAC, select Galena, then enter the referenced AR# into the Full Metadata Search field for easy access. AR numbers for supporting documents can be found at the end of this PP.

storage at the site and leaks from fuel/gas lines at the site. Contamination extends to a depth of approximately 15 feet below ground surface (bgs) over approximately 42,000 square feet, with the exception of benzene contamination, which extends to depths of 46 feet and has impacted approximately 34,000 square feet.

- Groundwater is primarily contaminated with petroleum compounds, especially benzene; however GRO, DRO, toluene, and the CERCLA hazardous substance TCE also exceed *cleanup* levels (CULs). Groundwater is contaminated beneath and downgradient of the FPTA circle. The *plume* extends southeast from the FPTA circle to a depth of approximately 80 feet bgs and is approximately 800 feet long.
- Perfluorinated compounds (PFCs) have been confirmed at Site FT001 above the United States Environmental Protection Agency (USEPA) Health Advisory; however, the nature and extent has not been determined. The proposed remedy addresses contamination identified during the RI which does not include PFCs. PFCs are being addressed under a separate Air Force program for emerging contaminants. Until further information is obtained regarding the nature and extent of PFCs in soil and groundwater at Site FT001, remediation of petroleum hydrocarbons and other contaminants of concern (COCs) at Site FT001 will be conducted under an Interim *Record of Decision* (ROD).

Figure 2 shows the site layout and area of soil and groundwater contamination. In the FS for Site FT001 the following alternatives were evaluated to mitigate risks associated with soil and groundwater contamination at the site:

- **Alternative 1:** No Action
- **Alternative 2:** Apply *monitored natural attenuation* (MNA) to groundwater at the site, add a soil cover and impose land use controls (LUCs)

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to mitigate potential exposures until all CULs are achieved.

- **Alternative 3:** Apply *bioventing* to treat petroleum contaminants in soil. In conjunction with bioventing, design and install a soil cover with plastic sheeting to promote drainage away from the FPTA circle. Use MNA to remediate groundwater and impose LUCs to mitigate potential exposures until all CULs are achieved.



Figure 1 – CERCLA Process

- **Alternative 4:** Apply in situ chemical oxidation (ISCO) to remove TCE and petroleum contaminants from the soil. After applying ISCO, design and install a soil cover to promote drainage away from the FPTA circle. Use MNA to remediate groundwater and impose LUCs to mitigate potential exposures until all CULs are achieved.

The Air Force's preferred alternative for Site FT001 is **Alternative 3** because it will achieve all *Remedial Action Objectives* (RAOs) to protect human health and the environment (see Section F). Alternative 3 is also cost effective and it will achieve *Cleanup Complete* in a shorter timeframe than the other alternatives evaluated.

The protectiveness with regard to PFC contamination will be made when further information is obtained regarding the nature and extent of PFCs in soil and groundwater at Site FT001. Until then, remediation of petroleum hydrocarbons and other COCs at Site FT001 will be conducted under an Interim ROD.

Public input is important to the remedy selection process. New information or opinions the Air Force or ADEC learn during the *public comment period* could result in the selection of remedial actions that differ from the preferred alternative. The Air Force encourages the public to comment on this PP and all alternatives described, or other material in the AR. Comments may be made at the public meeting scheduled for October 26, 2016. Written comments may be submitted until the end of the comment period on November 28, 2016.

A comment sheet is provided as an attachment to this PP. After comments from the public are received and considered, an Interim ROD document will be written. The Interim ROD will include a summary of any comments received during the public review period along with an explanation of how the comments changed the decision that was reached, if applicable. After the Interim ROD is finalized, the remedy will be implemented following completion of the *Remedial Design/Remedial Action Work Plan*.

B. SITE BACKGROUND

B.1 Galena FOL History

The Former Galena FOL was established as an airfield during World War II and most recently served as a forward operating base for the Pacific Air Force's 611th Air Support Group headquartered at Elmendorf Air Force Base, Alaska. The Former Galena FOL was recommended for closure by the Department of Defense (DoD) *Base Closure and Realignment Act* (BRAC) Commission in 2005 and was officially closed September 30, 2008.

Today, the Air Force Civil Engineer Center (AFCEC) manages the environmental cleanup for the Air Force

at the Former Galena FOL. Regulatory support is provided by ADEC.

B.2 Site FT001 History

Site FT001 was used for fire training activities from the late 1950s until 1991. As part of these activities, an aircraft mock-up was covered with fuel, ignited, and extinguished with firefighting chemicals. The aircraft mock-up used in the exercises was reportedly removed during summer 1992. Historical aerial photographs from 1963 to 1978 suggest that drums were stored on the ground around the FPTA circle. An underground fuel pipeline connected to fuel sprayers likely delivered flammable liquids from an aboveground fuel loading zone and fuel valve in the southern portion of Site FT001 (aboveground fill-stand) to the FPTA circle in the northern/central portion of Site FT001 during training exercises. Surface soil in the area is stained black, presumably from the remaining unburned and residual materials.

Approximately 8,000 to 13,000 gallons of fuel were used annually for fire training exercises from the late 1950s through 1985 as reported in the 1993 Site Investigation Report. The 1996 RI Report stated that approximately 300 to 500 gallons of fuel were used per fire, and two fires per training session were typical. Site FT001 was used for fire training exercises approximately once per week from June through November and once per month during April and May. The facility was not used from December through March. This usage schedule suggests that up to 28,000 gallons of fuel may have been used annually for fire training exercises. When the surface soil was not frozen, the FPTA circle was pre-wetted with water before fuel was distributed directly to the ground surface and ignited. In the 1950s and 1960s, some combustible shop wastes (such as aviation gasoline, thinners, paints, and oils) were used. Since the 1960s, fuels used consisted of both clean and contaminated jet-propulsion fuel, grade 4 (JP-4). Fire extinguishing agents used at Site FT001 included protein foam, chlorobromomethane, dry chemicals, halon, and aqueous film forming foam. Some

