



**RECORD OF DECISION  
OB942 OPEN BURN AREA  
MILITARY MUNITIONS RESPONSE  
PROGRAM**

**CAPE ROMANZOF LONG-RANGE  
RADAR SITE, ALASKA**

**FINAL  
2017**

**RECORD OF DECISION  
OB942 OPEN BURN AREA  
MILITARY MUNITIONS RESPONSE PROGRAM**

**CAPE ROMANZOF LONG-RANGE RADAR  
SITE, ALASKA**

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**Prepared for**



**PACAF Regional Support Center  
Joint Base Elmendorf-Richardson, Alaska**

**FINAL  
2017**

## TABLE OF CONTENTS

<b><u>SECTION</u></b>	<b><u>PAGE</u></b>
ACRONYMS AND ABBREVIATIONS .....	v
PART 1: DECLARATION .....	1-1
1.1 SITE NAME AND LOCATION .....	1-1
1.2 STATEMENT OF BASIS AND PURPOSE .....	1-2
1.3 ASSESSMENT OF THE SITE .....	1-7
1.4 DESCRIPTION OF THE SELECTED REMEDY .....	1-7
1.5 STATUTORY DETERMINATIONS .....	1-8
1.6 DATA CERTIFICATION CHECKLIST .....	1-9
1.7 AUTHORIZING SIGNATURES .....	1-11
PART 2: DECISION SUMMARY .....	2-1
2.1 SITE NAME, LOCATION, AND DESCRIPTION .....	2-1
2.1.1 Regional Setting .....	2-2
2.1.2 Site Description .....	2-3
2.1.3 Facility Military Munitions Response Program History .....	2-3
2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES .....	2-7
2.3 COMMUNITY PARTICIPATION .....	2-7
2.4 SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION .....	2-8
2.5 SITE CHARACTERISTICS .....	2-8
2.5.1 Topography .....	2-9
2.5.2 Climate .....	2-9
2.5.3 Geology .....	2-9
2.5.4 Surface and Subsurface Hydrology .....	2-10
2.5.5 Ecology .....	2-10
2.5.6 Previous Site Characterization Activities .....	2-11
2.5.7 Nature and Extent of Contamination .....	2-11
2.6 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES .....	2-17
2.6.1 Land Use .....	2-17
2.6.2 Groundwater and Surface Water Uses .....	2-17
2.7 SUMMARY OF SITE RISKS .....	2-17
2.7.1 Human Health Risks .....	2-18

## TABLE OF CONTENTS (Continued)

<b><u>SECTION</u></b>	<b><u>PAGE</u></b>
2.7.2 Ecological Risks .....	2-20
2.7.3 Basis for Action .....	2-21
2.8 REMEDIAL ACTION OBJECTIVES .....	2-21
2.9 DESCRIPTION OF ALTERNATIVES .....	2-21
2.9.1 Description of Remedy Components .....	2-24
2.10 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES .....	2-26
2.10.1 Overall Protection of Human Health and the Environment .....	2-29
2.10.2 Compliance with Applicable or Relevant and Appropriate Requirements.....	2-29
2.10.3 Long-Term Effectiveness and Permanence .....	2-30
2.10.4 Reduction of Toxicity, Mobility, or Volume through Treatment .....	2-31
2.10.5 Short-Term Effectiveness.....	2-31
2.10.6 Implementability .....	2-32
2.10.7 Relative Cost .....	2-33
2.10.8 State/Support Agency and Land Manager Acceptance.....	2-34
2.10.9 Community Acceptance .....	2-34
2.11 PRINCIPAL THREAT WASTES .....	2-35
2.12 SELECTED REMEDY .....	2-35
2.12.1 Remedy Implementation .....	2-36
2.12.2 Summary of the Rationale for the Selected Remedy .....	2-36
2.12.3 Description of the Selected Remedy .....	2-36
2.12.4 Summary of Estimated Remedy Costs.....	2-38
2.12.5 Expected Outcomes of the Selected Remedy.....	2-39
2.13 STATUTORY DETERMINATIONS .....	2-39
2.13.1 Protection of Human Health and the Environment .....	2-40
2.13.2 Compliance with Applicable or Relevant and Appropriate Requirements.....	2-40
2.13.3 Cost Effectiveness.....	2-40
2.13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies .....	2-40
2.13.5 Preference for Treatment as a Principal Element.....	2-41

## TABLE OF CONTENTS (Continued)

<b><u>SECTION</u></b>	<b><u>PAGE</u></b>
2.13.6 Five-Year Review Requirements .....	2-41
2.14 DOCUMENTATION OF SIGNIFICANT CHANGES .....	2-42
PART 3: RESPONSIVENESS SUMMARY .....	3-1
3.1 ORAL AND WRITTEN COMMENTS AND RESPONSES .....	3-1
3.2 TECHNICAL / LEGAL ISSUES .....	3-2
PART 4: REFERENCES.....	4-1

## TABLES

Table 1-1	Project Details .....	1-1
Table 2-1	Project Information .....	2-1
Table 2-2	Human Health Conceptual Site Model .....	2-15
Table 2-3	Ecological Conceptual Site Model .....	2-16
Table 2-4	Summary of Medium-Specific Primary Exposure Concentrations.....	2-20
Table 2-5	Summary of Remedial Alternatives Evaluated for OB942.....	2-23
Table 2-6	Screening of Alternatives for OB942.....	2-28
Table 2-7	OB942 Alternatives Cost Summary.....	2-34
Table 2-8	Capital and O&M Cost Estimates for the Selected Remedy.....	2-39
Table 2-9	Cost and Effectiveness Summary.....	2-41

## FIGURES

Figure 1-1	Location and Vicinity Map Cape Romanzof LRRS OB942 .....	1-3
Figure 1-2	OB942 Open Burn Area Site Map and National Wetlands Inventory .....	1-5
Figure 2-1	OB942 Open Burn Area 2011 Analytical Lead and Antimony Results .....	2-5

## APPENDICES

Appendix A	Applicable or Relevant and Appropriate Requirements
Appendix B	Conceptual Site Model
Appendix C	Community Participation
Appendix D	Responses to Comments

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## ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
611 CES	611th Civil Engineer Squadron
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AFCEC	Air Force Civil Engineer Center
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
COC	chemical of concern
COPC	chemical of potential concern
CSE	Comprehensive Site Evaluation
CSM	conceptual site model
cy	cubic yard
CZOP	Operations Division
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DNR	State of Alaska Department of Natural Resources
DoD	U.S. Department of Defense
Eco-SSL	ecological soil screening level
EPA	U.S. Environmental Protection Agency
ERP	Environmental Restoration Program (formerly the Installation Restoration Program [IRP])
FS	Feasibility Study
HHRA	human health risk assessment
LRRS	Long-Range Radar Site
LTM	long-term monitoring
LUC	land-use control
MC	munitions constituent
MEC	munitions and explosives of concern
mg/kg	milligrams per kilogram
MMRP	Military Munitions Response Program
MRA	munitions response area
NCP	National Contingency Plan

## **ACRONYMS AND ABBREVIATIONS (Continued)**

NWR	National Wildlife Refuge
O&M	operations and maintenance
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
TSDF	treatment, storage, and disposal facility
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
UU/UE	unlimited use and unrestricted exposure
WACS	White Alice Communications System



## **PART 1: DECLARATION**

### **1.1 SITE NAME AND LOCATION**

OB942 Open Burn Area is part of the Cape Romanzof Long-Range Radar Site (LRRS). The LRRS installation is located approximately 560 miles west of Anchorage and 165 miles northwest of Bethel, Alaska. The nearest local communities are Scammon Bay and Hooper Bay, which are located approximately 15 miles east and south of the installation, respectively (Figure 1-1). Cape Romanzof LRRS comprises two distinct areas: the Upper Camp, situated on Towak Mountain, and the Lower Camp, where the main facilities are located. There is a tramway that formerly connected the two camps; the areas are now connected by a road (U.S. Army Corps of Engineers [USACE] 2013).

OB942 is an area where military personnel disposed of small arms ammunition by burning. The area is located approximately 1,500 feet east of the runway and approximately 100 feet south of the access road to the Lower Camp. OB942 consists of open, rocky tundra with sparse vegetation. OB942 is identified as a munitions response area (MRA) due to the presence of burned .30 and .50 caliber rounds (USACE 2013). Features include evidence of one or more burn piles with shell casings and projectiles scattered on the open ground and among the rocks and vegetation. Several rusting metal drums are also present. The location of OB942 is shown on Figure 1-2.

**Table 1-1  
Project Details**

<b>Facility Name:</b>	Cape Romanzof LRRS, Alaska
<b>Site Location</b>	165 miles northwest of Bethel, Alaska Section 33; Township 20N, Range 92W Seward Meridian
<b>Latitude and Longitude:</b>	61°47'8.4228"N, 166°1'0.084"W
<b>CERCLIS ID Number:</b>	Not listed
<b>ADEC Contaminated Sites Hazard ID Number</b>	26372
<b>Operable Unit/Site:</b>	OB942

**Note:**

For definitions, refer to the Acronyms and Abbreviations section.

## 1.2 STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the selected remedy for the Military Munitions Response Program (MMRP) site OB942 at the Cape Romanzof LRRS. This remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and, to the extent practicable, with the National Contingency Plan (NCP) (Title 40 of the Code of Federal Regulations [CFR], Part 300 et seq. [40 CFR 300 et seq.]). This decision is based on the Administrative Record file for Cape Romanzof LRRS, which can be accessed at the following website:

