

Proposed Plan for Remedial Action

Nike Site Summit (SSO47) Joint Base Elmendorf-Richardson (JBER), Alaska



October 2016

Nike Site Summit

PUBLIC COMMENT PERIOD

October 3, 2016 through November 3, 2016

OPEN HOUSE AND PUBLIC MEETING

7:00 pm Wednesday, October 19, 2016 Fairview Community Recreation Center 1121 East 10th Avenue Anchorage, Alaska 99501

INTRODUCTION

The U.S. Air Force (USAF) requests public comment on this **Proposed Plan** for cleanup of contaminated soil at Nike Site Summit (SS047), located on Joint Base Elmendorf-Richardson (JBER), Alaska.

This public comment period begins on October 3, 2016 and ends on November 3, 2016. A public meeting will be held October 19, 2016, at the Fairview Community Recreation Center in Anchorage, Alaska, to discuss clean-up alternatives, answer questions, and receive public comment.

The purpose of this proposed plan is to:

- Explain changes resulting from an informal dispute;
- Provide site history and background information;
- Describe the remedial options that were evaluated in a supplemental feasibility study;
- Identify and explain the preferred alternatives for remedial action;
- Solicit public input on all of the remedial alternatives described; and
- Provide information on how the public can get involved in the remedy selection process.

Environmental terms in **bold and italics** are defined in the glossary on the final page of this Proposed Plan.



This Proposed Plan highlights key information from the Nike Site Summit Remedial Investigation Report, May 2012 and Nike Site Summit Feasibility Study (FS) Report, February 2013 and is based on the recently released SS047 Supplemental Feasibility Study (SFS), May 2015. The SFS was prepared to document changes to contaminated media, **chemicals of concern (COCs)**, and remedial alternatives evaluated for SS047 based on the results of the informal dispute resolution between USAF, U.S. Environmental Protection Agency (EPA), and Alaska Department of Environmental Conservation (ADEC), as documented in the SS047 Informal Dispute Resolution Memorandum, July 2014.

Summary of Preferred Remedial Alternatives

The preferred remedial alternatives for the sites discussed in this proposed plan are Excavation and Off site Disposal of surface soil at Upper Site Summit, and Excavation and Off-site Disposal of surface and subsurface soil at Lower Site Summit. These preferred alternatives, and the methods in which they were chosen, are explained in depth on pages 15-18.

Public Participation

This Proposed Plan presents different preferred alternatives for areas of SS047 based on the results of SFS. The SFS and the Informal Dispute Memorandum for Nike Site Summit (SS047), as well as other reports and information, are contained in the Administrative Record file. A copy of the Administrative Record file is available for public review at the location listed under the "Where Do I Get More Information" section on the final page of this proposed plan.

Public input on all alternatives and the rationale for the **Preferred Alternative** is very important to the remedy selection. New information the USAF learns during the public comment period could result in the selection of a final remedial action that differs from the Preferred Alternative. Therefore, the public is encouraged to review and comment on all alternatives in this Proposed Plan. Following public comment, a Record of Decision (ROD) will be issued that selects the final cleanup remedy. Public comments on the Proposed Plan and responses to those comments will be included in the ROD.

This Proposed Plan has been prepared by the USAF and fulfills public participation requirements under Section 117(a) of the Comprehensive Environmental Response, Compensation, & Liability Act of 1980 (CERCLA) and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan, often called the National Contingency Plan (NCP).

SITE BACKGROUND

SS047 is located approximately 12.5 miles east of Anchorage near the eastern boundary of JBER with Chugach State Park (Figure 1). This site is on a ridgeline in the Chugach Mountains at the 2,500- to 3,900-foot elevation and covers approximately 244 acres. Nike Site Summit was used as a Nike Hercules missile site and was in operation from 1959 to 1979. This ground-based defensive system provided protection to Fort Richardson, Elmendorf Air Force Base (AFB), and the City of Anchorage against aerial attack during the Cold War. In the event of an aerial attack, guided missiles would be fired to destroy incoming aircraft. "Live" missiles were fired at Nike Site Summit between 1960 and 1964, when it was determined to no longer be safe due to growth of the population in the surrounding area. In 1979, the U.S. Army deactivated this site and removed all sensitive equipment.



Missile Launch (circa 1960's)

In 1994, the Alaska State Historic Preservation Office (SHPO) nominated Site Summit, for listing on the National Register of Historic Places (NRHP) and Site Summit was placed on the NRHP in 1996 (NRHP 1996).

The U.S. Army, EPA Region 10, and ADEC signed a Federal Facility Agreement (FFA) for Fort Richardson in December 1994. The FFA ensures that environmental impacts associated with past practices at an installation are investigated and appropriate actions are completed to protect human health and the environment. This agreement sets deadlines, objectives, responsibilities, and a procedural framework for cleanup at SS047 was added to the FFA in 2011.

A proposed plan was prepared and sent out for public comment in July 2013 and a public meeting was held on August 1, 2013 to present and receive public comments on the preferred alternatives for remedial action at SS047.

In April 2014, the EPA invoked an informal dispute in accordance with the procedures outlined in the Fort Richardson FFA, section 20.21, to delay finalization of the SS047 ROD until consensus was reached on comments that were provided on the draft ROD. In July 2014, an agreement was made between the USAF, EPA, and ADEC that the EPA's concerns would be addressed and that response actions would be re-evaluated based on the informal dispute resolution and documented in the SFS.

There are six areas at SS047 addressed within this Proposed Plan (Figure 2):

- Upper Site Summit (USS) Former Battery Control Area, located at an elevation of 3,900 feet above mean sea level, currently housing several commercial antenna installations.
- Lower Site Summit (LSS) Former Missile Launch Area, located at an elevation of about 3,100 feet above mean sea level.
- Area A Former Opportunity Strikes Radio Relay Station (RRS), a Former Borrow Area, and a Suspected Disposal Area are located at a slightly lower elevation (2,950 feet above mean sea level) than LSS.
- Area B High Explosive and Guided Missile Magazines, located about midway between LSS and USS, along the east side of the gravel road, at an elevation of 3,200 feet above mean sea level.
- Area C Pump House, is the lowest elevation area of SS047 located at 2,500 feet above mean sea level, off of Arctic Valley Road.
- Area D Former Borrow Area, located at 3,200 feet above mean sea level, adjacent to LSS.