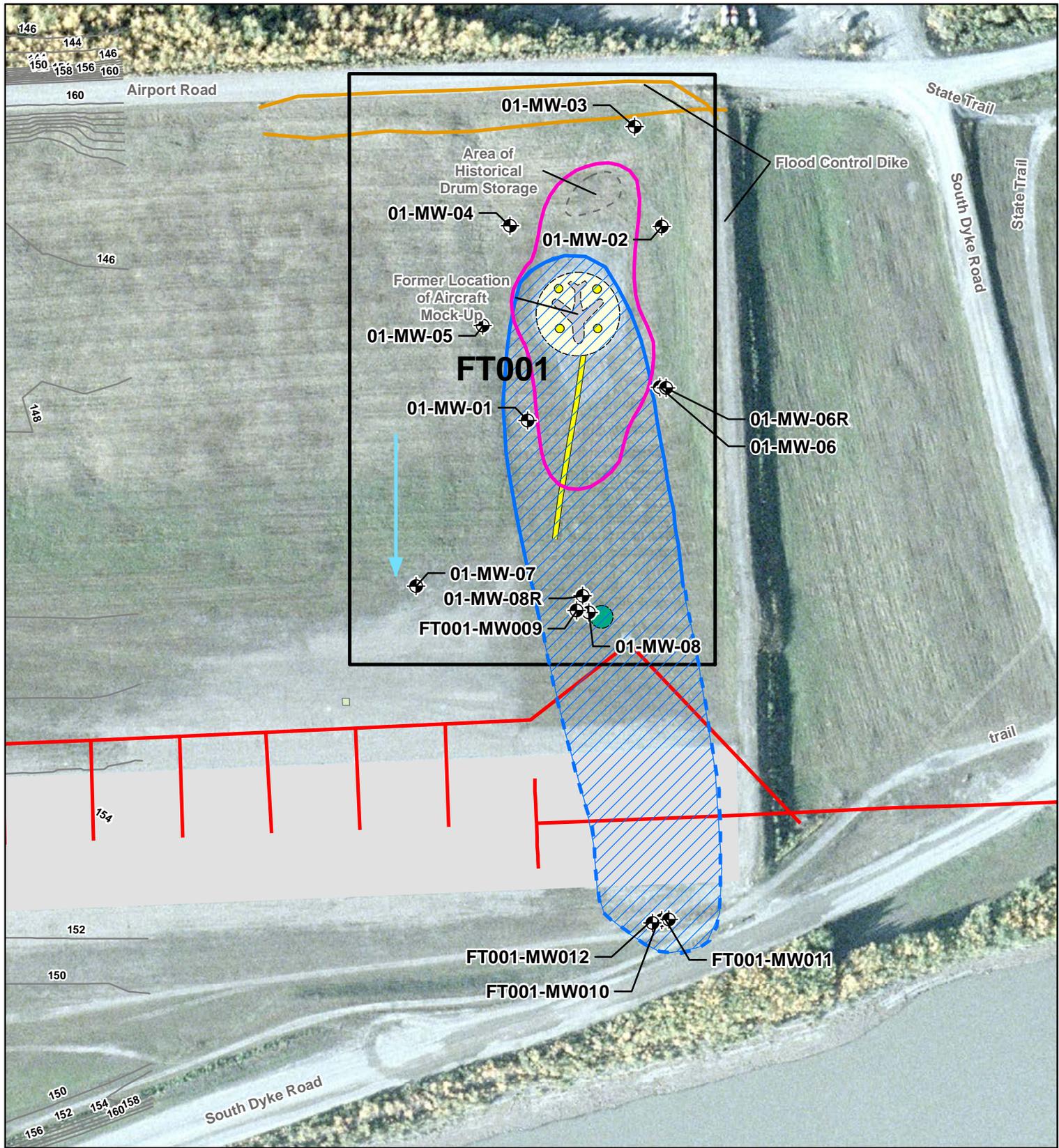
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- Legend**
- FT001
 - Approximate Location of Former Feature
 - Approximate Groundwater Flow Direction
 - Airfield Surface or Road
 - Fire Training Circle
 - Former Fuel Sprayer
 - Formerly Assumed Location of Aboveground Fillstand
 - Underground Electrical Line
 - Ground Surface Contour
 - Monitoring Well
- Utility Locates - 2010**
- Communications Line
 - Fuel/Gas Line
 - Area of Soil Contamination
 - Area of Groundwater Contamination (dashed where inferred)

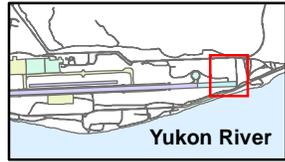
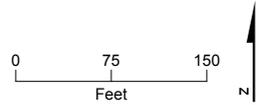


FIGURE 2
Site FT001 Layout and Area of Soil and Groundwater Contamination



Proposed Plan for FT001
 Former Galena Forward Operating Location, Alaska

unburned fuel and firefighting chemicals infiltrated into the soil.

B.3 Previous Public Participation Activities

The Air Force and ADEC, through the Galena Restoration Advisory Board, work with local stakeholders, including the Louden Tribal Council and City of Galena to address any environmental concerns at the Former Galena FOL. The Galena Restoration Advisory Board consists of Air Force and ADEC representatives and government and community stakeholders including the Alaska Department of Transportation, the Bureau of Land Management, US Fish and Wildlife Service, City of Galena, Galena Interior Learning Academy, Louden Tribal Council, Gana-A'Yoo, and private citizens. The Restoration Advisory Board meets twice a year to promote community involvement and disseminate information on the progress of environmental restoration activities.

In an effort to involve the community in the decision-making process, the public is given the opportunity to comment on the Air Force's recommendations through public meetings and review and comment of PPs.

The Air Force also established a community outreach program to notify area residents and interested parties about upcoming meetings, major site activities, and site restoration progress. Periodic newsletters, which are available on the Air Force website (<http://www.afcec.af.mil/Home/BRAC/Galena.aspx>) are published to inform the public about the progress of the environmental cleanup.

C. SITE CHARACTERISTICS

Site FT001 is located on property owned by Alaska Department of Transportation (ADOT), and its boundary encompasses a 0.15 acre, unlined, topographically low-lying region of bare soil/gravel that is centered on the former FPTA circle. Current site activities consist only of periodic mowing. Site FT001 is bounded by the flood control dike to the north and east, the runway overrun to the south, and an open field vegetated primarily by tall grasses to the west. The primary feature of Site FT001 is the former FPTA circle. Snowmelt in the spring forms a seasonal shallow pool in the area of the FPTA circle. This surface water pool remains through most of the summer months and is added to periodically through rainwater runoff from the surrounding area. As a result, soil beneath the FPTA is saturated at the ground surface through much of the summer months and frozen in the winter months. **Figure 3** is a photograph of the Site FT001 area.

Figure 2 shows the estimated area of soil and groundwater contamination at Site FT001 and location of major site features. The primary sources



Figure 3 –Site FT001 Area – View of the former FPTA circle, to the south from Airport Road.

of contamination at Site FT001 are spills at the FPTA circle and leaks from drums that may have been stored around the edge of the circle. Secondary sources of contamination include the former drum storage area and the fuel/gas line, located north and south of the FPTA circle, respectively.

The geology of Site FT001 is dominated by unconsolidated (loose, not rock-like) sediments deposited by the Yukon River to depths of at least 550 feet bgs. The geology at Site FT001 consists of an upper layer that is approximately 25 to 30 feet thick and composed of floodplain deposits consisting of interbedded silts and silty sands. Below the upper layer is a layer composed of river channel material consisting of primarily sands and gravels with some silt that extends to approximately 46 feet bgs. In the downgradient area south of the runway overrun, silt with gravel is present to the depth of approximately 8 feet bgs. Sand with interbedded silt is present from 8 to 23 feet bgs, sand and gravel is present from 23 to 73 feet bgs, and silt is present beneath the gravel to the depth of 80 feet bgs. Permafrost was observed in several soil borings at depths starting at 29 to 39 feet bgs.

Groundwater at Site FT001 exists in an aquifer that consists mainly of interlayered sand and gravelly sand. The aquifer extends to depths greater than 200 feet bgs.

The groundwater flow direction and elevation of the groundwater surface at Site FT001 varies throughout the year because both are dependent on the water level in the Yukon River. From August/September to May, groundwater surface elevations are generally higher in wells farther from the river, and groundwater flows south toward the river. As the water level in the river rises in May, the groundwater surface elevations become higher near the river and groundwater flows to the north, away from the river. The water level in

the Yukon River typically decreases in mid to late June, and groundwater once again flows south toward the river. From mid-June to September, the groundwater surface elevation and flow direction can change often, depending on small fluctuations that occur in river water levels. If the water level in the river increases, groundwater will flow north, away from the river. Similarly, decreases in the river water level cause the groundwater to flow south, toward the river. Groundwater elevation data recorded via data-logging pressure transducers in Site FT001 monitoring wells and the Yukon River during June 1992 show that groundwater fluctuations at Site FT001 coincide more closely to variations in Yukon River stage fluctuations than those at other sites at the Former Galena FOL. This may be the result of the site's proximity to the Yukon River (approximately 800 feet) and a more direct connection between the groundwater and surface water systems.