<http://afcec.publicadmin-record.us.af.mil/Search.aspx>

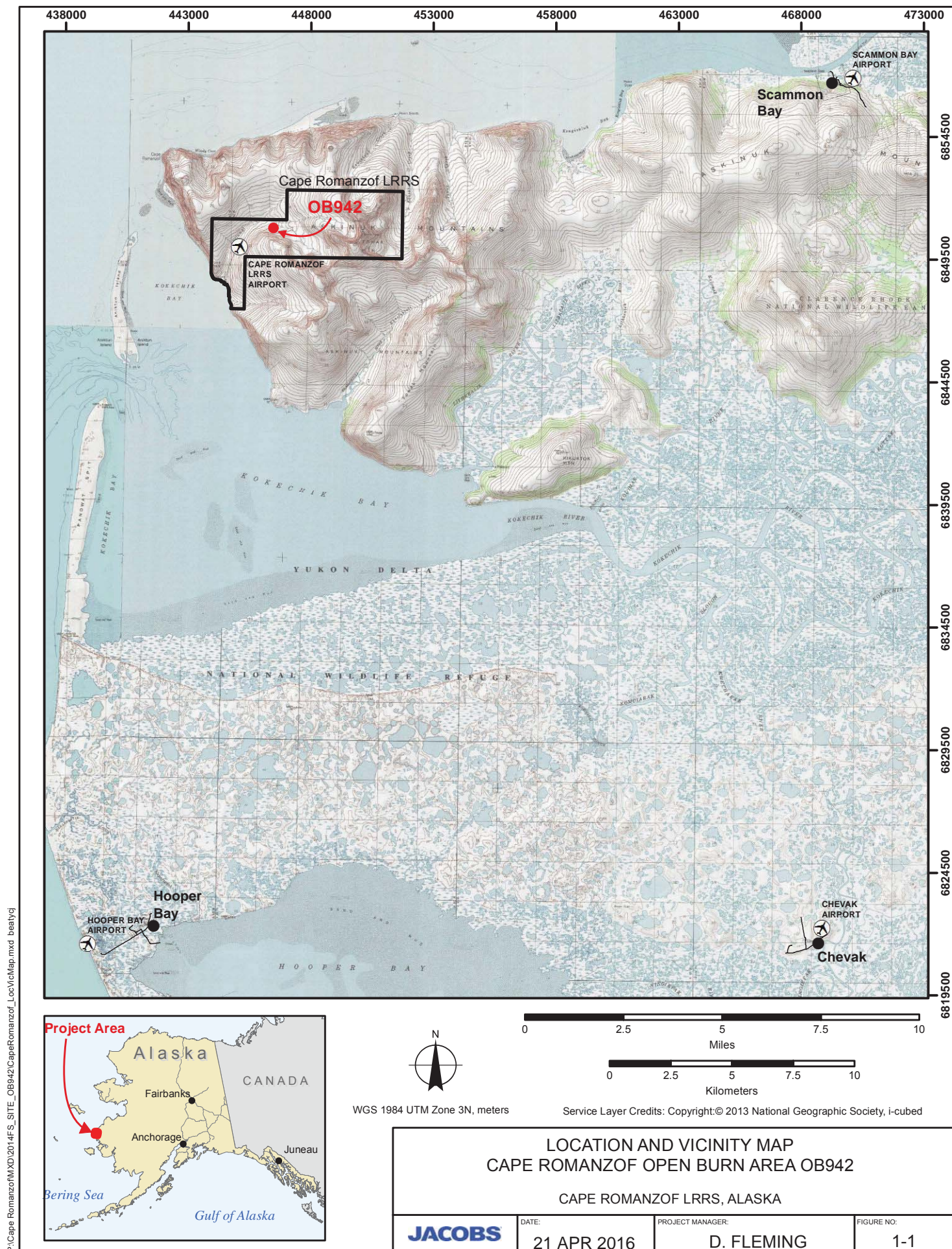
Remedial alternatives were chosen for consideration and are further evaluated in the *Proposed Plan for OB942 Open Burn Area* (U.S. Air Force [USAF] 2016). As the lead agency, the USAF has selected land-use controls (LUCs) as the remedy for OB942.

Pursuant to the Defense Environmental Restoration Program (DERP), as defined in Title 10 U.S. Code (USC) §2701(a) [10 USC 2701(a)], the Air Force is implementing a MMRP. CERCLA is the U.S. Department of Defense (DoD) preferred response mechanism for addressing munitions in accordance with a DoD and U.S. Environmental Protection Agency (EPA) Memorandum *Interim Final Management Principles for Implementing Response Actions at Closed, Transferring, and Transferred Ranges* (DoD and EPA 2000).

The USAF is issuing this ROD under its CERCLA lead agency authority. This ROD is issued in accordance with and satisfies requirements of DERP (10 USC 2701 et seq.); CERCLA (42 USC 9601 et seq.); and Executive Order 12580. Site remediation will be funded under the Defense Environmental Restoration Account (DERA).

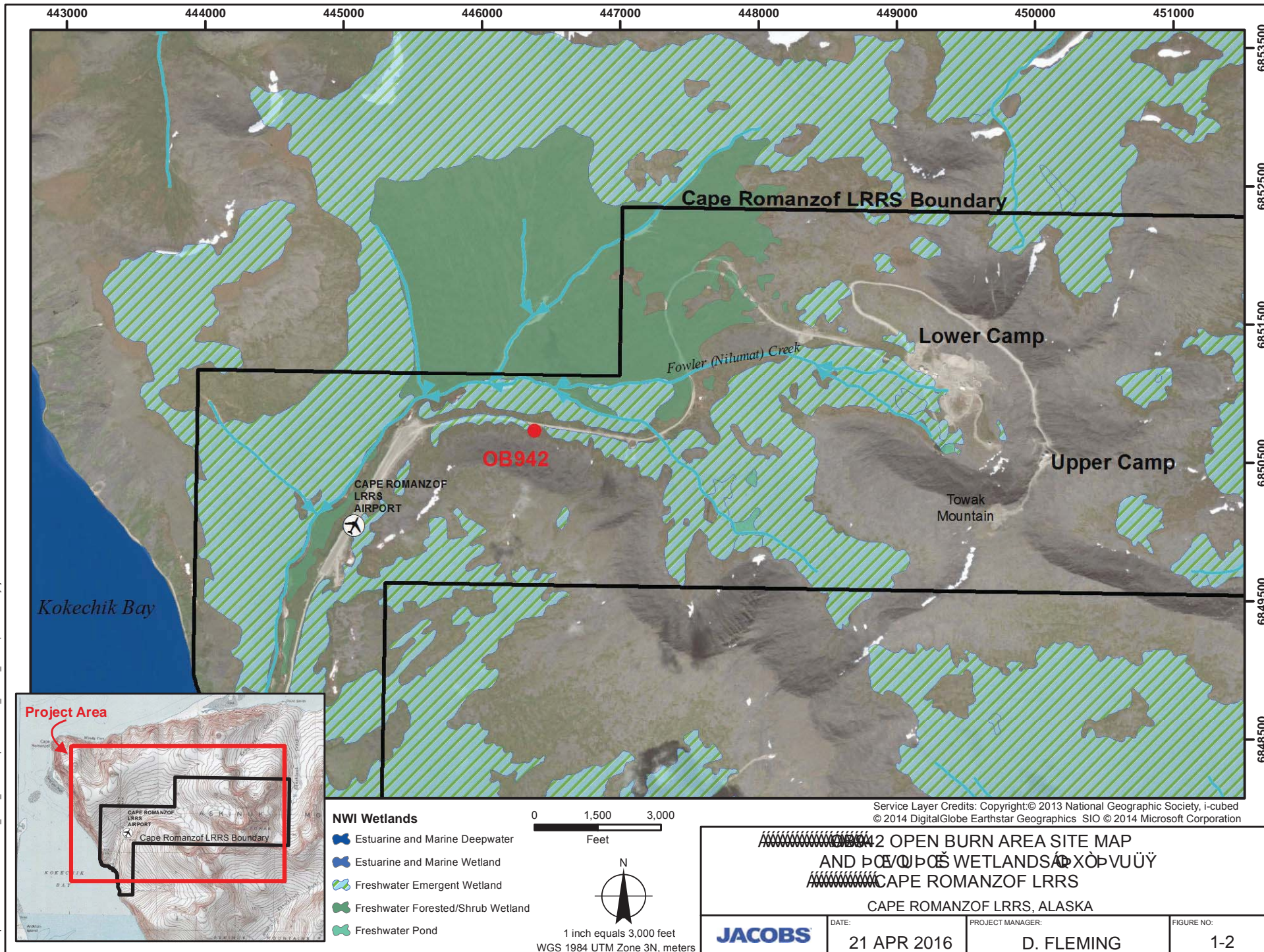
For the Cape Romanzof LRRS, EPA has delegated its CERCLA regulatory agency authority to Alaska Department of Environmental Conservation (ADEC). ADEC is the regulatory agency for this project. ADEC concurs that, if properly implemented, the selected remedy for OB942 will comply with State of Alaska regulatory requirements.





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### 1.3 ASSESSMENT OF THE SITE

OB942 was identified as a potential MRA during a 2011 historical records review. Based on further records review, field reconnaissance, and visual surveys summarized in *Cape Romanzof Long-Range Radar Site Comprehensive Site Evaluation Phase I/II*, the Air Force Civil Engineer Center (AFCEC) concluded that OB942 is an open burn area and eligible for investigation under the USAF MMRP (USACE 2013). This area is further described in Section 2.1.2.

The primary chemicals of concern (COCs) at OB942 are munitions constituents (MCs) associated with small arms debris. During the Comprehensive Site Evaluation (CSE) Phase I/II, soil was sampled and analyzed for metals associated with small-caliber ammunition (lead and antimony) that appear to have been burned onsite (USACE 2013). Analytical results indicated that lead concentrations ranged from 7.3 to 13 milligrams per kilogram (mg/kg), which is below the ADEC Method Two soil cleanup level (400 mg/kg). Antimony was not detected at OB942. Only small arms debris was observed during the visual survey. There was no evidence of historical use of explosives and no munitions and explosives of concern (MEC) were observed during the CSE Phase I/II; however, their presence cannot be ruled out. Subsurface anomalies were detected with a metal detector.

The response action selected in this ROD is necessary to protect human health or welfare or the environment from actual or threatened releases of pollutants or contaminants (i.e. small arms debris, subsurface anomalies, MCs in uncharacterized areas) from this site, which may present an imminent and substantial endangerment to public health or welfare.

### 1.4 DESCRIPTION OF THE SELECTED REMEDY

Remedial alternatives for OB942 were developed and evaluated in the *Feasibility Study for OB942 Cape Romanzof Long-Range Radar Site* (USAF 2015b) and presented in the 2016 Proposed Plan (USAF 2016). Based on the regulatory support agency comments received during the development of the Proposed Plan, the USAF selected LUCs as the overall site remedy.

LUCs will be implemented to restrict invasive and residential activities and protect human health from exposure to small arms debris, which is known to be present onsite. Additionally, this remedy will eliminate the physical exposure hazards presented by the potential presence of MEC and munitions debris as well as the chemical hazards associated with any unidentified MCs in areas that were not sampled. MCs are defined as materials originating from unexploded ordnance, discarded military munitions, or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions [10 USC 2710(e)(3)].

The major components of the LUCs to be implemented at OB942 are as follows:

- Restrict invasive and residential activities and exposure to MCs associated with small arms debris via dig restrictions and signage.
- File a notice of environmental contamination with the USAF real property office and with State of Alaska Department of Natural Resources (DNR) land records.
- Add OB942 to the LUC management plan for Pacific Air Forces Regional Support Center installations.
- CERCLA five-year reviews will be required.

If properly implemented at OB942, LUCs will be protective of human health and the environment. No source materials constituting principal threat wastes exist at OB942.