SITE CHARACTERISTICS

SS047 lies atop the western edge of the Front Range of the Chugach Mountains. Surface materials are dense, with outcroppings of bedrock, hornfels, talus, and rocky gravelly soil. Many areas at SS047 contain gravel building pads that were constructed by leveling and spreading local terrain, as well as using local materials obtained from borrow sources.

Site Investigations

A limited preliminary assessment and site inspection (PA/SI) was conducted at SS047 in 1995 and 1996. The results from the PA/SI were used as a preliminary framework for the Remedial Investigation (RI) conducted in 2010 and 2011 and the Feasibility Study (FS) completed in 2013.

As detailed below, investigations have identified the medium of concern at USS as surface soil and the media of concern at LSS as surface and subsurface soils. Contamination at Area A and Area C is limited to non-CERLCA contaminants only, and no contaminant sources were identified at Area B or Area D.

Assessment of Sources of Contamination at USS

Due to past military activities and disposal practices at USS, contaminants are present in this area. The site was investigated as part of the PA/SI (Dowl/Ogden, 1996a, b) and RI (USAF, 2012). The RI updated previous site investigation data and provided information about the current nature and extent of contamination at USS.

Figure 3 shows the main structures at USS and contaminant concentrations above proposed cleanup levels (PCLs) detected during the RI which are identified as Action Areas. Below is a brief description of sources from each building or structure.

Battery Control and Barracks Building - Leaks or overfilling of the former diesel and gasoline underground storage tanks (USTs). Additionally, the pipeline that supplied diesel fuel from the UST to the building appears to be partially intact and some leakage is anticipated to have occurred. Both USTs were removed prior to the 1996 PA/SI.

HIPAR Foundation - No source of contamination was identified.

Electrical Substation C - Dry-type transformers (rather than oil-filled transformers) were used at the substation, and no polychlorinated biphenyl (PCB) discharge was detected.

Former Motor Pool Maintenance Building and Foundation (Action Area USS-F) - This building included a floor drain and lube-pit that likely received wastes from vehicle maintenance operations. The floor drain and lube-pit have been backfilled with soil; therefore, mobilization of any potential contamination from either within the lines or the lube pit has been minimized.

Radar Domes - The source of contamination is likely the lubricants used to operate the clam-shell enclosures of



the three radar antennas. Septic System and Outfall (Action Area USS-K) - Sanitary wastes and possibly

other wastes (oil, paints, and sediment) were collected and piped to a small concrete septic tank. Effluent from this system discharged directly onto the alpine tundra north of the facility, where surface soil contamination was documented during the RI. The septic system tank has been backfilled with soil; therefore, further mobilization of potential contamination from either within the lines or tank to the outfall has been minimized.

View toward Arctic Valley Ski Area





S Nike Site Summit Proposed Plan - October 2016

Assessment of Sources of Contamination at LSS

Figure 4 shows the main structures at LSS and contaminant concentrations above PCLs detected during the RI which are identified as Action Areas. Below is a brief description of sources from each building or structure.

Launch Control Building (Action Area LSS-Q) - A source of contamination located near the Launch Control Building was a former aboveground storage tank (AST) on the south side of the building. The RI analytical results indicate that surface and/or subsurface fuel releases occurred from this tank. The presence of petroleum hydrocarbons (PHCs), volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs) suggests that surface spills of petroleum (possibly mixed with solvents) occurred in this area.

Missile Launch Pad and Control Buildings 1 and 2 (Action Area LSS-B) - Surface soil analytical results indicate several possible release mechanisms near these features: surface spills of fuel, spills of lubricants used for the cable or guide rails, and combustion byproducts from missile launches.

Vehicle Maintenance Shop (Action Area LSS-H) - Disposal of waste oils and cleaning fluids from the Vehicle Maintenance Shop through the floor drains and lube pit presumably caused soil contamination at the terminus of the drain line from the shop.

Electrical Substation B - Small areas of surface soil are impacted with PHCs, possibly due to spills of dielectric fluids from transformers. No PCBs were detected above their PCLs in samples taken near this feature. Trichloroethylene (TCE) was detected in surface soil and was presumably used as a cleaning solvent for electrical equipment.

Electrical Substations D and D2 - Analysis of soil detected TCE, which was presumably used as a solvent for cleaning electrical equipment. The dry-type transformers (rather than oil-filled transformers) meant no PCBs were found.

Guided Missile Maintenance Facility - Samples located down-gradient from the Guided Missile Maintenance Facility, just off the LSS pad, indicate some run off from the pad to surface soil.

Missile Warhead Magazine - No source of contamination was identified at this location.

Septic Tank and Septic System Outfall (Action Area LSS-U) - Waste oil, diesel fuel, and cleaning fluids in the septic tank discharge were released to the surface soil near the Septic Tank Pump House.

Assessment of Sources of Contamination at Remaining Areas

Area A - Former Opportunity Strikes RRS, Former Borrow Area, Suspected Disposal Area – Little is known about historical operations at Area A, but anecdotal evidence and field observations indicate the likely waste sources and release mechanisms. Wastes were potentially generated and released during operation of the Former RRS, vehicle maintenance facility, barracks, dining facility, and radio equipment buildings. A likely source of subsurface soil PHC contamination at Area A is leaks from the joints of a buried 2-inch pipeline and the pipeline delivery point. The pipeline is still present and buried at the site. Based on observations of surficial staining, TCE likely was used as a cleaning agent and released to the surface at certain locations within Area A. TCE was not identified as a chemical of concern for further action under CERCLA at Area A. The detections of TCE during the remedial investigation did not exceed the outdoor inhalation cleanup level listed in 18 AAC 75.341, Table B1 Method Two: - 0.57 mg/kg. Subsurface water is not present at Area A therefore the pathway is incomplete. The remedy for Area A will be determined under state law in a separate decision document.

Area B - The High Explosive Magazine and Guided Missile Magazine – No potential sources of contamination were identified at Area B during the SI or RI.