At Site FT001, ground surface elevations range from approximately 143 to 152 feet above mean sea level. Observed groundwater elevations range from approximately 116 to 138 feet amsl.

C.1 Environmental Investigations

RI field work for Site FT001 was completed in 2010 and 2011, and Supplemental RI field work was completed in 2013, to determine the nature and extent of contamination at Site FT001. Field work consisted of soil sampling, collecting groundwater grab samples, and installing and sampling monitoring wells. Soil samples were collected from "surface soil" (0 to 2 feet bgs), "combined surface and subsurface soil" (0 to 15 feet bgs) and "deep soil" (greater than 15 feet bgs) and analyzed for various contaminants. The most recent base-wide groundwater sampling events, which included sampling at Site FT001, were conducted from 2010 to 2014.

C.2 Soil

Soil samples collected at Site FT001 were analyzed for GRO, DRO, *residual range organics* (RRO), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), pesticides, perfluorinated compounds (PFCs), metals, and dioxins.

Constituents of Concern (COCs) identified in soil are listed in **Table 1** and include GRO, DRO, SVOCs and VOCs. COCs are site-related contaminants that pose an unacceptable risk to human health and/or the environment. COCs are selected based on (1) results of the risk assessment, and (2) comparing concentrations of contaminants to applicable CULs and background threshold values. They are the basis for determining the design of the remedy for a site. Further information on selection of COCs can be found in the FS Report in the AR.

In samples collected from 2010 through 2013, the maximum concentration of each COC exceeded the cleanup level. The maximum concentration of COCs in soil, along with its respective CUL, is presented in **Table 1**.

Table 1. COCs in Soil

COC	Maximum Concentration (mg/kg) ⁽¹⁾			Cleanup Level ⁽³⁾ (mg/kg)
	Surface Soil 0-2 ft bgs ⁽²⁾	Combined Surface and Subsurface Soil 0-15 ft bgs	Deep Soil >15 ft bgs	
Petroleum Contaminants				
DRO	21,000	21,000	NA ⁽⁴⁾	250
GRO	16,400	19,300	NA	300
SVOCs				
1-Methylnaphthalene	40	40	NA	6.2
2-Methylnaphthalene	110	110	NA	6.1
VOCs				
1,2,4-Trimethylbenzene	180	180	NA	23
1,3,5-Trimethylbenzene	59	59	NA	23
Benzene	55	225	0.83	0.025
Ethylbenzene	200	239	NA	6.9
Ethylene Dibromide	NA	1.3	NA	0.00016
Isopropylbenzene	NA	300	NA	62
Naphthalene	57	57	NA	20
Toluene	380	235	NA	6.5
TCE	4	4	NA	0.02
Xylenes, total	1,100	1,100	NA	63

Notes:

⁽¹⁾ mg/kg = milligrams per kilogram

⁽²⁾ ft bgs = feet below ground surface

⁽³⁾ Soil CULs are the lowest applicable levels from ADEC Tables B1 or B2 Method Two CULs (under 40-inch zone) per 18 AAC 75.341, updated October 2008

⁽⁴⁾ NA = not applicable because the chemical was not classified as a COC in this medium

In surface soil and combined surface and subsurface soil, the extent of contamination above CULs is approximately 42,000 square feet and extends to depths of 15 feet bgs. TCE exceeds CULs in an estimated 13,000-square foot area within the footprint of the petroleum-impacted area.

In deep soil, the extent of benzene contamination that exceeds CULs has an estimated area of 34,000

square feet and extends to depths of at least 46 feet bgs.

Soil from the FPTA circle is impacted with PFCs in shallow soil. PFCs are considered “emerging contaminants,” and there are currently no established CULs for PFCs. Delineation of PFCs in soil was not conducted during the RI and Supplemental RI because the Air Force is managing the evaluation of PFCs at Site FT001 under a separate program for emerging contaminants. The remediation of petroleum hydrocarbons and other COCs will be conducted under an Interim ROD.

C.3 Groundwater

Groundwater samples at Site FT001 were analyzed for GRO, DRO, RRO, VOCs, metals, SVOCs, PFCs, PAHs, and PCBs.

COCs for groundwater include benzene, GRO, DRO, toluene, and TCE. Maximum concentration of groundwater COCs from 2010 to 2013 are shown in Table 2.

Table 2. COCs in Groundwater

COC	Maximum Concentration (µg/L) ⁽¹⁾	Cleanup Level ⁽²⁾ (µg/L)
Petroleum Contaminants		
GRO	17,000	2,200
DRO	21,000	1,500
VOCs		
Benzene	12,000	5
Toluene	18,000	1,000
TCE	12	5

Note:

⁽¹⁾ µg/L = micrograms per liter

⁽²⁾ Groundwater CULs are ADEC Table C CULs per 18 AAC 75.345, updated October 2008

The plume in groundwater at Site FT001 is approximately 800 feet long, extends to a depth of approximately 50 feet bgs beneath the FPTA circle and to 80 feet bgs at its downgradient toe, and has an areal extent of approximately 130,000 square feet. The DRO plume in groundwater is estimated to be approximately 12,000 square feet and is limited to the immediate vicinity of the former FPTA circle. TCE impacts to groundwater are also limited in extent and are within the footprint of petroleum contamination.

Concentrations of RRO, SVOCs, PAHs, and PCBs did not exceed the ADEC CULs for groundwater and they are not considered COCs.

The PFCs perfluorooctanoic acid (PFOA) and perfluorooctane sulfate (PFOS) were detected in groundwater during the RI and the Supplemental RI. These constituents are considered to be emerging

contaminants, and there are currently no established CULs for PFCs. The USEPA has established drinking water health advisories for PFOA and PFOS, and both exceeded the advisory level at 5 of the 6 wells sampled during the RI and Supplemental RI. Further evaluation of the extent of PFCs in groundwater was not conducted during the RI and Supplemental RI because the Air Force is managing the evaluation of PFCs at FT001 under a separate program for emerging contaminants. The remediation of petroleum hydrocarbons and other COCs will be conducted under an Interim ROD.

D. SCOPE AND ROLE OF RESPONSE ACTION

The overall cleanup strategy for Site FT001 is to achieve ADEC closure status of “Cleanup Complete”. The proposed response action for Site FT001 addresses all contaminated soil and groundwater and exposure pathways. No *principal threat wastes* are present at Site FT001.

E. SUMMARY OF SITE RISKS

E.1 Human Health Risks

The comparison of contaminant concentrations, in soil and groundwater at Site FT001 to the ADEC Method Two CULs for soil and ADEC Table C CULs for groundwater indicate that there may be unacceptable risks to the following *receptors*:

Future excavation/construction workers: Potential exposure to chemicals in soil, outdoor air and groundwater. Potentially complete routes of exposure to groundwater include incidental ingestion and dermal contact with groundwater.

Current and future occupational workers: Potential exposure to chemicals in surface soil, indoor air and groundwater. Potentially complete routes of exposure to surface soil include inhalation of ambient vapors or dust. Potentially complete routes of exposure to groundwater include ingestion and inhalation of VOCs. *Vapor intrusion* from VOCs in groundwater migrating into future occupational buildings is also a potentially complete exposure route.

Hypothetical future residents: Potential exposure to chemicals in soil, indoor air and groundwater. Potentially complete routes of exposure to soil include incidental soil ingestion, dermal contact, and inhalation of ambient vapors or dust. Potentially complete routes of exposure to groundwater include ingestion, dermal contact, and inhalation of VOCs during showering or other household activities. *Vapor intrusion* from VOCs in groundwater migrating into future residences is also a potentially complete exposure route.