## **1.5 STATUTORY DETERMINATIONS**

Alternative 2 – LUCs, the selected remedy for OB942, is protective of human health and the environment, complies with federal and state requirements that are Applicable or Relevant and Appropriate (ARARs) to the remedial action (unless justified by a waiver), is cost-effective, and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. The selected remedy for OB942 does not satisfy the statutory preference for treatment because it will not permanently or significantly reduce the toxicity, mobility, or volume of COCs at the site. The selected remedy for OB942 was chosen because the remoteness of the location and unlikely presence of human and ecological receptors make the implementation of treatment technologies costly and impractical. CERCLA five-year reviews will be required to ensure that the remedy is, or will



be, protective of human health and the environment. Small arms debris is known to be present onsite, and will remain onsite indefinitely. It is possible that MEC, munitions debris, and MCs pertaining to uninvestigated subsurface anomalies are present and will remain onsite above levels that allow for unlimited use and unrestricted exposure (UU/UE).

## **1.6 DATA CERTIFICATION CHECKLIST**

The following information is included in the Decision Summary located in Part 2: of this ROD; additional information can be found in the Administrative Record file for this site (refer to Section 1.2):


- The COC/COPC and its respective concentrations (Section 2.7.1)
- Baseline human health and ecological risk evaluation represented by the COC (Section 2.7)
- Established cleanup levels and the basis for the selection (Sections 2.5.7 and 2.7.1)
- How source materials constituting principal threat wastes will be addressed (Section 2.11)
- Current and reasonably anticipated future land-use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD (Sections 1.1 and 2.7)
- Potential land and surface water use that will be available at the site as a result of the selected remedy (Sections 2.6.1 and 2.6.2)
- Estimated capital, annual operations and maintenance (O&M), total costs, and the number of years over which the remedy cost estimates are projected (Sections 2.10.7 and 2.12.4; Tables 2-7, 2-8, and 2-9)
- Key factors that led to selecting the remedy, including a description of how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision (Sections 2.10 and 2.12)

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## 1.7 AUTHORIZING SIGNATURES

This signature sheet documents the U.S. Air Force's approval of the remedy selected in this Record of Decision for OB942 at the Cape Romanzof Long-Range Radar Site, Alaska.

By signing this declaration, the Alaska Department of Environmental Conservation agrees that proper implementation of the selected remedy for OB942 will comply with state environmental laws. These decisions will be reviewed and may be modified in the future if information becomes available that indicates the presence of contaminants or potential exposures that present unacceptable risk to human health or the environment.

  
\_\_\_\_\_  
SUZANNE W. BILBREY, P.E., GS-15  
AFCEC/CZ Director, Environmental Management Directorate

31 Mar 17  
Date

  
\_\_\_\_\_  
KIM DERUYTER, DSMOA Section Manager  
Federal Facilities Section, Contaminated Sites Program  
Alaska Department of Environmental Conservation

28-Apr-17  
Date

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## PART 2: DECISION SUMMARY

The Decision Summary identifies the selected remedy, explains how the remedy fulfills statutory and regulatory requirements, and provides a substantive summary of previous investigations that support remedy selection.

### 2.1 SITE NAME, LOCATION, AND DESCRIPTION

The Cape Romanzof LRRS installation is located approximately 540 miles west of Anchorage on the Bering Sea coast. The nearest local communities are Scammon Bay (Population: 474, from the 2010 census) and Hooper Bay (Population: 1,014 from the 2000 census), which are located approximately 15 miles east and south of the installation, respectively (refer to Figure 1-1). Bethel is the closest town, located 165 miles to the southeast. The LRRS consists of 4,900 acres of land on the southwestern coast of Alaska in the Yukon-Kuskokwim Delta region within the Yukon Delta National Wildlife Refuge (NWR). OB942 consists of a single area within the LRRS: Open Burn Area; this area is described in greater detail in Section 2.1.2.

**Table 2-1  
Project Information**

<b>Facility:</b>	Cape Romanzof LRRS, Alaska
<b>Site Location:</b>	165 miles northwest of Bethel, Alaska Section 33; Township 20N, Range 92W Seward Meridian
<b>Latitude and Longitude:</b>	61°47'8.4228"N, 166°1'0.084"W
<b>CERCLIS ID Number:</b>	Not listed
<b>ADEC Contaminated Sites Hazard ID Number</b>	26372
<b>Operable Unit/Site:</b>	OB942
<b>Point of Contact:</b>	Mr. Richard J. Mauser – Remedial Project Manager richard.mauser@us.af.mil AFCEC/CZOP 10471 20 <sup>th</sup> Street, Suite 339 Joint Base Elmendorf-Richardson, AK 99506-2201 907-552-0788

**Note:**

For definitions, refer to the Acronyms and Abbreviations section.

Pursuant to the DERP, 10 USC 2701(a), the Air Force is implementing a MMRP. CERCLA is the DoD's preferred response mechanism for addressing munitions in accordance with a DoD and EPA Memorandum *Interim Final Management Principles for Implementing Response Actions at Closed, Transferring, and Transferred Ranges* (DoD and EPA 2000).

The Cape Romanzof LRRS is owned by USAF, which is issuing this ROD under its lead agency authority. As the regulatory support agency, ADEC provides primary oversight of the environmental restoration actions in accordance with State of Alaska contaminated sites regulations (Title 18 Alaska Administrative Code [AAC] 75, Article 3, *Discharge Reporting Cleanup and Disposal of Oil and Other Hazardous Substances* [18 AAC 75.300]) (ADEC 2016b).

The implementation of the selected remedy for OB942 will be funded by DERA, a funding source approved by Congress to clean up contaminated sites on DoD installations.

### **2.1.1 Regional Setting**

The Cape Romanzof LRRS comprises approximately 4,900 acres of land along the shore of the Bering Sea coast. It is approximately 540 miles west of Anchorage and 165 miles northwest of Bethel. The nearest local communities are Scammon Bay and Hooper Bay, which are located approximately 15 miles east and south of the installation, respectively. No roads connect Scammon Bay or Hooper Bay to the Cape Romanzof LRRS; it is accessible by air, by sea a few months in the summer, or by snowmachine in the winter. The USAF owns the Cape Romanzof LRRS and is responsible for environmental cleanup of the site.

The Cape Romanzof LRRS is divided into two areas, the Lower Camp where the main camp facilities (i.e., housing, power plant, and bulk fuel storage area) are located; and the Upper Camp where the long-range radar equipment is located (refer to Figure 1-2). The Upper Camp is located at the top of Towak Mountain at an elevation of approximately 2,300 feet above mean sea level; the Lower and Upper Camps are connected by a gravel road and former tramway service. A 1-mile-long gravel runway serving the installation is located near the

beach at Kokechik Bay, approximately 4 miles southwest of the Lower Camp by road. Fowler (Nilumat) Creek and its tributaries run through Cape Romanzof LRRS to Kokechik Bay. There is one small lake, which was formed by a small dam at the head of the valley at the Lower Camp (USACE 2013).

### **2.1.2 Site Description**

OB942 is located approximately 1,500 feet east of the runway and approximately 100 feet south of the access road to the Lower Camp and one of the branches of Fowler (Nilumat) Creek. OB942 consists of open, rocky tundra with sparse vegetation. Features include evidence of one or more burn piles with shell casings and projectiles scattered on the open ground and among the rocks and vegetation. Several rusting metal drums are also present (USACE 2013).

### **2.1.3 Facility Military Munitions Response Program History**

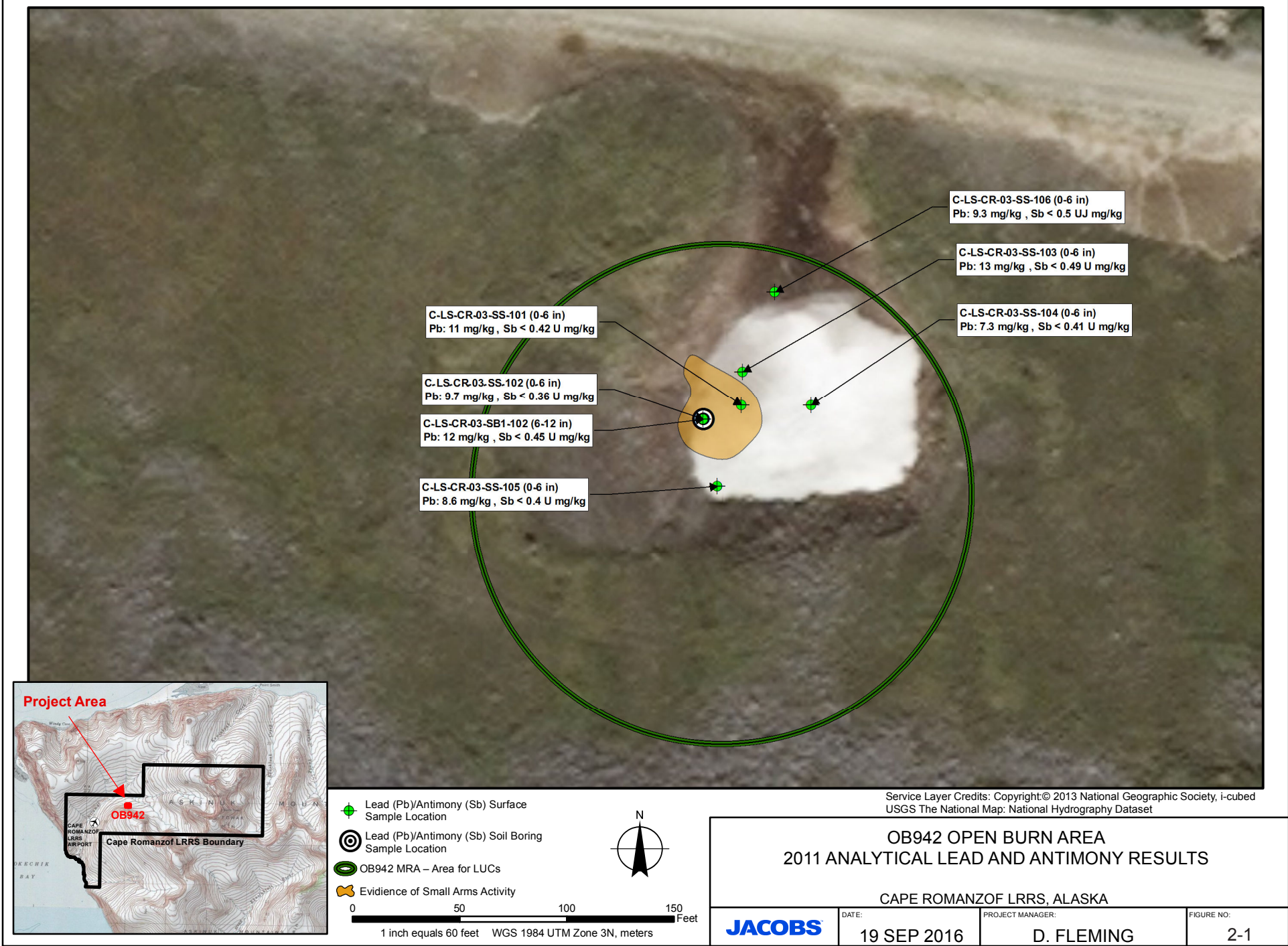
The DoD MMRP was initiated in 2001 to address munitions-related concerns, including explosive safety, environmental, and health hazards from releases of unexploded ordnance, discarded military munitions, and MCs found at locations other-than-operational ranges on active and inactive military installations and DoD Formerly Used Defense Sites. The MMRP addresses other-than-operational range lands with suspected or known hazards from MEC that occurred prior to September 2002, but are not already included with an Environmental Restoration Program (ERP) site cleanup activity.