Area C - Former Pump House – This contained a day tank to operate the pump and may have been a source of fuel releases to the surrounding area. However, accurate drawings are not available, the Pump House has been removed, and the area has been graded. The remedy for Area C will be determined under state law in a separate decision document.

Area D - Former Borrow Area – No potential sources of contamination were identified at Area D during the SI or RI.

Subsurface Water Assessment

USS

During the RI, it was determined that minimal amounts of water were present at USS. Water was found only in areas of depressed bedrock where former USTs had previously been located and had accumulated in these depressions after rainfall events or during a snowmelt period. The informal dispute resolution determined that this water would be considered "pit" water, which is not considered a drinking water source. Surface and subsurface soil consist primarily of angular and rounded gravel fill material atop of bedrock.

LSS

During the RI, low quantities of subsurface water, when present, appeared to follow the contours of the bedrock and was most plentiful in the area where a former UST was located. Subsurface water at LSS has been determined to meet EPA's definition for Class IIIA, Insufficient Yield. This classification was based on flow rates established during summertime groundwater monitoring events and the incapability of wells to produce the required average of 150 gallons per day for a family of four during the wintertime to be considered a drinking water source.

Current and Future Land Use

There are currently no manned operations at Nike Site Summit facilities; however, the general area is used by military personnel for various aspects of military training. There is recreational use near the site, with Nike Site Summit adjacent to Chugach State Park. Arctic Valley Ski Area is located in Area C and access is not restricted to the public. The ski area is utilized by non-military personnel visiting the area recreationally. The Friends of Nike Site Summit maintain structures at both USS and LSS and organize guided tours to the facilities.

SCOPE AND ROLE OF THE RESPONSE ACTION

The remedial action, or method, used to clean up the contamination at SS047 is part of a basewide effort to clean up contaminated areas. This Proposed Plan addresses all six areas at SS047. The RI, FS, and SFS for SS047 identified lead, VOC, and SVOC contamination in soil at locations within SS047. The remedial action strategy places a priority on protecting human health and the environment. To date only UST and AST removals have been carried out at SS047 and some of the buildings deemed unsafe have been demolished.

CERCLA Petroleum Exclusion

CERCLA Section 101(14) excludes certain substances from the definition of hazardous substance, thus exempting them from CERCLA. These substances include petroleum, meaning "crude oil or any fraction thereof." The EPA interprets this to include hazardous substances that are normally mixed with or added to crude oil or crude oil fractions during the refining process. Contamination resulting from spills of heating oil, diesel fuel, jet fuel, and gasoline are exempt from CERCLA. However, contamination caused by petroleum spills are regulated under Alaska Administrative Code, Title 18, Chapter 75 (18 AAC 75), Oil and Other Hazardous Substances Pollution Control.

Contamination at Area A and Area C is entirely from spills of petroleum products, and the investigations and cleanup fall under State of Alaska regulations and not CERCLA, as do some of the Action Areas in USS and LSS. Cleanup of the areas where no CERCLA hazardous substances have been detected will be managed under 18 AAC 75.

NO CERCLA RESPONSE ACTION AREAS

Area A

The CERCLA petroleum exclusion rule applies to this site. No Further Action under CERCLA is recommended for Area A. Petroleum contaminated areas will be handled under ADEC cleanup regulations. The remedy for Area A will be determined under state law in a separate decision document.

Area C

The CERCLA petroleum exclusion rule applies to this site. No Further Action under CERCLA is recommended for Area C. Petroleum contaminated areas will be handled under ADEC cleanup regulations. The remedy for Area C will be determined under state law in a separate decision document.

CERCLA RESPONSE ACTION AREAS

USS

USS was investigated and CERCLA metals and SVOCs were identified in surface soil. Therefore, a response action is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

<u>LSS</u>

LSS was investigated and CERCLA SVOCs were identified in surface soil and VOCs and SVOCs were identified in subsurface soil. Therefore, a response action is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

NO ACTION AREAS

Area B

Area B was investigated during the 1996 SI due to indications of past waste disposal. A visual site inspection was also conducted during the 2010 RI. Based on the results of these investigations, no site-related contaminants are present and no further investigation is warranted. Metals that were detected during the SI are consistent with background levels. There are no COCs at Area B. Based on these findings, No Action is recommended for Area B.

Area D

Area D was investigated during the 1996 SI because old borrow pits at other military installations were sometimes used as disposal sites. A visual site inspection was also conducted during the 2010 RI. Analytical results and observations indicate that there is no evidence of site-related contamination. Based on these findings, No Action is recommended for Area D.

SUMMARY OF SITE RISKS FOR USS AND LSS

As part of the RI, the USAF conducted a baseline risk assessment for USS and LSS to determine the current and future effects of contamination on human health and the environment. A baseline risk assessment estimates the risk the site poses if no action is taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by a remedial action. Contaminants identified by the risk assessment are included on the list of COCs.

Table 1 presents a summary of human health and ecological risks at USS and LSS. The current land use is not anticipated to change; however, future resident was included as a potential receptor to provide a conservative estimate of potential risks.

| Table 1 | Summary of Site Risks for USS and LSS | | | | | | |
|--|---------------------------------------|----|-----------------------------|----|----------------------|----|------------------------------|
| | Estimated Human Health Risks | | | | | | Estimated Ecological Risk |
| Area | Site Workers | | Site Visitors | | Residental | | Hazard Quotient ^a |
| | ILCR | HI | ILCR | HI | ILCR | н | HQ |
| Upper Site Summit | | | | | | | |
| Surface Soil | 7 x 10 ⁻⁶ | <1 | 6 x 10 ⁻⁷ | <1 | 3 x 10⁵ | <1 | >1 |
| Lower Site Summit | | | | | | | |
| Surface Soil | 3 x 10⁻⁵ | <1 | 3 x 10 ⁻⁶ | <1 | 6 x 10 ⁻⁵ | <1 | >1 |
| Subsurface Soil | 2 x 10 ⁻⁴ | <1 | 2 x 10 ⁻⁵ | <1 | 4 x 10 ⁻⁴ | >1 | <1 |
| Key: Values in BOLD/RED are above project acceptable risk criterion. < - less than > - greater than a - An ecological risk assessment was only conducted for surface soil. HI - Hazard index HQ - Hazard quotient ILCR - Incremental lifetime cancer risk | | | | | | | |