Additional information regarding current and future effects of all contaminants detected at Site FT001 on human health including carcinogenic and non-

carcinogenic risks can be found in the AR in the *Human Health Risk Assessment* completed for Site FT001.

E.2 Ecological Risk

A screening level ecological risk assessment was conducted to evaluate the potential for ecological impacts as a result of potential exposures to chemicals in soil and groundwater at Site FT001.

The area where ecological receptors may be exposed to contaminants at Site FT001 consists of the area inside and surrounding the FTPA circle (**Figure 2**). The area is 0.15 acre, unlined, topographically low-lying region of the bare soil/gravel. Water ponds within the FTPA circle approximately 2 months out of the year, due to snowmelt in the spring. Outside the FTPA circle, the site is vegetated with short grass and forbs. Because the site is adjacent to the runway, the grass is mowed several times a year. The following are general conclusions of the screening-level evaluation of potential risk to ecological receptors from exposure to surface soil, sediment and groundwater at Site FT001:

- For mammals and birds, there is potential for adverse effects for the masked shrew, American robin, least weasel and northern shrike, largely due to assumed exposures to contaminants within the FTPA circle.
- There is potential for adverse effects for plants and invertebrates exposed to contaminants in surface soil and sediment at Site FT001, largely due to assumed exposures to contaminants within the FTPA circle.
- There is potential for adverse effects for receptors (invertebrates and vertebrates) in the Yukon River. If groundwater impacted by Site FT001 discharges to the Yukon River, it may adversely impact the beneficial uses of the river.

While a few individuals may be affected by the high concentrations of contaminants at Site FT001 (especially within the former fire training circle), it is unlikely that populations of any of the ecological receptors evaluated here will be adversely affected.

E.3 Risk Assessment Conclusion

It is the lead agency's current judgement that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of pollutants or contaminants from this site which may present an imminent and substantial endangerment to public health or welfare.

F. REMEDIAL ACTION OBJECTIVES

RAOs are specific goals for protecting human health and the environment from risks and hazards

associated with site-related contamination. RAOs can be accomplished by ensuring people are not exposed to contamination or by reducing concentrations of COCs to levels considered by ADEC to be protective. Specifically, the Air Force proposes the following RAOs for response actions at Site FT001:

RAO 1: Prevent the exposure of human receptors to concentrations of contaminants in soil and groundwater that pose a cumulative *carcinogenic risk* greater than 1 in 100,000 or a cumulative *non-carcinogenic hazard index* greater than 1 across all exposure pathways, in accordance with ADEC cumulative risk standards.

RAO 2: Reduce COC concentrations in groundwater to the ADEC Table C groundwater CULs, listed in Table 2 of this Proposed Plan.

RAO 3: Prevent further degradation of groundwater by reducing concentrations of COCs in soil to levels protective of groundwater quality, as identified in Table 1 of this Proposed Plan.

Based on the RAOs and *Applicable or Relevant and Appropriate Requirements* (ARARs), a number of technologies and approaches were identified and screened using criteria such as effectiveness for achieving RAOs, implementability, and cost.

F.1 Preliminary Remediation Goals

The proposed soil CULs for Site FT001 are the lowest applicable levels for ADEC Tables B1 or B2 Method Two CULs (Under 40-inch Zone) per 18 Alaska Administrative Code (AAC) 75.341. The Air Force may consider calculating alternative CULs using Method Three per 18 AAC 75.340(e) in the future and will follow the CERCLA process to establish any change in the CULs. CULs for human health exposures (i.e., direct contact and outdoor inhalation) will be achieved up to a depth of 15 feet bgs. Migration to Groundwater CULs that are protective of groundwater quality will be achieved at all depths. The proposed groundwater CULs for Site FT001 are ADEC Table C CULs per 18 AAC 75.345. The preliminary remediation goals for soil and groundwater are chemical-specific ARARs for Site FT001.

There are no specific CULs proposed for soil vapor at Site FT001. The potential for future vapor intrusion will be reevaluated in accordance with ADEC's Vapor Intrusion Guidance for Contaminated Sites, or the most current applicable vapor intrusion guidance, upon achievement of the proposed soil and groundwater CULs or if land use changes.

After completing site cleanup, the risk from hazardous substances will be evaluated to ensure it does not exceed an excess cumulative carcinogenic risk standard of 1 in 100,000 or a cumulative non-

carcinogenic hazard index of 1 across all exposure pathways per 18 AAC 75.325(g).

G. SUMMARY OF REMEDIAL ALTERNATIVES

In the Site FT001 FS, *general response actions* that could potentially be implemented to manage risks and treat contaminants at Site FT001 were identified. Specific response actions for each general response action were then identified and screened based on their likely site-specific effectiveness, implementability, and relative cost. The site-specific response actions retained from this screening process were combined into four remedial alternatives. The preferred remedial alternative for Site FT001 is Alternative 3. The four remedial alternatives evaluated are described below:

Alternative 1 – No Action

<i>Capital Cost:</i>	\$0
<i>Operations and Maintenance (O&M) Cost:</i>	\$0
<i>Total Present Value:</i>	\$0

Under the Defense Environmental Restoration Program, evaluation of a no-action remedial alternative is required, pursuant to the NCP, 40 Code of Federal Regulations [CFR] 300.430[e][6], to provide a baseline for comparison with other remedial alternatives. Under Alternative 1, No Action would be taken to address the impacted media identified at the site. With the No Action alternative, no formal programs would be put into place to control or monitor potential receptor exposures to site contaminants. Over time, the organic contaminants would attenuate naturally. Alternative 1 does not meet the RAOs and does not comply with the ARARs.

Alternative 2 – Land Use Controls, Cover and Monitored Natural Attenuation

<i>Capital Cost:</i>	\$176,000
<i>O&M Cost:</i>	\$1,054,000
<i>Total Present Value:</i>	\$1,230,000

Alternative 2 consists of the following actions:

- File a Notice of Environmental Contamination with the state recorder’s office.
- Utilize administrative procedures and policies (LUCs) to prevent receptors from coming into contact with contamination at the site, until cleanup goals are achieved.

Design and install a soil cover over the contaminated surface soil and prevent ponding of surface water over the FTPA circle.

- Apply MNA to verify that COC concentrations in groundwater are stable or decreasing and that the contaminant *plume* is not expanding.
- Conduct Five-Year Reviews to evaluate the protectiveness of the remedy and modify if necessary.

Alternative 2 would require long-term maintenance of institutional controls that would be used to prevent uncontrolled exposure of potential receptors to contaminated soil and groundwater. Controls/monitoring would be required if any excavation activities are performed that are unrelated to site restoration. In addition, land use would be restricted to preclude residential development and withdrawal of groundwater for any beneficial use over the groundwater plume. Any structures built at the site would need to be designed and constructed to mitigate vapor intrusion concerns. Implementation of Alternative 2 would require documentation of the LUCs, maintenance of administrative controls through review of work clearance permits, periodic inspections of the site, periodic monitoring of contaminant concentrations and corrective action for LUC violations. A LUC implementation plan would be prepared, and LUCs would be maintained until cleanup goals are achieved. A soil cover would be added to the site to prevent exposure of receptors to surface soil and prevent ponding of surface water over the former FPTA circle. Periodic soil sampling would be conducted once every ten years to track the natural attenuation of COCs in soil. Groundwater monitoring would be conducted to ensure contaminants in groundwater are not migrating. Details of the MNA sampling would be described in a work plan. An investigation would also be completed to determine if the subsurface fuel pipeline at Site FT001 was properly abandoned in place. If fuel is found in the pipeline the fuel would be removed and the pipe would be properly abandoned.