OB942 is an open burn area. The USAF has identified small arms debris and unidentified anomalies as the main physical hazards posing potential risks to human health and the environment at OB942. Associated MCs present a chemical hazard that is within acceptable limits in characterized areas; analytical results indicated that lead is present in concentrations below the ADEC Method Two soil cleanup level of 400 mg/kg. Lead concentrations ranged from 7.3 mg/kg to 13 mg/kg and antimony results were undetected at OB942 (Figure 2-1). A combined CSE Phase I/II was performed at the Cape Romanzof LRRS in 2011. The CSE Phase I included a historical records review, visual reconnaissance, and interviews; the CSE

Phase II included a visual survey and environmental sampling. There was no evidence of historical use of explosives, and no MEC- or munitions debris-related items were observed during the CSE Phase I/II; however, their presence in the subsurface cannot be ruled out. Small arms debris was observed during the visual survey (USACE 2013). A separate site investigation for fuel-related contamination at OB942 was underway at the time this ROD was prepared (refer to Section 3.2).

Between 1989 and 2011, a number of environmental investigations and cleanup projects were conducted at the Cape Romanzof LRRS. A full description of previous environmental work conducted at the LRRS – including 17 ERP sites – can be found in the Administrative Record for the Cape Romanzof LRRS (refer to Section 1.2).





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## **2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES**

This section provides background information, summarizes the series of investigations that led to this ROD, and describes the CERCLA response actions previously undertaken at OB942.

Constructed in 1953, the Cape Romanzof LRRS was one of the original 12 Aircraft Control and Warning sites built in the 1950s in Alaska as part of an air defense communications system (USACE 2013). In 1958, a White Alice Communications System (WACS) was activated and operated until 1979. The Cape Romanzof WACS was deactivated and replaced by an Alascom-owned satellite earth terminal in 1979 (USACE 2013). USAF, the lead agency for remedial activities, has conducted environmental investigations at the Cape Romanzof LRRS since 1989. These activities were conducted in accordance with CERCLA under DERP (10 USC 2701 et seq.), which was established by §120 of SARA.

No Federal Facility Agreements or state agreements for the Cape Romanzof LRRS are in effect. None of the Cape Romanzof LRRS sites are listed on the National Priorities List. To date, there have been no regulatory enforcement activities at OB942.

## **2.3 COMMUNITY PARTICIPATION**

NCP §300.430(f)(3) establishes a number of public participation activities that the lead agency must follow, to include preparation of the Proposed Plan and review by the regulatory agency. In accordance with NCP requirements, the USAF distributed the *Proposed Plan for OB942 Open Burn Area* (USAF 2016) on 11 March 2016 to the villages of Scammon Bay, Hooper Bay, and Chevak for public review and to solicit public input. A notice regarding the availability of the Proposed Plan was published in the *Delta Discovery* on 16 and 23 March 2016. The 30-day public comment period for the Proposed Plan began on 11 March 2016 and ended on 11 April 2016. No public meeting was requested following distribution of the Proposed Plan, and only one comment was received during the 30-day public comment period.

The Proposed Plan (USAF 2016) and all newsletters, fact sheets, and community relations documents relating to the MMRP and ERP (formerly IRP) sites at the Cape Romanzof LRRS are located in an Administrative Record and a public information repository at Joint Base Elmendorf-Richardson. This information is included as part of the Administrative Record for the Cape Romanzof LRRS (refer to Section 1.2). More information regarding efforts to solicit community involvement in the OB942 decision-making process is provided in Appendix C.

## **2.4 SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION**

Under its lead agency authority, USAF plans to use LUCs in order to protect human receptors from encountering small arms debris, subsurface anomalies, and uncharacterized MCs. LUCs will be implemented to restrict invasive and residential activities. LUCs will include dig restrictions and signage, and the USAF will file a notice of environmental contamination with the USAF real property office and with DNR land records. Additionally, OB942 would be added to the LUCs Management Plan for Pacific Air Forces Regional Support Center Installations.

Physical hazards as well as the potential for additional MCs in uncharacterized areas will remain at OB942 for more than five years; therefore, CERCLA five-year reviews will be required indefinitely. The effectiveness of this remedy is dependent upon adequate enforcement, and continued protectiveness must be verified through regular monitoring.

## **2.5 SITE CHARACTERISTICS**

The installation is accessible only by air or boat (during summer), and snowmachine (during winter). The Cape Romanzof LRRS is centrally located in the western Askinuk Mountains and is bordered by native corporation lands. The LRRS is bordered on the north, south, and west by the Bering Sea and on the east by rugged terrain (USACE 2013). Natural site features and characteristics are described below.

### **2.5.1 Topography**

The Cape Romanzof LRRS is located on a mountain mass that rises steeply out of the Yukon-Kuskokwim Delta. The installation lies on a peninsula at the western end of the Askinuk Mountains. The Cape Romanzof LRRS sits in a glacially carved valley that is encircled by sheer bedrock ridges. The lowland is crossed by wandering creeks and a streambed that is nearly level, with sluggishly moving water that flows west into the Bering Sea (USAF 2011). Permafrost is not known to exist at the Cape Romanzof LRRS (USAF 2011).

The Upper Camp is situated on Towak Mountain, which steeply drops down into the valley. The valley is characterized by uneven terrain with flat and steep segments.

### **2.5.2 Climate**

Cape Romanzof LRRS has a maritime climate. Temperatures recorded at Cape Romanzof range from 4.6 to 53.0 degrees Fahrenheit (°F). The average wind speed is approximately 12 miles per hour. Average total precipitation at Cape Romanzof is 25.48 inches per year, with an average annual snowfall of 68.2 inches (Western Regional Climate Center 2015). Winter snowpack and winds often create severe conditions. The Bering Sea is ice-free from June to October (Wendler *et al* 2013).

### **2.5.3 Geology**

The Cape Romanzof Upper Camp consists of sand, gravel, and boulders overlying the granite bedrock of Towak Mountain. The Lower Camp is underlain by deposits of talus (coarse-grained materials) and other colluvial materials (USAF 2011). The U-shaped valley cross-section and the stepped longitudinal profile of Fowler (Nilumat) Creek are typical of glaciated valleys (USACE 2013). The Upper Camp is characterized by a thin accumulation of angular sand and residual erosional blocks overlying granitoid bedrock (USACE 2013).

The area is composed predominantly of Cretaceous intrusive rocks of felsic composition, classified as granitoids. The region is described as having been weathered and eroded by ice wedges, and underlain by partial or discontinuous permafrost (USACE 2013).

#### **2.5.4 Surface and Subsurface Hydrology**

**Surface Water:** Surface water drainage is accomplished chiefly by overland flow to Fowler (Nilumat) Creek. Numerous ponds exist for short periods of time (usually one to five days) following precipitation events. Kokechik Bay is a major surface water feature of the Yukon Delta NWR (USACE 2013). Standing surface water or seeps were observed at OB942 during the 2011 CSE Phase I/II site visit (USACE 2013).

**Groundwater:** Small amounts of groundwater are available on the valley slopes as local perched water. Well Number 1, located at Lower Camp, is the drinking water source at Cape Romanzof LRRS. During the spring and summer months, groundwater is pumped from the Lower Camp to local storage facilities for later use (USAF 2011). The static water level in this well was measured at 29 feet below grade (Feulner 1966), which suggests that local groundwater occurs under artesian (confined) pressure.

**Wetlands:** OB942 is located between two emergent wetlands. An emergent wetland is characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants (Federal Geographic Data Committee 2013).

#### **2.5.5 Ecology**

**Flora:** Vegetation at Cape Romanzof LRRS is characterized by low-growing plants able to withstand the extreme wind conditions that predominate over the area. Marshes, marigold, crowberries, low-growing shrubs, and a few hardy grass species are common vegetation types (USAF 2011).

**Fauna:** Tomcod, herring, Alaska blackfish, and Dolly Varden inhabit Fowler (Nilumat) Creek, while pink salmon spawn in the creek. Several beaver ponds have been constructed in the creek. Arctic fox, vole, and rock ptarmigan have been seen throughout the Lower Camp (USAF 2011). Many species of bird live in or migrate through the areas around the LRRS, including 12 species of duck, rough-legged hawks, and horned and tufted puffins and others.

### **2.5.6 Previous Site Characterization Activities**

This section describes previous investigations pertaining to OB942; related documentation is available in the Administrative Record file for the site (refer to Section 1.2):

- A CSE Phase I/II was conducted in 2011 in order to obtain information and evaluate the possible presence of munitions, munitions debris, explosives, and contaminated media at two potential MRAs (USACE 2013). The CSE Phase I/II stated that the open burn area contained burned .30 and .50 caliber rounds; therefore, it is a potential munitions site. Soil sample results for both lead and antimony were below the ADEC Method Two soil cleanup levels.
- A Feasibility Study (FS) prepared in 2015 evaluated potential response technologies to address MCs associated with small arms debris in soil at OB942 (USAF 2015b). The alternatives presented in the FS were screened based on site-specific effectiveness, implementability, and cost and ranged from LUCs to complete removal and offsite disposal. The No Action alternative was retained as a baseline against which the other alternatives could be compared. Each alternative was subjected to detailed analysis, based on the threshold and primary balancing criteria established under the NCP [40 CFR 300.430(e)] (USAF 2015b).
- A Proposed Plan was developed in 2016 to address the MCs associated with small arms debris in soil at OB942 (USAF 2016). The preferred remedy called for LUCs that would include dig restrictions and signage. ADEC approved the Proposed Plan on 10 March 2016. One comment was received during the public comment period.