Human Health Risks

A human health risk assessment (HHRA) estimates the nature and probability of adverse health effects in humans who may be exposed to chemicals in contaminated environmental media, now or in the future. Two measurable outcomes of a HHRA are the *incremental lifetime cancer risk (ILCR)* and non-cancer *hazard index (HI)* that may result from human exposures to contaminants at a site. The ILCR is the likelihood of one additional person, over the national average, developing cancer from exposure to contamination. An ILCR criterion up to 1×10^{-5} (one person in 100,000) is proposed at SS047. The national average risk of developing cancer is about 1 in 3. The HI expresses the likelihood that exposure to a contaminant will cause a negative health effect other than cancer. An HI greater than 1 indicates a potential for a non-cancerous health effect to result from exposure to a contaminant. Where the cumulative effect of more than one contaminant resulted in the project risk criterion being exceeded, a risk-based concentration level (RBCL) for this chemical was calculated to achieve unrestricted use.

Although the estimated human health risk for USS exceed the ILCR criteria, this is due to naturally occurring Arsenic. There is no proposed cleanup level for Arsenic.

The risk at LSS is from site worker, site visitor, or future resident contact with the following contaminants in subsurface soils.

- 1,2-Dibromo-3-chloropropane A RBCL for this chemical was calculated at 0.104 milligrams per kilogram (mg/kg).
- 1,2,3-Trichloropropane A RBCL for this chemical was calculated at 0.097 mg/kg.
- 1,1,2-Trichloroethane A RBCL for this chemical was calculated at 0.831mg/kg.

Although the estimated human health risk for LSS exceed the ILCR criteria, this is due to naturally occurring Arsenic. There is no proposed cleanup level for Arsenic.

The risk at LSS is from site worker, site visitor, or future resident contact with the following contaminants in surface soils.

 Pentachlorophenol – A RBCL for this chemical was calculated at 7.67 mg/kg. Note: The pentachlorophenol valve is a ERBCL as it is lower than the calculated RBCL of 10.7 mg/kg.

Ecological Risks

An ecological risk assessment is the process for evaluating how likely it is that the environment may be impacted as a result of exposure to one or more environmental stressor such as chemicals, land change, disease, invasive species and climate change. An ecological risk assessment was conducted to determine if plants or animals might be exposed to contaminants and if the exposure could have adverse effects. Not all exposure pathways existed at SS047 but the analysis investigated if plants could be exposed to contaminants in air, soil, water, or sediment. Animals can be exposed to contaminants in air, soil, water, sediment, and (if they burrow) vapors from soil or groundwater. Animals may also be exposed to contaminants by eating contaminated plants or other animals. A contaminant is considered to be potentially harmful to the environment if it has a hazard quotient (HQ) greater than 1. Where the cumulative effect of more than one contaminant resulted in the project risk criterion being exceeded, an ecological risk-based concentration level (ERBCL) was calculated to achieve unrestricted use.

The estimated ecological risk at USS, was calculated based on the Masked Shrew, which exceeded the HQ criterion of 1, driven by the following contaminant in surface soil:

- Lead An ERBCL for this chemical was calculated at 204 mg/kg.
- Cadmium An ERBCL for this chemical was calculated at 1.49 mg/kg.

The estimated ecological risk at LSS was calculated based on the Masked Shrew, driven by the concentrations of the following contaminants in surface soil:

- Bis(2-ethylhexyl)phthalate An ERBCL for this chemical was calculated at 0.549 mg/kg; and
- Pentachlorophenol An ERBCL for this chemical was calculated at 7.67mg/kg.



West/Northwest View of Lower Site Summit

Risk Summary

The Preferred Alternatives identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, are necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are specific goals for protecting human health and the environment. RAOs are developed by evaluating the results of the RI, including the human health and ecological risk assessments, and establishing goals that will be achieved by implementation and/or completion of remedial actions. RAOs are media-specific and are presented below by area. The RAOs are designed to address the COCs identified by the risk assessment and contaminants at concentrations exceeding the ADEC Method 2 soil cleanup levels for the under 40-inch zone, which were developed using risk-based criteria.

USS RAOs:

Prevent direct contact (ingestion or dermal absorption) with surface soil which has contaminant concentrations
that exceed cleanup levels as stated in Table 2. The contaminants that exceed these levels and contribute to
USS human health risks are:

- Surface soil: benzo(a)pyrene, benzo(b)fluoranthene and lead.

- Prevent exposure of ecological receptors (Masked Shrew and American Robin) to surface soil with contaminant concentrations that exceed cleanup levels as stated in Table 2. The contaminants that exceed these levels and contribute to USS ecological receptor health risks are:
 - -Surface soil: cadmium and lead

LSS RAOs:

- Prevent direct contact with surface and subsurface soil which has contaminant concentrations that exceed cleanup levels as stated in Table 3. The contaminants that exceed these levels and contribute to LSS human health risks are:
 - -Surface soil: benzo(a)pyrene, benzo(b)fluoranthene, and pentachlorofhenol.
 - Subsurface soil: 1,1,2-Trichloroethane, 1,2,3-Trichloropropane, 1,2-Dibromo-3-chloropropane, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene.
- Prevent exposure of ecological receptors (Masked Shrew and American Robin) to surface soil with contaminant concentrations that exceed cleanup levels as stated in Table 3. The contaminants that exceed these levels and contribute to LSS ecological receptor health risks are:



- Surface soil: bis(2-ethylhexyl)phthalate, pentachlorophenol, and cadmium.