A time period of at least 100 years is anticipated for Alternative 2. RAO 1 would be achieved after installing a soil cover and implementing LUCs. LUCs would not achieve RAOs 2 and 3; however, because Site FT001 is located within the airfield, access is already restricted, LUCs should effectively protect human receptors from exposure to COCs at concentrations that could pose a hazard. All RAOs would eventually be met through MNA, but only over a long timeframe.

Alternative 3 –Bioventing, Cover, Land Use Controls, and Monitored Natural Attenuation

<i>Capital Cost:</i>	\$779,000
<i>O&M Cost:</i>	\$1,631,000
<i>Total Present Value:</i>	\$2,410,000

Alternative 3 consists of the following actions:

- All components of Alternative 2, with the addition of bioventing.
- Install a bioventing system to treat GRO, DRO and other petroleum constituents in soil.
- In conjunction with the installation of the bioventing system, install a soil cover consisting of clean soil and plastic sheeting over the surface of the site to prevent ponding of surface water over the FTPA circle and to increase the effectiveness of bioventing in the shallow surface soil.

A bioventing system would be installed to remove GRO, DRO and other petroleum contamination from the soil. A soil and plastic sheeting cover would be constructed to promote drainage away from the FTPA circle and to enhance bioventing treatment of petroleum constituents in soil. If treatment of residual TCE contamination is required after the completion of bioventing, an SVE contingency would be implemented following the operation period of the bioventing system. If MNA is not sufficient to treat the benzene plume in groundwater, biosparging/air sparing would be implemented as a contingency remedy.

Bioventing works by injecting air into the soil to biodegrade contaminants. Bioventing supplies oxygen to the existing soil microorganisms; these microorganisms utilize the oxygen and break down the petroleum compounds to carbon dioxide and water. The bioventing system would consist of a blower that would be installed in a small shed at the site and electrical power would be provided via connection to a nearby transformer. The blower would be connected to a network of air injection wells installed in the area with petroleum hydrocarbons in the soil. Piping would be buried and several vapor monitoring points would be installed in order to measure the effectiveness of the bioventing system at various locations at the site. The bioventing system would require periodic maintenance and sampling to ensure it is operating properly.

In conjunction with the bioventing system, a soil cover would be designed with at least 2 feet of clean soil with a plastic sheeting layer, such as 20 mil polyethylene or similar. The cover would be constructed over a 29,000 square foot area with exceedances of CULs to promote drainage away from the FTPA circle and to enhance bioventing treatment of petroleum constituents in shallow soil.

As with Alternative 2, Alternative 3 would include MNA for groundwater, establishing and maintaining LUCs, and conducting CERCLA Five-Year Reviews until Cleanup Complete is attained. An investigation would also be completed to determine if the subsurface fuel pipeline at Site FT001 was properly abandoned in place. If fuel is found in the pipeline

the fuel would be removed and the pipe would be properly abandoned.

With Alternative 3, the bioventing system is assumed to be in operation for 15 years. This alternative is expected to take approximately 20 years to reach cleanup goals.

With Alternative 3, RAO 1 would be achieved as soon as LUCs are implemented. RAO 2 would be achieved once concentrations of COCs in groundwater are reduced below CULs by MNA or biosparging/air sparing if necessary. RAO 3 (prevent further degradation of groundwater) would be achieved once contaminant concentrations in soil are reduced to concentrations protective of groundwater by bioventing and if necessary, using SVE for TCE in soil.

Alternative 4 – *In Situ* Chemical Oxidation, Cover, Land Use Controls, and Monitored Natural Attenuation

<i>Capital Cost:</i>	\$10,900,000
<i>O&M Cost:</i>	\$8,700,000
<i>Total Present Value:</i>	\$19,600,000

Alternative 4 consists of the following actions:

- All components of Alternative 2.
- Collect soil samples to improve and optimize chemical oxidant placement.
- Treat COCs in soil using ISCO. The estimated treatment area is approximately 18,000 square feet.
- Conduct annual sampling of VOCs and petroleum hydrocarbons in groundwater to monitor the progress of ISCO, and MNA remedies.

Alternative 4 targets ISCO application to areas of approximately 6,000 square feet to a depth of 3 feet bgs and approximately 12,000 square feet to a depth of 8 feet bgs. Alternative 4 relies on MNA for groundwater contamination downgradient and beneath treatment area. The application of ISCO would likely be achieved through a combination of direct injection and soil mixing of ISCO into shallow soil. Multiple ISCO treatments would be implemented over a span of multiple years.

As with Alternatives 2, and 3, LUCs, MNA, and CERCLA Five-Year Reviews would be required until Cleanup Complete is achieved. Following completion of the ISCO applications, the soil would be regraded to prevent ponding of water and to promote drainage away from the FTPA circle. An investigation would also be completed to determine if the subsurface fuel pipeline at Site FT001 was properly abandoned in place. If fuel is found in the pipeline the fuel would be removed and the pipeline would be properly abandoned.

With Alternative 4, RAO 1 would be achieved by implementing LUCs. ISCO would be implemented to achieve RAOs 2 and 3 (reduce concentrations in groundwater and reduce concentrations in soil). Once CULs are achieved, all LUCs would be removed from the site. Alternative 4 is expected to reach cleanup goals in approximately 30 years.

H. EVALUATION OF ALTERNATIVES

During the detailed analysis phase, remedial alternatives were evaluated with respect to seven of the nine evaluation criteria outlined by the NCP (40 CFR 300.430) and USEPA guidance for conducting FSs under CERCLA. These evaluation criteria are divided into three categories: *threshold criteria*, *primary balancing criteria*, and *modifying criteria*. Threshold criteria are those that must be met for an alternative to be viable for selection in the Interim ROD. Primary balancing criteria form the basis for comparing alternatives for the site-specific conditions. Modifying criteria are addressed in the Interim ROD after the RI, FS, and this PP are completed, incorporating state and community feedback.

The nine evaluation criteria are categorized as follows:

Threshold Criteria

- Overall protection of human health and the environment
- Compliance with ARARs

Primary Balancing Criteria

- Long-term effectiveness and permanence
- Reduction of toxicity, mobility or volume (TMV) through treatment
- Short-term effectiveness
- Implementability
- Cost

Modifying Criteria

- State acceptance
- Community acceptance

Each remedial alternative was evaluated against the criteria. The results are summarized in **Table 3** and explained in further detail in the following sections.

H.1 Threshold Criteria

The two threshold criteria (Overall Protection of Human Health and the Environment, and Compliance with ARARs) are used as pass/fail criteria to reflect the emphasis on these criteria over other evaluation criteria.

Remedial alternatives that fail to meet the threshold criteria were removed from further evaluation and not evaluated with respect to the balancing criteria.

Table 3 summarizes the comparative analysis of the remedial alternatives for Site FT001, and includes both the threshold and balancing criteria.

H.1.1 Overall Protection of Human Health and the Environment

Overall protection of human health and the environment is measured by whether the RAOs are achieved. Achievement of RAOs could not be demonstrated by Alternative 1, and therefore this alternative fails to meet this threshold criterion. Alternative 2 (LUCs, soil cover, and MNA) would protect human health by implementing LUCs, a soil cover would reduce the risk to human receptors, and MNA would ultimately achieve the remaining RAOs through natural attenuation processes, although some recalcitrant COCs (e.g., DRO) would take many years to attenuate. Alternatives 3 and 4 would achieve all RAOs and are considered protective of human health and the environment.

H.1.2 Compliance with Applicable or Relevant and Appropriate Requirements

Except for Alternative 1, 'No Action', each alternative complies with ARARs. Detailed information on the ARARs can be found in the FS report for Site FT001.