### **2.5.7 Nature and Extent of Contamination**

OB942 is an open burn area. The primary COC at OB942 is MCs associated with small-caliber ammunition that appear to have been burned onsite. Analytical results for chemicals of potential concern (COPCs) indicated that lead associated with activities conducted at OB942 are present in surface soil; however, results for both lead and antimony were below the ADEC Method Two soil cleanup levels (400 mg/kg for lead and 41 mg/kg for antimony)

(Figure 2-1). Lead concentrations ranged from 7.3 mg/kg to 13 mg/kg and antimony results were undetected.

No evidence of historical use of explosives and no MEC were observed during the CSE Phase I/II; however, their presence cannot be ruled out. Only small arms debris was observed during the visual survey (USACE 2013). Shells were found within the apparent burn location, and knockout debris was found nearby. The condition of some of the debris and shells indicated that intact rounds had been burned and exploded from the heat, as they appeared to have been shredded or blown apart (USACE 2013). Subsurface anomalies were detected with a metal detector that could potentially indicate buried small arms munitions or MEC.

### ***Types of Contamination and the Affected Media***

The primary COC at OB942 at the Cape Romanzof LRRS is MCs associated with small-caliber ammunition. Small arms debris and uninvestigated subsurface anomalies remaining onsite also present a potential physical hazard. Analytical results indicate that there is lead in soil in concentrations that are below the soil cleanup level (400 mg/kg) within the 2011 investigation area.

No surface water, sediment, or groundwater data were collected during the CSE Phase I/II; these are considered potential exposure pathways. Depth to groundwater at the Lower Camp ranges from 1 foot to 60 feet below ground surface (bgs) (USAF 2011). Groundwater at LF003, which is upgradient of OB942, was found at 10 to 20 feet bgs. Groundwater is used as the drinking water source for the Cape Romanzof LRRS (USACE 2013).

### ***Known or Potential Routes of Migration***

Surface water flowing across OB942 provides a mechanism for potential contamination of the wetlands and Fowler (Nilumat) Creek by MCs. Surface water runoff would probably not carry off significant quantities of MCs. The potential also exists for humans to have dermal contact; however, there is no known contamination above the ADEC cleanup levels.



Terrestrial and surface water are present; therefore, contaminant uptake by terrestrial plants, including rain splash onto plants, is possible, as contamination is present in the root zone (0 to 4 feet bgs). Incidental ingestion/exposure or inhalation of dust by grubbing, foraging, or burrowing animals is also possible. While several mammalian species are present at Cape Romanzof LRRS, no endangered species or critical habitat areas are known to exist in the vicinity (USACE 2013).

### ***Conceptual Site Model***

Although OB942 does not have CERCLA-regulated contamination above cleanup criteria, a site-specific conceptual site model (CSM) was developed (Appendix B) to depict the potential relationship or exposure pathway between chemical sources and receptors under current conditions per ADEC guidance. No MEC or munitions debris were anticipated or found at OB942; however, their presence cannot be ruled out. Exposure pathway analysis for small arms debris, subsurface anomalies, and MCs (if present above acceptable levels) in soil to human and ecological receptors was addressed. Due to the physical hazards presented by potential MEC or munitions debris in subsurface soil, and the potential presence of higher concentrations of MCs in areas that have not been sampled, soil is considered an impacted medium. The groundwater, surface water, and sediment pathways are incomplete for human receptors. MCs were limited to lead and antimony from small arms activities, which are below the ADEC cleanup level (USACE 2013). The pathways for human health are presented in Table 2-2.

In the absence of surface water and sediment data, and the proximity to various surface water channels adjacent to OB942, the surface water, sediment, and groundwater pathways are potentially complete for ecological receptors. Biota may be affected as lead has the ability to bioaccumulate. Potential ecological receptors include invertebrates and seabirds. Marine mammals are not likely to be affected, as contaminants do not appear to be migrating from OB942. Lead levels exceed the EPA ecological soil screening levels (Eco-SSL) for birds (11 mg/kg) in two locations (USACE 2013).

These ecological receptors are potentially at risk from lead contamination; however, the area at OB942 with lead greater than or equal to the EPA Eco-SSL is extremely small when compared to the home range of the EPA's indicator species (birds) from which this screening level was derived. The pathways for ecological receptors are presented Table 2-3.

**Table 2-2  
Human Health Conceptual Site Model**

Current and Potential Future Contaminated Media	Release Mechanism	Potential Exposure Pathway	Potential Exposure Route	Human Receptors							
				Current				Future <sup>1</sup>			
				SUBSISTENCE CONSUMERS	SITE VISITORS	SITE WORKERS	RESIDENTS	SUBSISTENCE CONSUMERS	SITE VISITORS	SITE WORKERS	RESIDENTS
Surface Soil	Burning	Rain Splatter	Inhalation	—	—	—	N/A	—	—	—	—
			Ingestion	—	—	—	N/A	—	+	+	+
	Plant and Animal Uptake	Biota <sup>2</sup>	Ingestion	—	—	—	N/A	+	—	—	+

**Notes:**

<sup>1</sup> Residential use of OB942 is not anticipated; however, it is considered as a future scenario in order to determine whether the site will be eligible for UU/UE.

<sup>2</sup> If significant exposure occurs, lead concentrations may increase due to bioaccumulation.

N/A = not applicable

+ Complete exposure pathway

— Negligible effect or incomplete pathway

**Table 2-3  
Ecological Conceptual Site Model**

Current and Potential Future Contaminated Media	Release Mechanism	Potential Exposure Pathway	Potential Exposure Route	Ecological Receptors									
				Current					Future				
				VEGETATION	INVERTEBRATES	FISH	BIRDS	MAMMALS	VEGETATION	INVERTEBRATES	FISH	BIRDS	MAMMALS
Surface Soil	Burning	Rain Splatter, Burrowing	Inhalation	N/A	+	N/A	+	+	N/A	+	N/A	+	+
			Ingestion	N/A	+	N/A	+	+	N/A	+	N/A	+	+
			Direct Contact	+	+	N/A	+	+	+	+	N/A	+	+
	Plant and Animal Uptake	Biota <sup>1</sup>	Bioaccumulation	+	+	N/A	+	+	+	+	N/A	+	+

**Notes:**

<sup>1</sup> If significant exposure occurs, lead concentrations may increase in the body over time due to bioaccumulation.

N/A = not applicable

+ Complete exposure pathway

– Negligible effect or incomplete pathway

## **2.6 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES**

### **2.6.1 Land Use**

Current land use of the Cape Romanzof LRRS includes industrial activities associated with O&M of the radar installation and runway. Current use of nearby lands is minimal but includes some recreational use. No plans that will significantly change existing land use at Cape Romanzof LRRS are anticipated.

As lead agency, the USAF has the authority to determine the future land use of OB942. After considering input from the State of Alaska and the local community, the USAF has determined that land use at OB942 is expected to remain the same. LUCs established at OB942 by the selected remedy will protect human health under a recreational-use scenario but does not allow for unrestricted use of the site. LUCs will limit site activities through dig restrictions and signage, but will not change land use.

### **2.6.2 Groundwater and Surface Water Uses**

Groundwater is used as the drinking water source for the Cape Romanzof LRRS (USACE 2013). Water supply for the installation is obtained from groundwater in an area that is upgradient of and not affected by MCs. It is unknown to what extent installation personnel use the resources in Fowler (Nilumat) Creek, but with only a few contract personnel occupying the Cape Romanzof LRRS, use is likely infrequent. Fowler (Nilumat) Creek empties into Kokechik Bay, an important resource for subsistence gathering of shellfish and herring spawn. LUCs established at OB942 by the selected remedy will limit site activities through dig restrictions (including restrictions on drilling groundwater wells) and signage, but will not change groundwater or surface water use.

## **2.7 SUMMARY OF SITE RISKS**

The remedial action objective (RAO) for OB942 consists of site-specific goals for protecting human health and the environment. Implementation of the RAO, as described in Section 2.8, will minimize human and ecological exposure risks.

A screening level human health risk assessment (HHRA) and ecological risk assessment were conducted as part of the CSE Phase I/II investigation and were limited to the soil sample data collected in 2011. Lead and antimony were identified as COPCs. The exposure assumptions used to develop the HHRA included both current exposures to the Cape Romanzof LRRS staff, construction workers, and visitors, and potential future exposures to residents (USACE 2013).

### **2.7.1 Human Health Risks**

The primary COCs at OB942 are MCs associated with small arms debris. Based on the levels of lead found in soil at OB942, a response action is not necessary. However, a response action is necessary due to the physical hazards associated with the potential presence of buried MEC or munitions debris and the chemical hazards posed by any MC that might be present in areas that were not sampled.

#### ***Identification of Chemicals of Concern***

The only COCs at OB942 are MCs associated with small-caliber ammunition. Analytical results of COPCs (lead and antimony) indicated that there is lead in surface soil (0 to 12 inches bgs) associated with activities conducted at OB942 (USACE 2013). Soil samples detected lead ranging from 7.3 mg/kg to 13 mg/kg; all sample results were below the ADEC Method Two cleanup level of 400 mg/kg (ADEC 2016b). Antimony was not detected.

#### ***Toxicity Assessment***

Lead is highly toxic at very low levels, and is a probable human carcinogen although it is not typically evaluated for cancer risk. Lead targets the nervous system and may also cause weakness in fingers, wrists, or ankles. In children, lead can cause cognitive developmental effects. In adults, small increases in blood pressure and anemia may follow lead exposure, especially in middle-aged and older individuals. At high levels, lead can severely damage the brain and kidneys, cause decreases in sperm production in men or miscarriage in women, and ultimately result in death.

All soil sample results for lead from the CSE Phase I/II were well below the risk-based cleanup level of 400 mg/kg set by EPA and ADEC for a residential land use scenario (Table A-1 Chemical-Specific ARARs in Appendix A); therefore, no additional human health assessment for lead is necessary. Lead concentrations do exceed the EPA Eco-SSL benchmark of 11 mg/kg used for ecological receptors, and is therefore still considered a COPC at OB942 (Table A-1 Chemical-Specific ARARs, Appendix A).

### ***Human Exposure Assessment***

The human health CSM describes the potential relationship or exposure pathway for small arms debris, subsurface anomalies, and potential MC-contaminated soil at OB942 impacting both potential current and potential future human receptors. There is no known human health threat from any potential contaminant exposure pathways at OB942, as concentrations of lead and antimony are below risk-based cleanup levels (USACE 2013). If achieved, the RAO developed for OB942 (Section 2.8) will adequately mitigate future human health risks related to both known and potential physical and chemical hazards related to former site use. Under the preferred alternative, LUCs will be implemented and dig restrictions will be applied. CERCLA five-year reviews will be required.

At the Cape Romanzof LRRS, populations may be exposed to physical and/or chemical hazards during recreational land use or during site work; subsistence harvesting activities are limited due to the inaccessibility of OB942 and the distance from the nearest populated areas, Scammon Bay and Hooper Bay.