USS Battery Control and Barracks Building (Demolished in 2012) - Looking Eastward

LSS - Missile Launch and Control Pad 1 (2010)

Table 2 USS - Chemicals of Concern by Media and Proposed Cleanup Levels

| Chemicals of Concern by Media | Maximum Detection | Detection Frequency | PCL | PCL Basis | |
|--|----------------------|------------------------|------|-----------|--|
| Surface Soil (0 to 2 feet bgs) (mg/Kg) | | | | | |
| Metals | | | | | |
| Cadmium | 23.9 | 15 of 15 | 1.49 | ERBCL | |
| Lead | 950 | 15 of 15 | 204 | ERBCL | |
| Semi-Volatile Organic Compounds | | | | | |
| Benzo(a)pyrene | 5.75 | 8 of 23 | 0.49 | ADEC dc | |
| Benzo(b)fluoranthene | 10.6 | 8 of 23 | 4.9 | ADEC dc | |
| Kov | | | | | |

ADEC – Alaska Department of Environmental Conservation

ADEC – Ataska Department of Environmental Conservation bgs – below ground surface dc – 18 AAC 75.341, method 2, Table B1, direct contact, under 40 inch zone HHERA – human heal and ecological risk assessment ERBCL – Ecological risk-based concentration level (calculated in the HHERA)

mg/kg – milligrams per kilogram PCL – proposed cleanup level USS – Upper Site Summit

Table 3 LSS Chemicals of Concern by Media and Proposed Cleanup Levels

| Chemicals of Concern by Media | Maximum Detection | Detection Frequency | PCL | PCL Basis | | |
|---|----------------------|------------------------|-------|-----------|--|--|
| Surface Soil (0 to 2 feet bgs) (mg/Kg) | | | | | | |
| Metals | | | | | | |
| Cadmium | 15.6 | 34 of 34 | 1.49 | ERBCL | | |
| Semi-Volatile Organic Compounds | | | | | | |
| Benzo(a)pyrene | 2.83 | 12 of 37 | 0.49 | ADEC dc | | |
| Benzo(b)fluoranthene | 6.15 | 11 of 37 | 4.9 | ADEC dc | | |
| Bis(2-ethylhexyl)phthalate | 5.44 | 3 of 37 | 0.549 | ERBCL | | |
| Pentachlorophenol | 46.5 | 1 of 37 | 7.67 | ERBCL | | |
| Subsurface Soil (greater than 2 feet bgs) (mg/Kg) | | | | | | |
| Volatile Organic Compounds | | | | | | |
| 1,1,2-Trichloroethane | 1.65 | 1 of 36 | 0.831 | RBCL | | |
| 1,2,3-Trichloropropane | 0.491 | 1 of 36 | 0.097 | RBCL | | |
| 1,2-Dibromo-3-chloropropane | 3.040 | 1 of 36 | 0.104 | RBCL | | |
| Semi-Volatile Organic Compounds | | | | | | |
| Benzo(a)anthracene | 37 | 2 of 36 | 4.9 | ADEC dc | | |
| Benzo(a)pyrene | 35.7 | 2 of 36 | 0.49 | ADEC dc | | |
| Benzo(b)fluoranthene | 40.1 | 2 of 36 | 4.9 | ADEC dc | | |
| Dibenzo(a,h)anthracene | 6.12 | 2 of 36 | 0.49 | ADEC dc | | |
| Indeno(1,2,3-c,d)pyrene | 16.1 | 2 of 36 | 4.9 | ADEC dc | | |

Key: ADEC – Alaska Department of Environmental Conservation bgs – below ground surface dc – 18AAC 75.341, method 2, Table B1, direct contact, under 40 inch zone ERBCL – Ecological risk-based concentration level (calculated in the HHERA) HHERA – Human Health and Ecological Risk Assessment

LSS - Lower Site Summit

mg/kg – milligrams per kilogram PCL – proposed cleanup level RBCL – Risk-based cleanup level calculated in the HHERA)

USS Proposed Cleanup Levels

Contaminated surface soil remains above an acceptable risk level. COCs and RAOs have been identified, as well as a preferred alternative for these surface soil contaminants. Table 2 presents the COCs at USS by media and the PCLs. The CERCLA Action Area for USS (Action Areas USS-F and USS-K) are shown on Figure 3 in green.

LSS Proposed Cleanup Levels

Contaminated surface and subsurface soil remain above an acceptable risk level. COCs and RAOs have been identified, as well as a preferred alternative for these surface and subsurface soil contaminants. Table 3 presents the COCs at LSS by media and the PCLs. The CERCLA Action Area for LSS (Action Areas LSS-B, LSS-H, LSS-Q and LSS-U) are shown on Figure 4 in green.

It is the USAF's current judgment that the Preferred Alternatives identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, are necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

SUMMARY OF REMEDIAL ALTERNATIVES

The response actions considered for SS047 were originally evaluated during the FS and reevaluated during the SFS. This Proposed Plan presents the results of remedial alternatives evaluated for USS and LSS only and eliminates the migration-to-groundwater pathway as a potential exposure route, as a result of the informal dispute. The evaluation of these remedial alternatives is presented in the *SS047 Supplemental Feasibility Study*, May 2015 and is discussed below.

Following screening of the technologies and process options, the following response actions were retained for evaluation as part of the remedial alternatives:

No Action. This response action consists of leaving the impacted soil in its current condition, with no further investigation or remedial action. Evaluation of this response action is required by the NCP.

Land Use Controls (LUCs). A LUC is any type of physical, legal, proprietary or administrative mechanism that restricts the use of, or limits access to, real property to prevent or reduce risks to human health and the environment. Physical mechanisms (i.e., engineering controls) encompass a variety of engineered remedies to contain or reduce contamination and physical barriers to limit access to property, such as landfill caps, fences, or signs. The legal, proprietary, or administrative mechanisms used for LUCs are generally the same as those used for institutional controls (ICs), as discussed in the NCP. Examples of ICs include deed notices; IC registries, property easements and covenants; installation administrative controls, such as construction and work request review and approval processes; and administrative orders and cleanup agreements.

Excavation and Off-Site Disposal. For soil, excavation refers to removing contaminated soil, backfilling with clean material, and disposal of the excavated soil at a permitted treatment/ disposal facility. All CERCLA excavated waste will be required to be transported to an EPA-approved disposal facility in the Lower 48, as there are none in the State of Alaska. Excavation and disposal will be achieved in a single construction season.

The Following Remedial Alternatives Were Evaluated at Each Site

Alternative USS-1 – No Action

Under this alternative, no remedial actions would be taken, monitoring would not be conducted, and LUCs would not be implemented to prevent exposures. Although natural attenuation may occur, contaminant reductions would not be verified with monitoring. No cost is associated with this alternative. Abandonment of existing USS groundwater monitoring wells would need to be considered if no remedial actions are taken, although this is not assumed in the Alternative USS-1 cost estimate.