H.2 Primary Balancing Criteria

A numerical ranking system was developed for comparison and ranking of the remedial alternatives that pass the threshold criteria. The five primary balancing criteria are weighted to provide a maximum possible 20 points each for a total possible score of 100 points. Modifying criteria (state and community acceptance) are not included in the ranking system, but will be considered in the selection of the final remedy in the Interim ROD though the comments received on the PP. Ranking assignments were simplified to provide relative indications of very low, low, moderate, or high conformance with the specified criteria. **Table 3** summarizes the comparative analysis of the remedial alternatives for Site FT001 and lists their numerical scores against the evaluation criteria.

H.2.1 Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of the remedial alternative to maintain reliable protection of human health and the environment over time. This criterion

Table 3- Comparative Analysis of Remedial Alternatives for Site FT001

CRITERIA	Alternatives			
	1 No Action	2 Cover, LUCs and MNA	3 Bioventing, Cover, LUCs and MNA	4 ISCO, Cover, LUCs and MNA
THRESHOLD CRITERIA				
Overall Protection of Human Health and the Environment	Fail	Pass	Pass	Pass
Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)	Fail	Pass	Pass	Pass
BALANCING CRITERIA ⁽¹⁾				
Long-Term Effectiveness and Permanence	N/A	6	20	20
Reduction of Toxicity, Mobility, or Volume Through Treatment	N/A	0	20	20
Short-Term Effectiveness	N/A	20	13	6
Implementability	N/A	20	13	6
Cost	N/A	20	13	6
MODIFYING CRITERIA				
State Acceptance	N/A	Neutral	Accept	Neutral
Community Acceptance	N/A	TBD	TBD	TBD
TOTAL SCORE	N/A	66	79	58

Notes: ISCO = in situ chemical oxidation, MNA = monitored natural attenuation, N/A = not applicable because the alternative failed threshold criteria, TBD = to be determined.

1. Balancing Criteria Scores based on the following: Very Low = 0, Low = 6, Moderate = 13, High = 20. Scoring for Table 3 was updated in response to input from ADEC subsequent to the finalization of the Site FT001 FS report.

includes the consideration of residual risk that would remain on-site following remediation (if any), and the adequacy and reliability of controls. Alternative 2 was scored “low” (6) because this alternative assumes the LTM of LUCs to prevent receptors from being exposed to contamination. Because both Alternatives 3 and 4 actively treat or remove contamination to ultimately achieve Cleanup Complete, both alternatives were scored “high” (20).

H.2.2 Reduction in Toxicity, Mobility, or Volume through Treatment

Reduction in TMV through treatment refers to the anticipated performance of the treatment technologies that may be included as part of the remedial alternative. Because Alternative 2 relies solely on natural processes to reduce TMV of contaminants at Site FT001 and does not utilize any treatment technologies, this alternative was scored zero points (0). Alternatives 3 and 4 use engineered treatment technologies that would be implemented to reduce site-related COC concentrations in both soil and groundwater to achieve Cleanup Complete. Because both Alternative 3 and 4 actively treat contaminants and would achieve Cleanup Complete, both were scored “high” (20).

H.2.3 Short-Term Effectiveness

Short-term effectiveness addresses protection of human health and the environment during the time needed to construct and implement the remedy; and evaluates adverse impacts to workers, the community, and the environment during construction and operation of the remedy. Alternative 2 has minimal construction activity associated with the soil cover. Due to the lack of significant construction activity and the site location within the restricted airfield, there is little risk posed to construction workers, the community, or the environment by Alternative 2, so this alternative was scored “high” (20) against this criterion. Due to the construction activity, there are risks posed to construction workers, the community, and the environment; however, these tasks are routine construction activities and are considered low-risk activities. Alternative 3 involves construction and long-term O&M of a bioventing system, while Alternative 4 uses periodic short duration injections of ISCO to treat the same contaminants. Because of the long-term (15 years) O&M associated with bioventing, Alternative 3 was scored “moderate” (13). Alternative 4, which uses ISCO, requires transportation, storage, and handling of chemical oxidants by workers and therefore was scored “low” (6) against this criterion. Alternative 4 is expected to pose a relatively greater risk to site workers due to the chemical oxidants used as compared to the long-term operation of the bioventing system in Alternative 3.

H.2.4 Implementability

Implementability addresses the technical and administrative feasibility of a remedial alternative from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered. Alternative 2 only involves monitoring groundwater, installing soil cover, maintaining LUCs, and eventually abandoning the well(s). Constructing a soil cover would use a local source of clean soil and conventional construction equipment. These activities are easily implemented and, therefore, Alternative 2 was scored “high” (20) against this criterion. Alternative 3 involves installation and O&M of a bioventing system and implementing LUCs. Equipment and materials for the bioventing system would be procured from vendors in the lower 48 states and shipped to Galena. The system would require connection to an electrical power source, likely by installing a new transmission line across the dike road from the existing power line to the northern end of the treatment area. These activities are logistically challenging within the Galena airfield, and therefore Alternative 3 was scored “moderate” (13) against this criterion. Alternative 4 involves applying ISCO through injection or soil mixing. Like Alternative 3, materials for this remedy would need to be shipped to Galena by barge. The large volume of oxidants that would be required would be challenging to ship due to limited commercial barge capacity, and to store and handle at the site due to airfield logistics; therefore, Alternative 4 was scored “low” (6) against this criterion.

H.2.5 Cost

The estimated TPV costs for the remedial alternatives that passed the threshold criteria are:

Remedial Alternative 2: \$1,230,000

Remedial Alternative 3: \$2,410,000

Remedial Alternative 4: \$19,600,000

Based on the relative costs of these alternatives, Alternative 2 was scored “high” (20), Alternative 3 was scored “moderate” (13), and Alternative 4 was scored “low” (6). The total present value cost is based on a 1.50 percent discount rate. Cost estimates were developed following USEPA guidance and are considered accurate to within -30 percent to +50 percent of actual expected costs.

I. PREFERRED ALTERNATIVE

Based on the comparative analysis of alternatives described above and the scoring results summarized in **Table 3**, Alternative 3 is selected as the preferred remedial alternative. Alternative 3 received the

highest cumulative score based on the evaluation criteria applied.

Alternative 3 uses a bioventing system would be installed to treat GRO, DRO, and other petroleum constituents in unsaturated soil at concentrations exceeding the ADEC Method Two migration to groundwater CULs. A soil and plastic sheeting cover would be constructed to promote drainage away from the FPTA circle and to enhance bioventing treatment of petroleum constituents in shallow soil. With this alternative, contaminants in groundwater would be addressed *in situ* using MNA, and LUCs would be required until Cleanup Complete is attained. As a contingency, the bioventing system could easily be converted into a SVE system if TCE concentrations still exceed CULs after the petroleum hydrocarbons have been remediated by bioventing. Biosparging/air sparging also has been retained as a contingency measure to be implemented if MNA does not effectively address the benzene plume in groundwater.

The proposed preferred alternative is based on current information and could change in response to public comments or new information.

With Alternative 3, RAO 1 would be achieved as soon as LUCs are implemented. RAO 2 would be achieved once concentrations of COCs in groundwater are reduced below CULs by MNA or biosparging/air sparing if necessary. RAO 3 would be achieved once contaminant concentrations in soil are reduced to concentrations protective of groundwater by bioventing and SVE (if required).