### ***Risk Characterization***

The risk-based cleanup levels listed under 18 AAC 75 are based upon a lifetime cancer risk threshold of  $1 \times 10^{-5}$  and a non-cancer hazard index of 1. Since concentrations of contamination are below risk-based levels at OB942, action is not required under CERCLA to protect human health and the environment from COPCs in soil. However, action is required to prevent potential contact with debris and potential MEC remaining onsite, as presented in the CSM (Appendix B).

The range of concentrations representative of lead in soil present at OB942 are shown in Table 2-4.

**Table 2-4**  
**Summary of Medium-Specific Primary Exposure Concentrations**

Exposure Point	COPC	Frequency of Detection	Range of Results (mg/kg)	Cleanup Level <sup>1</sup> (mg/kg)	Location
Soil – Direct Contact/Ingestion	Lead	7/7	7.3 to 13	400	Open Burn Area

**Notes:**

<sup>1</sup> Cleanup Levels based on 18 AAC 75.341(c) Method Two, Table B2 soil cleanup levels for the Under 40-Inch Zone, ingestion exposure pathway (ADEC 2016b).

Scenario Timeframe: Current

Media: soil

Exposure Media: soil, surface water, outdoor air

For definitions, refer to the Acronyms and Abbreviations section.

## 2.7.2 Ecological Risks

The ecological risk assessment conducted during the CSE Phase I/II investigation concluded that concentrations of lead in soils may result in unacceptable risks to ecological receptors at OB942 (USACE 2013). Two sample results exceeded the EPA Eco-SSL value for lead (11 mg/kg), and one sample result was equal to the EPA Eco-SSL value for lead. None of the concentrations of antimony exceeded the EPA Eco-SSL value for antimony (0.27 mg/kg). These screening values for lead and antimony are less than background values for many states; however, the levels indicate the contamination present is potentially harmful to terrestrial plants and animals (USACE 2013).

Lead present in surface soils has the potential to bioaccumulate and to be taken up into biota through the root zone for plants or by burrowing animals. Complete pathways include direct contact with or uptake of surface soil; incidental ingestion of surface or subsurface soil; and direct contact, absorption, or ingestion of groundwater. The assessment applies in particular to invertebrates and ground-feeding birds that are prevalent at OB942. However, the area at OB942 with lead greater than or equal to the EPA Eco-SSL is extremely small when compared to the home range of the EPA's indicator species (birds) from which this screening level was derived.



### **2.7.3 Basis for Action**

The response action selected in this ROD is necessary to protect the 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.

## **2.8 REMEDIAL ACTION OBJECTIVES**

The RAO for OB942 is intended to protect human health and the environment from unacceptable exposure to contamination in soil and groundwater, as well as to prevent potential contact with debris remaining onsite (USAF 2015b). The following RAO was identified for OB942:

- Minimize or eliminate the potential for human exposure to MEC, which could present a physical hazard.

Achievement of this RAO is necessary to be protective of human health while allowing continued site use for the USAF mission at the Cape Romanzof LRRS and protecting the sensitive tundra environment from disruption.

## **2.9 DESCRIPTION OF ALTERNATIVES**

Remedial alternatives for MCs at OB942 have been developed. The alternatives were developed based on the RAO and general response actions identified for OB942 and on the screening of potential remedial technologies. To develop a response strategy for MCs at OB942, a conceptual understanding of the volume and location of the MCs is needed. Approximately 3 cubic yards (cy) of MCs and approximately 400 cy of MCs mixed with soil in surface soil (0 to 3 inches bgs) are present at OB942 (USAF 2015b).

The following alternatives were evaluated for remediation of MCs at OB942:

- Alternative 1: No Action
- Alternative 2: LUCs

- Alternative 3: Capping, LUCs, and Long-Term Monitoring (LTM)
- Alternative 4: Removal and Offsite Disposal

In accordance with CERCLA guidance, the No Action alternative was retained for comparison. The feasibility of other alternatives initially considered was generally limited by the remoteness of the site location and sensitivity of the tundra environment. The FS conducted for OB942 defined these alternatives and selected Alternative 2 as the preferred alternative; Alternative 2 is protective of human health and the environment and complies with the ARARs applicable to OB942. ARARs are discussed in Section 2.10.2, and a complete list is provided in Appendix A. Table 2-5 presents the listed alternatives and the associated advantages and disadvantages of each.

**Table 2-5  
Summary of Remedial Alternatives Evaluated for OB942**

Alternative	Description	Key Assumptions	Advantages	Disadvantages	Cost Estimate <sup>1</sup> (millions)
Alternative 1	No Action	<ul style="list-style-type: none"> <li>No action is planned.</li> </ul>	<ul style="list-style-type: none"> <li>Easy to Implement</li> <li>No cost</li> <li>No CERCLA five-year reviews</li> </ul>	<ul style="list-style-type: none"> <li>Not protective</li> <li>Does not comply with ARARs</li> </ul>	\$0
Alternative 2 (selected remedy)	LUCs	<ul style="list-style-type: none"> <li>LUCs will be effective in preventing exposure to small arms debris, subsurface anomalies, and any existing MCs.</li> <li>LUC inspections and reports will be scheduled at least once every five years.</li> </ul>	<ul style="list-style-type: none"> <li>Easy to implement</li> <li>Low cost</li> </ul>	<ul style="list-style-type: none"> <li>Small arms debris and uninvestigated subsurface anomalies will remain onsite indefinitely.</li> <li>CERCLA five-year reviews will be required to ensure that the site remedy remains protective.</li> </ul>	\$0.43
Alternative 3	Capping, LUCs, and LTM	<ul style="list-style-type: none"> <li>Containment will be successful; no MCs will migrate beyond site boundaries.</li> <li>LUCs will be effective in preventing exposure to small arms debris, subsurface anomalies, and any MCs.</li> <li>LTM inspections will occur once a year for the first five years, and once every five years thereafter for an indefinite period of time.</li> <li>The LTM inspections will be sufficient to protect human health and the environment.</li> </ul>	<ul style="list-style-type: none"> <li>Minimizes exposure potential to physical and potential chemical hazards</li> </ul>	<ul style="list-style-type: none"> <li>Small arms debris and uninvestigated subsurface anomalies will remain onsite indefinitely.</li> <li>CERCLA five-year reviews will be required to ensure that the site remedy remains protective.</li> </ul>	\$1.17
Alternative 4	Removal and Offsite Disposal	<ul style="list-style-type: none"> <li>Volume estimates are accurate.</li> <li>No explosive hazards are present.</li> </ul>	<ul style="list-style-type: none"> <li>Highly effective</li> <li>All potential hazards will be removed</li> <li>No LUCs or CERCLA five-year reviews</li> <li>OB942 would be available for UU/UE</li> </ul>	<ul style="list-style-type: none"> <li>Difficult to implement because it requires that large amounts of soil be shipped offsite for disposal</li> <li>Disruptive to the environment</li> <li>Does not satisfy the CERCLA statutory preference for the treatment of contamination</li> </ul>	\$1.73

**Notes:**

<sup>1</sup> Costs are estimated with +50/-30% accuracy based on subcontractor quotes, construction drawings, and engineering estimates  
For definitions, refer to the Acronyms and Abbreviations section.

### 2.9.1 Description of Remedy Components

As listed in Section 2.9, four alternatives were developed to address potential hazards at OB942. This section provides a summary overview of the components of those alternatives.

#### *Alternative 1: No Action*

- No response action would be taken. The No Action Alternative does not include provisions for environmental monitoring, controlling the migration of contaminants, reducing contaminant concentrations, or preventing human or ecological exposure.
- This alternative is a baseline for comparison as required under the NCP, 40 CFR 300.430(e)(6).
- There is no cost associated with Alternative 1. However, exposure risks to human health and the environment would persist. Regulatory concurrence with the selection of this alternative is unlikely.
- This alternative fails to comply with chemical-specific ARARs.

#### *Alternative 2: LUCs (Preferred Alternative)*

- No MCs or debris would be removed.
- LUCs would be implemented to restrict land use and prevent the removal and transportation of MCs and debris. Signage would be installed to prevent unauthorized access. The USAF dig permitting system would be utilized. No unauthorized transport or disposal of soil or unauthorized digging/excavation would occur without ADEC notification and approval. The LUCs at OB942 would be incorporated into the USAF LUC Management Plan.
- CERCLA five-year reviews would be required to evaluate the long-term protectiveness of the remedy.
- The approximate cost for this alternative is \$0.43 million; the estimated project duration would be 0 days.
- This alternative would comply with all chemical-, location-, and action-specific ARARs, including RCRA, the Alaska *Oil and Other Hazardous Substances Pollution Control* regulations (18 AAC 75), the Clean Water Act (33 USC 1251 et seq; Section 404: 33 USC 1344; 40 CFR 230), and the Migratory Bird Treaty Act (16 USC 703-712; 50 CFR Parts 10, 20, 21).

### ***Alternative 3: Capping, LUCs and LTM***

- No MCs or debris would be removed.
- MCs and debris at OB942 would be capped with a minimum 2-foot soil cap. The cap would be used to prevent direct contact with MCs, minimize infiltration and resulting leaching, and control surface water runoff and erosion. Regularly scheduled inspections and maintenance would be performed to ensure cap integrity.
- LUCs would be used to restrict land use and to prevent the removal and transportation of MCs and debris. Signage would be installed to prevent unauthorized access and maintain the integrity of the cap. The USAF dig permitting system would be utilized to avoid activities that could breach the cap. No unauthorized transport or disposal of soil, or unauthorized digging/excavation would occur without ADEC notification and approval. The LUCs at OB942 would be incorporated into the USAF LUC Management Plan.
- The approximate cost for this alternative is \$1.17 million; the estimated project duration would be 32 days.
- Periodic maintenance, monitoring, reviews, and CERCLA five-year reviews would be required under this alternative, as MCs would remain at OB942.
- This alternative would comply with all chemical-, location-, and action-specific ARARs, including the *Alaska Oil and Other Hazardous Substances Pollution Control* regulations (18 AAC 75), *Alaska Air Quality Control* regulations (18 AAC 50, 15), *Alaska Solid Waste Management* regulations (18 AAC 60), the Clean Water Act (33 USC 1251 et seq; Section 404: 33 USC 1344; 40 CFR 230), the Clean Air Act (40 CFR 50-97), and the Migratory Bird Treaty Act (16 USC 703-712; 50 CFR Parts 10, 20, 21).