Alternative USS-2 – Surface Soil Excavation with Off-site Disposal

Alternative USS-2 includes excavation of impacted surface soil from locations exceeding PCLs in surface soil samples. There is no subsurface contamination at USS. This alternative would directly address contaminated surface soil at Action Areas USS-F and USS-K. Approximately 44 cubic yards of soil would be removed from the

action area. The soil would be excavated and transported off-site to an EPA-approved disposal facility in the Lower 48. Excavation backfill material would be obtained from an approved borrow source that meets the analytical requirements for backfill material. Following excavation, disposal, and backfilling, no further surface soil contamination would remain on-site above PCLs. Five-Year Reviews would not need to be conducted.

Alternative LSS-1 – No Action

Under this alternative, no remedial actions would be taken, no monitoring would be conducted, and LUCs would not be implemented to prevent exposures. Although natural attenuation would occur, contaminant reductions would not be verified with monitoring. Abandonment of existing LSS groundwater monitoring wells would need to be considered if no remedial actions are taken.



Upper Site Summit

Alternative LSS-2 – Surface and Subsurface Soil Excavation with Off-site Disposal

Alternative LSS-2 would excavate all surface and subsurface soil with contamination exceeding PCLs. Excavations would be completed to bedrock, or to the depth at which the deepest soil contamination has been detected. This alternative would rapidly remove contaminated soil from Action Areas LSS-B, LSS-H, LSS-Q and LSS-U. A total of about 230 cubic yards of impacted soil would be excavated. Excavated soil will be transported off-site to an EPA-approved disposal facility for CERCLA waste. Following excavation, disposal, and backfilling, no further surface or subsurface soil contamination would remain on-site above PCLs. Five-Year Reviews would not need to be conducted.

Alternative LSS-3 – Surface Soil Excavation with Off-site Disposal and LUCs

Alternative LSS-3 incorporates many components of Alternative LSS-2, except for subsurface soil. At Action Area Q, only the surface soil would be excavated, with clean fill being used to cover the remaining contaminated subsurface soil. This alternative would implement LUCs to restrict exposure to any remaining contaminated soils. Surface soil with contamination exceeding PCLs would be excavated and disposed of off-site. Approximately 163 cubic yards of impacted surface soil would be excavated and transported off-site for disposal. Contaminated subsurface soil would remain in place at LSS-Q under this alternative and LUCs would restrict excavation and removal of subsurface soils to prevent human exposure to contamination, and to prevent contaminated soils from being placed in sensitive environmental locations where ecological damage may occur. Subsurface soil contamination is expected to breakdown naturally over time. Based on available site-specific information, there is no estimate of time for these contaminants to achieve PCLs for the purposes of cost estimation; a 30-year time frame is being used to reach their PCL.



Lower Site Summit

EVALUATION OF REMEDIAL ALTERNATIVES

Different remedial alternatives were evaluated individually and against each other based on nine criteria identified in the NCP. The results of this evaluation are used to identify a *Preferred Alternative*. The relative performance of each alternative when compared to the nine criteria, and how it compares to the other alternatives under consideration are discussed below. The nine evaluation criteria are explained in Table 4.

A detailed analysis of alternatives can be found in the SFS. Tables 5 and 6 of this Proposed Plan present the cleanup alternatives for USS and LSS, respectively, at SS047 using the nine evaluation criteria detailed below.

- Overall Protection of Human Health and the Environment All of the alternatives, except for No Action, would provide adequate protection of human health and the environment by eliminating, reducing, or controlling risk through treatment and/or land use controls.
- 2. Compliance with ARARs All alternatives, except for No Action, would meet their respective state and federal ARARs.
- 3. Long-Term Effectiveness and Permanence -
 - No Action: This alternative is not effective in providing protectiveness to humans or the environment and is rated Low for this Criteria (Tables 5 and 6).
 - **USS:** Alternative USS-2 would remove all COCs in the soil above their respective PCLs permanently from site, and is rated High for this criterion (Table 5).
 - LSS: Alternative LSS-2 would remove all COCs in the soil above their respective PCLs permanently from site, and is rated High for this criterion. LSS-3 would leave subsurface COCs in place and require LUCs to maintain protectiveness so is rated Medium (Table 6).

| | THRESHOLD CRITERIA |
|---|--|
| Overall Protectiveness of Hun or controls threats to public hea | nan Health and the Environment determines whether an alternative eliminates, reduces Ith and the environment. |
| Compliance with applicable o meets Federal and State enviro a waiver is justified. | r relevant and appropriate requirements (ARARs) evaluates whether the alternative nmental statutes, regulations, and other requirements that pertain to the site, or whether |
| | PRIMARY BALANCING CRITERIA |
| Long-term Effectiveness and and the environment over time. | Permanence considers the ability of an alternative to maintain protection of human health |
| Reduction of Toxicity, Mobility treatment to reduce the harmful of contamination present. | y, or Volume of Contaminants through Treatment evaluates an alternative's use of effects of principal contaminants, their ability to move in the environment, and the amount |
| Short-term Effectiveness consposes to workers, residents, and | siders the length of time needed to implement an alternative and the risks the alternative d the environment during implementation. |
| Implementability considers the such as the relative availability of | technical and administrative feasibility of implementing an alternative, including factors of goods and services. |
| Cost includes estimated capital value is the total cost of an alter accurate within a range of +50 t | and annual operations and maintenance costs, as well as net present value. Net present native over time in terms of today's dollar value. Cost estimates are expected to be o -30 percent. |
| | MODIFYING CRITERIA |
| State/Support Agency Accepta Proposed Plan. | ance considers whether the State agrees with the preferred alternative identified in the |
| Community Acceptance consi Proposed Plan. Comments rec | ders whether the local community agrees with the preferred alternative identified in the eived on the Proposed Plan are an important indicator of community acceptance. |

4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment -

• **No Action:** This alternative does not reduce or contain harmful effects from COCs and is rated Low for this criterion (Tables 5 and 6).