With Alternative 3, Site FT001 is expected to reach "remedy in place" within two years of finalizing the Interim ROD. Baseline and annual soil vapor sampling of VOCs will monitor the progress of the bioventing remedy, and soil samples will be collected to confirm that contaminant concentrations in soil have been reduced below CULs. Groundwater monitoring will be conducted in association with MNA to document achievement of groundwater CULs. The time-frame for achieving Cleanup Complete is expected to be on the order of 20 years. LUCs and Five-Year Reviews will be required until Cleanup Complete is achieved.

Remedy details will be provided in a work plan, which will detail the design of the remediation systems and the performance monitoring program. The work plan will specify performance metrics and outline a plan for system modification, optimization, and contingencies.

After completing site cleanup, the risk from hazardous substances will be evaluated to ensure it does not exceed a cumulative carcinogenic risk of 1 in 100,000 or a cumulative non-carcinogenic hazard index of 1 across all exposure pathways per 18 AAC

75.325(g). Alternative 3 is expected to take 20 years to meet CULs at an estimated total present value cost of \$2,410,000.

Based on information currently available, the Air Force believes the preferred remedial alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The Air Force expects the preferred remedial alternative to satisfy the statutory requirements of CERCLA § 121(b):

- 1) Be protective of human health and the environment;
- 2) Comply with ARARs;
- 3) Be cost-effective;
- 4) Utilize permanent solutions and alternative treatment technologies to the maximum extent practicable; and
- 5) Satisfy the preference for treatment as a principal element.

ADEC concurs that the alternative selected complies with state law and has approved the Site FT001 FS. ADEC can also provide additional comments to the Air Force during the public comment period for this PP.

J. COMMUNITY PARTICIPATION

A public meeting will be held to allow the public the opportunity to review and provide comments on this PP. Details of the meeting are provided in the "Community Involvement Opportunities" text box, together with the location of the AR for the Former Galena FOL.

Relevant documents found in the AR include:

- Supplemental Remedial Investigation Report, Fire Protection Training Area (Site FT001), Former Galena Forward Operating Location, Alaska, Final (AR #451870).
- Remedial Investigation Results Report, Fire Protection Training Area (Site FT001), Former Galena Forward Operating Location, Alaska, Final (AR #649)
- Feasibility Study Report for Fire Protection Training Area (Site FT001), Final (AR #539938).
- Human Health and Ecological Risk Assessment, Fire Protection Training Area, Final (Site FT001), Former Galena Forward Operating Location, Alaska, Final (AR #458937).

Acronyms and Abbreviations

µg/L	microgram(s) per liter	RAO	remedial action objective
AAC	Alaska Administrative Code	RI	remedial investigation
ADEC	Alaska Department of Environmental Conservation	ROD	Record of Decision
AFCEC	Air Force Civil Engineer Center	RRO	residual range organics
AR	Administrative Record	SVOC	semi-volatile organic compound
ARAR	Applicable or Relevant and Appropriate Requirement	TCE	trichloroethene
bgs	below ground surface	TMV	toxicity, mobility, or volume
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	USEPA	United States Environmental Protection Agency
CFR	Code of Federal Regulations	VOC	volatile organic compound
COC	constituent of concern		
CUL	cleanup level		
DoD	Department of Defense		
DRO	diesel range organics		
EDB	ethylene dibromide		
FOL	Forward Operating Location		
FPTA	Fire Protection Training Area		
FS	Feasibility Study		
GRO	gasoline range organics		
LUC	land use control		
mg/kg	milligram(s) per kilogram		
MNA	monitored natural attenuation		
NCP	National Contingency Plan		
O&M	operations and maintenance		
PAH	polynuclear aromatic hydrocarbon		
PCB	polychlorinated biphenyl		
PFC	perfluorinated compounds		
PFOA	perfluorooctanoic acid		
PFOS	perfluorooctane sulfonate		
PP	Proposed Plan		

Glossary

Administrative Record (AR): A record maintained by the USAF of all reports, studies, evaluations, records, or other information relating to the environmental restoration program for a specific installation.

Alaska Department of Environmental Conservation (ADEC): The state agency responsible for protecting public health and environment within the state. The Spill Prevention and Response Division is charged with protecting public health and the environment from sites contaminated by oil or other hazardous substances.

Applicable, relevant, or appropriate requirements (ARARs): State and federal laws and regulations that need to be met or considered in development and implementation of cleanup alternatives for a site. These include cleanup standards, standards of control, and other substantive environmental protection requirements, factors, or limitations under state and federal law.

Base Closure and Realignment Act: The federal law that provides the authority, process, and schedule for closing an operating DoD facility.

Bioventing: A technique to treat soil contaminated with petroleum products or other organic chemicals. Air is forced into the soil through specially designed wells. The oxygen enhances growth of naturally occurring bacteria in soil. The bacteria feed on the contaminants in the soil, chemically breaking down the contaminants into non-hazardous components. The air can be heated to enhance bacteria growth.

Carcinogenic Risk: Cancer risk is assessed by examining the likelihood of cancer resulting from exposure to contaminants at a site. Cancer risk is expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to carcinogens. For example, a 1 in 100,000 risk (usually written as "1 x 10⁻⁵") means for every 100,000 people (receptors) exposed to site contaminants, one extra case of cancer may occur than normally would be expected from all other causes in the area. ADEC has established a target cumulative cancer risk standard of 1 in 100,000 (1x10⁻⁵) per 18 Alaska Administrative Code (AAC) 75.325(g).

Cleanup: Efforts to mitigate environmental damages or threat to human health, safety, or welfare from hazardous substances or oil. It may include removal of hazardous substances from the environment, including restoration, remediation, and other measures necessary to mitigate or avoid further threat to public health, safety and welfare, or the environment. Cleanup is often used interchangeably

with terms like corrective action, remedial action, removal action, or response action. It is often used broadly to describe various actions or phases of an action, such as the RI/FS in the CERCLA process.

Cleanup Complete: A determination made by ADEC for a contaminated site when efforts to reduce hazardous substance contamination have either achieved the strictest levels established in state regulation, or the possibility of human exposure to any residual contamination is highly unlikely. When "cleanup complete" is achieved, land use and/or activity controls to protect human health and the environment from future exposure are not required.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA): Commonly known as the Superfund law, CERCLA is a federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The USEPA is responsible for implementing these laws. Under the program, USEPA can either: 1) pay for the site cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work, and/or 2) take legal action to force parties responsible for site contamination to clean up the site or pay back the federal government for the cost of the cleanup.

Current and Future Occupational Worker: This receptor is a standard industrial worker who works at the same location for multiple years and whose work involves incidental contact with soil, either indoors (as dust) or outdoors. This worker is not involved in excavation work, but work activities may include outdoor maintenance activities such as light landscaping. Current and future occupational workers may be exposed to constituents in soil to 2 feet bgs by incidental ingestion, dermal contact, and inhalation of ambient dust and vapors in ambient air; and inhalation of vapors migrating from subsurface soil and groundwater to indoor air. Potential exposure to constituents in groundwater may occur by ingestion as drinking water. Dermal contact with groundwater is not anticipated for the occupational worker. Additionally, dermal contact with, incidental ingestion of, and inhalation of ambient dust from subsurface soil (below 2 feet bgs) is not anticipated for the occupational worker.

Defense Environmental Restoration Program: A program establishing authorities and responsibilities for conducting environmental restoration activities at facilities under DoD jurisdiction. This law establishes DoD and Component Environmental Restoration Accounts (ERAs) to fund DERP activities (10 USC § 2701 et seq.). The Air Force conducts its DERP activities as the Environmental Restoration Program.

Diesel Range Organics (DRO): Consists of compounds that generally represent the diesel fuel range of petroleum hydrocarbons.