### ***Alternative 4: Removal and Offsite Disposal***

- An unexploded ordnance inspection would take place prior to collecting and moving any debris; however, it is assumed that that all debris is inert.
- MCs, debris, and soil would be excavated, staged, manifested, and transported for disposal to a treatment, storage, and disposal facility (TSDF) waste landfill. It is estimated that approximately 3 cy of debris are present at OB942. When mixed with the top 3 inches of soil, the volume is estimated at 400 cy (approximately 600 tons); when excavated, the amount of debris and soil to be disposed of equates to approximately 480 cy (approximately 720 tons) when adjusting for bulk factor.
- Five waste characterization samples would be collected from the staged soil for waste profiling.
- It is anticipated that excavation activities would focus on the top 3 inches of surface soil and would include all MCs, debris, and associated soil. OB942 would be backfilled with locally available clean fill.
- MCs, debris, and soil would be excavated and loaded into 1-cy Super Sacks, each holding approximately 0.5 tons.

- Approximately 96 trips between the OB942 and the barge landing would be made to transfer MCs, debris, and soil (720 tons, 7.5 tons per outgoing trip).
- Super Sacks staged at the barge landing would be placed on a barge for transport to Anchorage and would include two barge trips for all waste. Containers would then be transported from Anchorage to the TSDF in the contiguous United States.
- At the conclusion of site work, OB942 would be available for UU/UE. No periodic or CERCLA five-year reviews would be required.
- The approximate cost for this alternative is \$1.73 million; the estimated project duration would be 24 days. However, the cost and amount are likely to vary because the weather patterns have the potential to affect project duration.
- This alternative could be implemented in a manner that complies with all chemical-, location-, and action-specific ARARs, including RCRA, the Alaska *Oil and Other Hazardous Substances Pollution Control* regulations (18 AAC 75), Alaska *Air Quality Control* regulations (18 AAC 50, 15), *Alaska Solid Waste Management* regulations (18 AAC 60), Alaska *Hazardous Waste* regulations (18 AAC 62), the Clean Water Act (33 USC 1251 et seq; Section 404: 33 USC 1344; 40 CFR 230), the Clean Air Act (40 CFR 50-97), the Migratory Bird Treaty Act (16 USC 703-712; 50 CFR Parts 10, 20, 21), and U.S. Department of Transportation Regulations.

## 2.10 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In accordance with the NCP, the remedial alternatives were evaluated against the nine criteria described in CERCLA §121(b) and the NCP 300.430(e)(9)(iii), which are described below. These alternatives were evaluated using site-specific information and sampling data, as well as professional and scientific judgment, and compiled in the FS (USAF 2015b). This section of the ROD profiles the relative performance of each alternative against the nine criteria, which fall into three groups: threshold, primary balancing, and modifying criteria, and note how each alternative compares to the other options under consideration.

**Threshold criteria** are standards that an alternative must meet to be eligible for selection as a remedial action. There is little flexibility in meeting the threshold criteria—the alternative must meet them or it is unacceptable. Two of the nine criteria are considered threshold criteria:

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

**Balancing criteria** weigh the tradeoffs between alternatives. These criteria represent the standards upon which detailed evaluation and comparative analysis of alternatives are based. In general, a high rating on one criterion can offset a low rating on another. Five of the nine criteria are considered balancing criteria:

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

**Modifying criteria** indicate whether technical and administrative issues have been met by the alternative and address the public concerns in the decision-making process. Two of the nine criteria are considered modifying criteria:

- Community acceptance
- State/support agency acceptance

Table 2-6 and the following sections summarize how well each alternative satisfies the evaluation criteria and provides a basis for comparison to the other alternatives under consideration.

**Table 2-6  
Screening of Alternatives for OB942**

Alternative	Threshold Criteria		Primary Balancing Criteria					Modifying Criteria	
	Overall Protection of Human Health and the Environment	Compliance with ARARs	Long-Term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume through Treatment	Short-Term Effectiveness	Implementability	Cost (millions)	State Acceptance	Community Acceptance
Alternative 1: No Action	○	○	0	0	0	5	\$0	No	No
Alternative 2: LUCs	●	●	2	0	3	4	\$0.43	Yes	Yes
Alternative 3: Capping, LUCs, and LTM	●	●	3	0	3	3	\$1.17	Yes	Yes
Alternative 4: Removal and Offsite Disposal	●	●	5	0	2	3	\$1.73	Yes	Yes

**Notes:**

● or 5 = Fully meets criterion

◐ or 1 to 4 = Somewhat meets criterion

○ or 0 = Does not meet criterion

For definitions, refer to the Acronyms and Abbreviations section.



### **2.10.1 Overall Protection of Human Health and the Environment**

Overall protection of human health and the environment addresses whether each alternative provides adequate protection and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, and/or LUCs. All of the alternatives, except the No Action alternatives, are protective of human health and the environment by eliminating, reducing, or controlling risks posed by contamination at OB942. The No Action alternative does not include provisions for environmental monitoring, controlling the migration of contaminants, reducing contaminant concentrations, or preventing human or ecological exposure. Alternatives 2 through 4 would be effective.

### **2.10.2 Compliance with Applicable or Relevant and Appropriate Requirements**

CERCLA §121(d) and NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites satisfy ARARs unless waived under CERCLA §121(d)(4).

ARARs are divided into three categories. Chemical-specific ARARs were used to set cleanup levels that are both protective of human health and ecological receptors (18 AAC 75) during site work. Location-specific ARARs require that potential wildlife habitat, migration patterns, and negative effects on the ecosystem be considered as part of project design. Action-specific ARARs are included to highlight proper waste management procedures and provide pollution control and notification procedures in the event of a spill. ARARs, once identified, are then further classified as applicable, relevant, and appropriate, or to be considered. The ARARs for OB942 are presented in Appendix A.

**Applicable requirements** are cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal or state environmental regulations or facility-citing laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. State standards may be applicable provided they are at least as stringent as federal requirements and are identified in a timely manner.

**Relevant and appropriate** requirements are cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal or state environmental regulations or facility-citing laws that, while not “applicable” to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site (relevant) that their use is well-suited (appropriate) to the particular site. State standards may only be relevant and appropriate if they are identified in a timely manner and are more stringent than federal requirements.

Compliance with ARARs addresses whether a remedy will meet all federal and state environmental regulations, or provides a basis for invoking a waiver. No waiver for OB942 is anticipated to be necessary; Alternatives 2, 3, and 4 meet the provisions of the ARARs as shown in Appendix A, so long as they are implemented as designed (Alternatives 2 and 3) and all waste streams are handled, manifested, transported, and disposed of in accordance with applicable federal and state regulations including, but not limited to the Resource Conservation and Recovery Act (RCRA) and 18 AAC 75 (Alternative 4).

The No Action alternative would result in contaminated soil remaining onsite in an uncontrolled manner. This would not be protective of human health or the environment and would not comply with ARARs.

### **2.10.3 Long-Term Effectiveness and Permanence**

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time after the selected alternative has been implemented. This criterion includes the consideration of residual risk that will remain onsite and the adequacy and reliability of controls.

Alternatives 2 and 3 rely on the adequate implementation of LUCs to remain effective over the long-term, but would do very little damage to the environment. Alternative 3 relies on the adequate implementation and regular maintenance of the cap to remain effective over the

long-term. Alternative 4, once executed, would render OB942 immediately available for UU/UE, but must be weighed against the negative implications of disrupting the environment at OB942, which would also be long-term.

#### **2.10.4 Reduction of Toxicity, Mobility, or Volume through Treatment**

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy. Under CERCLA, there is a preference for alternatives that reduce the toxicity, mobility, and/or volume of contaminated media through treatment.

For OB942, none of the alternatives meet the statutory preference for treatment. The goal of the alternatives would be to prevent exposure to, rather than treat, MCs and debris.

#### **2.10.5 Short-Term Effectiveness**

Short-term effectiveness addresses the period of time needed to implement the alternative and any potential adverse impacts on workers, the community, and the environment during construction and operation of the alternative.

Under the No Action alternative, no efforts to protect potential human and ecological receptors would take place. Therefore, the No Action alternative does not provide short-term effectiveness. Under Alternative 2, LUCs would provide moderate short-term effectiveness by eliminating exposure to potential hazards, which would remain on the site indefinitely. Because of surface debris, there is a possibility of short-term exposure risk to workers associated with construction of the cap as part of Alternative 3. Short-term risks associated with cap maintenance may also present an exposure concern for future site workers. An increased volume of fossil fuels will be needed and released into the environment as a result of both the heavy machinery to construct the cap and the airplane/vehicles for transportation offsite. Alternative 4 poses greater risk of exposure or potential release through the long and complex transportation chain from the Cape Romanzof LRRS to an appropriately permitted TSDF in the contiguous United States. Removal of potential hazards would be highly

effective in a short timeframe. Because much of OB942 has previously been developed, anticipated impacts are not considered significant. The estimated 96 round trips between the Lower Camp and the airstrip required to implement this alternative pose a moderate-high risk to workers due to dangers associated with the road condition between the Lower Camp and the airstrip at the Cape Romanzof LRRS. Exposure risks associated with MCs, debris, and soil removal and containerization, and hazards associated with heavy equipment would create additional threats to site workers. These hazards would be addressed by instituting U.S. Occupational Safety and Health Administration/Hazardous Waste Operations and Emergency Response requirements (USAF 2015b).

#### **2.10.6 Implementability**

Implementability addresses the technical and administrative feasibility of the 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.

The No Action alternative is technically very easy to implement, but administrative approval is unlikely because it is not protective of human health and the environment and does not comply with ARARs or achieve the RAO.

The remote location of the Cape Romanzof LRRS raises the importance of this criterion. Alternatives 3 and 4 would require the mobilization of heavy equipment and personnel to OB942. Alternative 4 would require long-distance barge transportation of debris and soil to an appropriately licensed disposal facility, which creates the potential for improper handling and spills; this risk is not present under Alternative 2. Alternative 2 is likely to achieve the modifying criteria (state and community acceptance) because it does not require any heavy equipment, but is still protective of human health and the environment (USAF 2015b).

Because OB942 is between two wetlands and Alternatives 3 and 4 have the potential to include dredging and filling of wetlands, coordination with USACE will need to be conducted

along with potentially utilizing a nationwide permit. Best management practices, such as silt fences and polyethylene plastic sheeting, should also be utilized to limit damage to surrounding wetlands.

#### **2.10.7 Relative Cost**

Due to the remoteness of the Cape Romanzof LRRS, the primary cost factor for any remedial action is the quantity of material that needs to be capped or the waste that needs to be transported. Alternative 2 has the lowest cost, but does not significantly lower the risk. Cost estimates for Alternative 3 are based on the assumption that 517 cy (775.5 tons) of soil would be required to cap the MCs and debris with a 5,625 square foot cover and the maintenance of LUCs at OB942. Alternative 4 has the highest cost but is difficult to implement, including heavy equipment operation and containerization, shipment, and disposal of affected soil and debris (USAF 2015b).