• **USS:** Alternative USS-2 would remove contaminants in the surface soil and subsurface soil from the site, but only by relocating them. This alternative is rated Low for this criterion (Table 5).

• LSS: Alternative LSS-2 would remove all contaminants in the surface and subsurface soil from site, but by relocating them. Alternative LSS-3 would remove all contaminants in the surface soil by relocating them, but contamination would remain in place within the subsurface soil. Both alternatives are rated Low for this criterion (Table 6).

5. Short Term Effectiveness -

• **No Action:** This alternative is not effective in reducing harmful effects from the COCs. However, during implementation, no action has no negative impacts on construction workers or the environment. This Alternative is rated Medium for this criterion (Tables 5 and 6).

• **USS**: Alternative USS-2 can be readily implemented and completed over a relatively short time frame (single construction season). These alternatives would utilize methodology that prevents risk to human health and the environment during remedial activities. This alternative is rated High for this criterion (Table 5).

• LSS: Alternative LSS-2 and LSS-3 can be readily implemented and completed over a relatively short time frame (single construction season). Both alternatives would utilize methodology that prevents risk to human health and the environment during remedial activities. These alternatives are rated High for this criterion (Table 6).

| Table 5USS Remedial Alternative Comparison | | | | | |
|--|--|--|--|--|--|
| | Alternative USS-1 | Alternative USS-2 | | | |
| Evaluation Criteria | No Action | Excavation and off-site disposal of surface soil | | | |
| Estimate Volume (cubic yards) | NA | 44 | | | |
| Evaluation Criteria | | | | | |
| Protection of Human Health and the Environment | Fail | Pass | | | |
| Compliance with ARARs | Fail | Pass | | | |
| Long-Term Effectiveness and Permanence | Low | High | | | |
| Reduction of TMV through Treatment | Low | Low | | | |
| Short-Term Effectiveness | Medium | High | | | |
| Implementability | High | High | | | |
| Estimated Costs | | | | | |
| Capital Costs | \$0 | \$147,000 | | | |
| NPV at 2% | \$0 | \$147,000 | | | |
| NPV at 5% | \$0 | \$147,000 | | | |
| Estimated Construction Timeframe | 0 years | 1 year | | | |
| Estimated Time to Achieve Remedial Action Objectives | NA | 1 year | | | |
| Key: % – percent ARAR – applicable or relevant and appropriate requirement NA – not applicable NPV – net present value TMV – toxicity, mobility, and volume USS – Upper Site Summit | Scoring: Pass – meets thre: Fail – does not me High, Medium, and which the Alter | shold criterion et threshold criterion I Low indicate the degree to native satisfies the criterion. | | | |



6. Implementability -

• No Action: This alternative can be readily implemented. This alternative is rated High for this criterion (Tables 5 and 6).

• **USS:** Alternative USS-2 can be readily implemented, access is good, and excavation equipment and disposal facilities are available. This alternative is rated High for this criterion (Table 5).

• LSS: Alternatives LSS-2 and LSS-3 can be readily implemented, access is good, and excavation equipment and disposal facilities are available. Alternative LSS-2 is rated High for this criterion. Alternative LSS-3 is rated Medium because LSS-3 would leave contamination in place, thereby requiring monitoring (Table 6).

- Cost Costs are broken down to analyze the capital costs, annual operations and maintenance, and the net present value (NPV) of all expected costs.
 - **USS:** Costs for all alternatives at USS are presented in Table 5: Alternative USS-1 has the lowest estimated NPV, while Alternative USS-2 has the highest estimated NPV.
 - LSS: Costs for all alternatives at LSS are presented in Table 6. Alternative LSS-1 has the lowest estimated NPV, while Alternative LSS-3 has the highest estimated NPV.
- 8. State / Support Agency Acceptance EPA and ADEC have both participated in the development of this Proposed Plan. Their final acceptance will be evaluated following the public comment period.
- **9. Community Acceptance** Community acceptance of the preferred alternatives will be evaluated after the public comment period ends. Community comments and responses will be included in the ROD for SS047.

| Table 6LSS Remedial Alternative Comparison | | | | | | |
|---|----------------------|--|--|--|--|--|
| | Alternative LSS-1 | Alternative LSS-2 | Alternative LSS-3 | | | |
| Description | No Action | Surface and subsurface soil excavation and off-site disposal | Surface soil excavation and off-site disposal and LUCs subsurface soil | | | |
| Estimate Volume (cubic yards) | NA | 230 | 163 | | | |
| Evaluation Criteria | Evaluation Criteria | | | | | |
| Protection of Human Health and the Environment | Fail | Pass | Pass | | | |
| Compliance with ARARs | Fail | Pass | Pass | | | |
| Long-Term Effectiveness and Permanence | Low | High | Medium | | | |
| Reduction of TMV through Treatment | Low | Low | Low | | | |
| Short-Term Effectiveness | Medium | High | High | | | |
| Implementability | High | High | Medium | | | |
| Estimated Costs | | | | | | |
| Capital Costs | \$0 | \$371,000 | \$321,000 | | | |
| NPV at 2% | \$0 | \$371,000 | \$518,000 | | | |
| NPV at 5% | \$0 | \$371,000 | \$451,000 | | | |
| Estimated Construction Timeframe | 0 years | 1 year | 1 year | | | |
| Estimated Time to Achieve Remedial Action Objectives | NA | 1 year | 30 years | | | |
| Key: Scoring: % - percent LSS - Lower Site Summit Pass - meets threshold criterion ARAR - applicable or relevant and appropriate requirement NA - not applicable Fail - does not meet threshold criterion LUC - land use control TMV - toxicity, mobility, and volume High, Medium, and Low indicate the degree to which the Alternative satisfies the criterion. | | | | | | |

PREFERRED ALTERNATIVES

The Preferred Alternatives are expected to achieve substantial and long-term risk reduction through excavation and off-site disposal of all material above PCLs, at a reasonable cost. The alternatives provide active remediation to the area that has the highest risk and is relatively simple to implement. The Preferred Alternatives and a brief synopsis of why they are proposed are presented below.