Feasibility Study (FS): A CERCLA document that analyzes potential remediation methods based on human health and ecological risk assessment results. The FS emphasizes RAOs and evaluates the relative advantages and disadvantages of selected potential remedial alternatives at contaminated sites.

Future Construction/Excavation Worker: The excavation/construction worker receptor is considered primarily to address short-term, but more intense exposure to surface and subsurface soil and potentially to groundwater. Excavation/trench work is assumed. Excavation/construction workers may be exposed to constituents in soil to 15 feet bgs and to shallow groundwater by incidental ingestion, dermal contact, and inhalation of ambient dust and vapors in outdoor air. For Site FT001, ingestion of groundwater as drinking water is not anticipated for the excavation/construction worker.

Gasoline Range Organics (GRO): Consists of compounds that generally represent the gasoline range of petroleum hydrocarbons.

General Response Action: A broadly defined group, class, or type of action that could possibly be used to achieve the RAOs.

Groundwater: Water found beneath the earth's surface that fills pores between soil/sediment particles (such as silt, sand, or gravel) creating a saturated zone. In aquifers, groundwater is present in sufficient quantities that it can be used for drinking water, irrigation, or other purposes.

Human Health Risk Assessment: An estimate of the potential harmful effects humans may experience as a result of exposure to chemicals in contaminated soil or groundwater.

Hypothetical Future Resident: The on-site resident receptor is evaluated to address unrestricted land use, even where future residential land use is unlikely. This receptor is a standard child/adult resident who lives at the same location for multiple years and whose activities involve contact with soil and groundwater. Hypothetical long-term future residents may be exposed to constituents in soil to 15 feet bgs by incidental ingestion, dermal contact, and inhalation of ambient dust and vapors in ambient air; and inhalation of vapors migrating from subsurface soil and groundwater to indoor air. Hypothetical near-term future residents may be exposed to constituents in soil to 2 feet bgs by incidental ingestion, dermal contact, and inhalation of ambient dust and vapors in ambient air; and inhalation of vapors migrating from subsurface soil

and groundwater to indoor air. Potential exposure to groundwater may occur by ingestion as drinking water and dermal contact. The long-term future resident scenario addresses residential development following deep excavation and redistribution of soil. The near-term future resident scenario addresses residential development without deep excavation; therefore, dermal contact with, incidental ingestion of, and inhalation of ambient dust from subsurface soil is not anticipated for near-term residents.

Modifying Criteria: Modifying criteria for remedial alternatives, which include state and community acceptance, may be considered to the extent that information is available during the FS, but can be fully considered only after public comment on the PP is received. In the final balancing of trade-offs between alternatives upon which the final remedy selection is based, modifying criteria are of equal importance to the balancing criteria.

Monitored Natural Attenuation (MNA): The remedial approach that allows natural processes to reduce concentrations of contaminants to acceptable levels. MNA involves periodic monitoring of the impacts of physical, chemical, and biological processes that act to reduce the mass, toxicity, and mobility of subsurface contamination. Physical, chemical, and biological processes involved in MNA include biodegradation, chemical stabilization, dispersion, sorption, and volatilization.

National Contingency Plan (NCP): The National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300), more commonly called the NCP, is the federal government's plan for responding to both oil spills and releases of hazardous substances (actual and potential). The NCP is at the heart of the National Response System, under which federal departments and agencies help state and local officials protect public health and the environment during hazardous materials emergencies, including emergency removal actions at hazardous waste sites.

Non-Carcinogenic Hazard Index: The measure used to describe the potential for non-cancer health effects to occur in an individual is expressed as a "hazard index". The hazard index is a comparison of the estimated exposure level (considering all contaminants present at the site and all potential pathways of exposure) to an exposure level that is considered to be without an appreciable risk of adverse effects (a "safe" level). If the hazard index (the ratio of the estimated exposure level to the "safe" exposure level) is less than 1, there is low potential for adverse human health effects resulting from exposure to contaminants at the site.

Plume: The volume of water, soil, or air impacted by the migration of contamination away from a given point of origin. The plume of a contaminant in groundwater is the volume of water which, as it moves underground, carries the contaminant with it. Portions of the plume close to the source will typically have higher concentrations than portions farther away from the source. Natural physical, chemical, and biological processes diminish the concentration levels as the water carries the contaminant away from the source.

Primary Balancing Criteria: Criteria used to weigh major trade-offs among remedial alternatives. The five criteria are long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost.

Principal Threat Waste: Principal threat wastes are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur.

Proposed Plan (PP): This document summarizes for the public the preferred cleanup strategy, rationale for the preference, and alternatives presented in the detailed analysis of the RI/FS. It must actively solicit public review and comment on all the alternatives under consideration.

Public Comment Period: The time period for the public to review and submit comment on various documents and actions. A comment period cannot be less than 30 days and upon timely request to the lead agency, the comment period will be extended by a minimum of 30 additional days.

Receptors: The organism(s) or ecological resource(s) of interest that might be adversely affected by contact or exposure to a stressor. "Stressor" means any physical, chemical or biological entity that can induce an adverse effect.

Record of Decision (ROD): A document that explains which cleanup alternative(s) will be used at a site or that justifies no further action. The ROD is based on information and technical analysis generated during the RI/FS and consideration of public comments and community concerns.

Remedial Action: The actual construction or implementation of the selected cleanup plan.

Remedial Action Objectives (RAOs): The specific goals for protecting human health and the environment. RAOs are developed by evaluating the ARARs that are protective of human health and the environment and results of the RIs, including the human and ecological risk assessments. RAOs

provide a general description of what the cleanup will accomplish.

Remedial Alternatives: General response actions that have the potential to meet the RAOs for a specific site.

Remedial Design: The phase of the project where engineering plans, technical drawings, and specifications are developed for the selected cleanup plan.

Remedial Investigation (RI): A CERCLA process to determine the nature and extent of the contamination resulting from the release of a hazardous substance. The RI emphasizes characterization and associated data collection at hazardous waste sites.

Residual Range Organics (RRO): Consists of compounds that contain heavy fuel products such as Bunker C fuel or asphalt.

Soil Vapor Extraction (SVE): A treatment technique that removes volatile contaminants from subsurface soil by removing air from the soil through vacuum extraction wells.

Threshold Criteria: Requirements that each remedial alternative must meet in order to be eligible for selection. They include overall protection of human health and the environment and compliance with ARARs.

Vapor Intrusion: The migration of released volatile chemicals from the subsurface into overlying buildings.



Proposed Plan
Air Force Proposes Environmental Restoration Alternatives for
Fire Protection Training Area (Site FT001) with Soil and Groundwater
Impacts – Public Comments Invited

The Air Force encourages the public to comment on the remedial alternatives described in this Proposed Plan. Comments may be provided in writing or verbally at the community meeting to be held on October 26, 2016, at 7:00 p.m. at the Larsen Charlie Community Hall, Galena, Alaska. Written comments may be submitted using the comment form below. If additional space is needed, comments may be written neatly on plain white paper.

In addition, the Air Force welcomes written comments submitted directly to our office. Comments may be submitted to:

Mr. AL Weilbacher
2261 Hughes Ave. Ste 155
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General Questions/Comments may also be referred to the Air Force Public Affairs team at (866) 725-7617 or afcec.pa@us.af.mil.

After the comment period closes on November 28, 2016, the Air Force will respond to all comments, which will be included in the responsiveness summary of the Interim ROD.

Please complete the following information and mail to the address above or copy into an email to Mr. Weilbacher.

Name: _____
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- I support the Air Force's preferred alternative
 I do not support the Air Force's preferred alternative

Additional Comments:

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