USS – Alternative USS-2, Excavation and off-site disposal of surface soil. Surface soil contamination is limited primarily to two specific point releases and is relatively small in area (Action Area USS- F and USS-K). There is no subsurface soil contamination at USS. Therefore, excavation of surface soil and off-site disposal is the preferred alternative.

LSS – Alternative LSS-2, Excavation and off-site disposal of surface and subsurface soil. Surface soil contamination at LSS is associated primarily with localized releases at LSS-B, LSS-H, LSS-Q, and LSS-U. Subsurface contamination is present in the vicinity of action area LSS-Q, the launch control building. Therefore, excavation of surface and subsurface soil and off-site disposal is the preferred alternative.

Based on the information currently available, the Preferred Alternatives meet the threshold criteria (Criteria 1 and 2) and provide the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The USAF expects the Preferred Alternatives to satisfy the following statutory requirements of CERCLA §121(b):

- Be protective of human health and the environment.
- Comply with ARARs.
- Be cost effective.
- Utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.
- The preferred alternative is not to destroy the COCs but to transport contaminated soil for off-site disposal. The disposal facility will be out of state because there are no suitable facilities in Alaska.

The Preferred Alternatives can change in response to public comment or new information.



Aerial View of Upper Site Summit (circa 2005)

GLOSSARY

Applicable or Relevant and Appropriate Requirements (ARARs): Any state or federal statute that pertains to protection of human health and the environment in addressing specific conditions or use of a particular cleanup technology at a CERCLA site.

Chemicals of Concern (COCs): Hazardous substances, pollutants, and contaminants that, at the end of the risk assessment, are found to be the risk drivers or those that may actually pose unacceptable human or ecological risks. The COCs typically drive the need for a remedial action.

Community Environmental Board (CEB): A committee of community members who want to be involved in the cleanup activities at Department of Defense sites, such as JBER. This provides a forum for public involvement on environmental restoration, compliance, natural resources, and cultural resources issues on JBER.

Exposure Pathway: The course a chemical or physical agent takes from a source to an exposed organism. An exposure pathway describes a unique mechanism by which an individual or population is exposed to chemicals or physical agents at or originating from a site. Each exposure pathway includes a source or release from a source, an exposure point, and an exposure route. If the exposure point differs from the source, a transport/exposure medium (e.g., air) or media (in cases of intermedia transfer) also is included.

Hazard Index (HI): The sum of more than one hazard quotient (HQ) for multiple substances and/or multiple exposure pathways. The HI is calculated separately for chronic, subchronic, and shorter-duration exposures .

Hazard Quotient (HQ): The ratio of a single substance exposure level over a specified time period (e.g., subchronic) to a reference dose for that substance derived from a similar exposure period for a non-cancer risk.

Incremental Lifetime Cancer Risk (ILCR): A measurement of the likelihood that one additional person above the national average will develop cancer from exposure to contamination. ILCR is based on an average daily dose, averaged over a lifetime, and multiplied by the cancer slope factor.

Net Present Value (NPV): The current value of money estimated to be necessary to complete a remedial action. This includes both capital and operation and maintenance costs estimated from start to finish of the action.

Preferred Alternative: The alternative which best meets the RAOs and is deemed most appropriate taking into consideration the nine criteria for evaluating cleanup alternatives identified in the NCP.

Remedial Action Objectives (RAOs): Specific goals developed for protecting human health and the environment at a site.



Lower Site Summit Overview

WHERE DO I GET MORE INFORMATION?

This Proposed Plan for SS047 summarizes information contained in the RI, FS and SFS. All site-related documents are provided in the Administrative Record file, which is the official collection of all site-related documents, correspondence, and other information. You may review a copy of the Administrative Record file by visiting the Information Repository that JBER maintains in the Anchorage community:

Alaska Resources Library and Information Services (ARLIS) University of Alaska Anchorage (UAA) Consortium Library

3211 Providence Drive Anchorage, Alaska 99508

(907) 27-ARLIS or 272-7547 reference@arlis.org

Hours: Mon - Fri, 8am - 5pm

Another source of information on the environmental cleanup process is the JBER **Community Environmental Board** (CEB). The CEB is a group of community volunteers who act as a focal point for exchange of information about environmental cleanup issues. The CEB has been meeting since April 2003 to discuss subjects such as the investigations and the cleanup strategies for sites on JBER. The public is welcome to attend these meetings. Please contact the Environmental Community Relations Coordinator at the number shown below for information on the CEB.

Additional information about cleanups at JBER can be found on the base's public web site. The address for the Environmental Restoration page is: <u>http://www.jber.af.mil/environmental/restoration.asp.</u>

A comment form is provided with this Proposed Plan, however to submit comments it is not a requirement. Please send written comments to the Environmental Community Relations Coordinator.

Environmental Community Relations Coordinator, 673d Air Base Wing Public Affairs (673 ABW/PA), 10480 Sijan Ave. Suite 123, JBER, AK 99506, or e-mail to jber.pa.3@us.af.mil.

For more information, call Mr. Jim Hart, Environmental Community Relations Coordinator at 552-8152.

PUBLIC MEETING:

The public meeting is scheduled from 7:00 pm to 8:30 pm on Wednesday, October 19, 2016, at the Fairview Community Recreation Center, located at 1121 East 10th Avenue in Anchorage, Alaska. Representatives from the USAF will be present to discuss the Proposed Plan and answer questions.



COMMUNITY PARTICIPATION

We invite you to comment on this Proposed Plan. Comments from the public will be used to help determine what remedial action to take. You may comment verbally, or in writing, at the public meeting on October 19, 2016. If you prefer, you may submit written comments during the public comment period, October 3, 2016 through November 3, 2016, by sending them to:

Environmental Community Relations Coordinator, 673d Air Base Wing Public Affairs (673 ABW/PA), 10480 Sijan Ave. Suite 123, JBER, AK 99506, or e-mail to **jber.pa.3@us.af.mil.**

After considering public comments, the USAF, in consultation with EPA and ADEC, will select the final cleanup remedies. The preferred cleanup remedy may be modified based on public comment or new information. The chosen cleanup remedy will be described in the ROD. The USAF will respond to your comment(s) in the ROD, in a section called the Responsiveness Summary. The ROD will be available for your review at the information repository listed above once the ROD has been signed.