The estimated costs for each alternative are presented in Table 2-7. These estimates include labor, equipment, waste transport and disposal, laboratory analysis, sampling, re-seeding, and five-year monitoring where applicable for a period of 30 years.

**Table 2-7  
OB942 Alternatives Cost Summary**

<b>Alternative</b>	<b>Capital<sup>1</sup> (millions)</b>	<b>Present Worth Operation &amp; Maintenance<sup>2</sup> (millions)</b>	<b>Total Present Worth Cost<sup>3</sup> (millions)</b>
Alternative 1: No Action	\$0	\$0	\$0
Alternative 2: LUCs	\$0.35	\$0.08	\$0.43
Alternative 3: Capping, LUCs, and LTM	\$0.89	\$0.28	\$1.17
Alternative 4: Removal and Offsite Disposal	\$1.73	\$0	\$1.73

**Notes:**

<sup>1</sup> The costs for five-year reviews conducted every five years for 30 years are incorporated into the capital cost for Alternatives 2 and 3. Five-year review costs were estimated at \$62,139.

<sup>2</sup> The costs for five-year reviews are included under Capital Costs. O&M costs include tasks such as site inspections (Alternatives 2 and 3), cap inspections, and cap maintenance (Alternative 3) using 5% rate of return over 30 years.

<sup>3</sup> Costs estimated with +50% / -30% accuracy based on subcontractor quotes, construction drawings, and engineering estimates. Values include total capital costs, total annual costs, and present worth of annual costs (5 percent rate of return). For definitions, refer to the Acronyms and Abbreviations section.

### **2.10.8 State/Support Agency and Land Manager Acceptance**

The No Action alternative is not viable because it is not protective of human health and the environment, nor does it comply with the ARARs.

Administrative concurrence for Alternatives 2, 3, and 4 is possible because the land is owned and operated by USAF; no plans exist to transfer the land, and land use is unlikely to change. Under Alternative 4, OB942 would be restored for UU/UE. CERCLA five-year reviews would not be required. ADEC concurs that, if implemented correctly, Alternatives 2, 3, and 4 are protective of human health, safety, and welfare; and the environment; and would therefore be eligible for approval. Alternative 2 was selected as the preferred alternative because it satisfies this criterion while more fully satisfying the cost and implementability.

### **2.10.9 Community Acceptance**

One comment was received from a government agency (U.S. Fish and Wildlife Service [USFWS]), but no comments were received from any of the local communities on the

Proposed Plan (USAF 2016). A summary of the public comment process, the written comment, and the response is provided in Part 3. Based on the lack of local response, it is assumed that the community accepts the selection of Alternative 2 for OB942 as presented in the 2016 Proposed Plan (USAF 2016).

## **2.11 PRINCIPAL THREAT WASTES**

No principal threat wastes have been identified at OB942. The principal threat concept refers to the source materials at a CERCLA site, which are considered highly toxic or highly mobile, that generally cannot be reliably controlled in place, or that present a significant risk to human health or the environment should exposure occur. A source material contains hazardous substances, pollutants, or contaminants (typically with a potential cancer risk of  $10^{-3}$  or greater [EPA Fact Sheet 9380.3]) that act as a reservoir for migration of contamination to groundwater or air, or that act as a source for direct exposure (EPA 1991). No principal threat wastes have been identified at OB942.

## **2.12 SELECTED REMEDY**

The remedy selected in this ROD is Alternative 2 LUCs. This remedy satisfies overall protectiveness and complies with ARAR criteria, and was the most favorable alternative with respect to implementability and cost. The selected remedy meets the RAO for OB942 as presented in Section 2.8 of this ROD.

The primary indicator of remedial action performance will be satisfying the RAO for OB942 (refer to Section 2.8) and protecting human health and the environment. Performance measures are defined herein as the required actions to achieve the RAO. It is anticipated that successful implementation, operation, maintenance, and completion of the performance measures will achieve a protective and legally compliant remedy for OB942.

### **2.12.1 Remedy Implementation**

The selected remedy under Alternative 2, LUCs, is designed to minimize or eliminate the potential for human exposure to small arms debris, MCs, and subsurface anomalies that may include MEC or munitions debris. The major components of the LUCs are described in Section 1.4. These remedy components will be implemented at OB942 and will require CERCLA five-year reviews.

### **2.12.2 Summary of the Rationale for the Selected Remedy**

The selected remedy presented herein is to leave MCs and debris in place but put signage and dig restrictions on the premises. The LUCs will mitigate the potential for human exposure, remain protective of human health and the environment, and satisfy the RAO for OB942. This alternative passes threshold criteria, is protective of human health and the environment over the long-term, and is more implementable and less costly than capping or removal and offsite disposal.

### **2.12.3 Description of the Selected Remedy**

As lead agency, the Air Force is responsible for implementing and enforcing the remedy selected herein for OB942. The AFCEC/Operations Division (CZOP) remedial project manager is the point of contact.

The land use at Cape Romanzof LRRS is designated as industrial use only currently and in the future. However, to assess the need for LUCs, the physical hazards presented by potential MEC and/or munitions debris in the subsurface were assessed for UU/UE, particularly under recreational and residential use scenarios. Due to the presence of buried anomalies that represent a potential physical hazard, OB942 was found to be unsafe for recreational or residential use, and any excavation would require unexploded ordnance (UXO) support. LUCs are therefore necessary to preclude such uses and to control the disposition and use of any soil excavated from the site, as MCs may be present in uninvestigated areas. LUCs will be implemented to restrict invasive and residential activities and protect human health from



exposure to potential buried MEC. The LUCs will be implemented to encompass OB942's 0.98-acre area (Figure 2-1).

The selected remedy (LUCs) includes the following components:

- The Air Force shall maintain the LUCs indefinitely, as buried anomalies would remain in place and OB942 would not be restored for UU/UE.
- The Air Force shall include signage around OB942 to prevent unauthorized access. The signage will be implemented and maintained by 611th Civil Engineer Squadron (611 CES).
- The Air Force will utilize the base dig permit system, which will prevent activities that could disturb the buried anomalies. The base dig permit system is implemented by 611 CES.
- The Air Force will utilize the base construction review process, which will prevent ground-disturbing construction activities. The base construction review process is implemented by 611 CES.
- The Air Force shall file a notice with the USAF real property office and in DNR land records that describes the nature and location of the pollutants or contaminants and the types and locations of LUCs.
- The Air Force shall add OB942 to the LUC management plan for Pacific Air Forces Regional Support Center installations.
- The Air Force is responsible for implementing, maintaining, monitoring, reporting, and enforcing LUCs.
- The Air Force shall inform, monitor, enforce, and bind, where appropriate, authorized lessees, tenants, contractors, and other authorized occupants of Cape Romanzof LRRS regarding the LUCs affecting OB942.
- Although the Air Force may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Air Force shall retain ultimate responsibility for remedy implementation and protectiveness.
- The Air Force will notify ADEC as soon as practicable, but no longer than ten days after discovery, of any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs. The Air Force will take prompt measures to correct the violation or deficiency and prevent its recurrence. In this notification, the Air Force will identify any corrective measures it has taken or any corrective measures it plans to take and the estimated time frame for completing them. For corrective measures taken after the notification, the Air Force shall notify ADEC when the measures are complete.

- The Air Force must provide notice to ADEC at least six months prior to any transfer or sale of property containing LUCs so that ADEC can be involved in discussions to ensure that appropriate provisions are included in the transfer or conveyance documents to maintain effective LUCs. If it is not possible for the facility to notify ADEC at least six months prior to any transfer or sale, then the facility will notify the state as soon as possible but no later than 60 days prior to the transfer or sale of any property subject to LUCs. The Air Force agrees to provide ADEC with such notice, within the same time frames, for federal-to-federal transfer of property accountability. The Air Force shall provide either access to or a copy of the executed deed or transfer assembly to ADEC.
- The Air Force shall not modify or terminate LUCs, modify land uses that might impact the effectiveness of the LUCs, take any anticipated action that might disrupt the effectiveness of the LUCs, or take any action that might alter or negate the need for LUCs without 45 days prior to the change seeking and obtaining approval from ADEC of any required ROD modification.
- The Air Force will monitor and inspect all site areas subject to LUCs no less often than once every five years as MCs associated with small arms debris and buried anomalies will remain onsite indefinitely. CERCLA five-year reviews will also be required.
- The Air Force will report no less often than once every five years to ADEC on the frequency, scope, and nature of LUC monitoring activities, the results of such monitoring, any changes to the LUCs, and any corrective measures resulting from monitoring during the time period.

The effectiveness of this remedy is dependent upon adequate implementation.

#### **2.12.4 Summary of Estimated Remedy Costs**

The information in the cost estimate summary is based on the best available information regarding the anticipated scope of the remedial alternative. Major changes to the estimated costs are not anticipated. If changes to the estimated costs occur, they will be documented in a technical memorandum, an Explanation of Significant Differences document, and/or a ROD amendment made available in the Administrative Record (refer to Section 1.2). Table 2-8 presents an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

**Table 2-8**  
**Capital and O&M Cost Estimates for the Selected Remedy**

Remedy	Description	Cost
LUCs	Capital cost	\$345,626
	Estimated present worth annual overhead and maintenance	\$83,809
	Estimated present worth costs	\$429,435

**Notes:**

Costs estimated with +50% / -30% accuracy based on subcontractor quotes, construction drawings, and engineering estimates. Cost estimates for the alternative are based on site-specific conceptual designs and are expressed in 2014 dollars. Time to achieve the RAO – 0 Days  
For definitions, refer to the Acronyms and Abbreviations section.

### 2.12.5 Expected Outcomes of the Selected Remedy

Under this alternative, OB942 would not be restored for UU/UE, as MCs and debris would remain in place. CERCLA five-year reviews would therefore be required with this remedy. The cleanup levels for OB942, ADEC Method Two criteria, are protective for residential use and have been met at OB942. Land use at OB942 is not anticipated to change and will remain restricted.

## 2.13 STATUTORY DETERMINATIONS

Under CERCLA §121 as required by NCP §300.430(f)(5)(ii), the lead agency must select a remedy that is protective of human health and the environment, complies with ARARs, is cost-effective, and uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes (1) a statutory preference for remedies that employ a treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal element; and (2) a bias against offsite disposal of untreated wastes.

The selected remedy for OB942 does not comply with the statutory preference for treatment as a principal element. No reduction of toxicity, mobility, or volume of waste through treatment will occur under Alternative 2.

### **2.13.1 Protection of Human Health and the Environment**

The selected remedy, Alternative 2, will protect human health by issuing dig restrictions and placing signage at OB942. The RAO will be achieved through LUCs.

### **2.13.2 Compliance with Applicable or Relevant and Appropriate Requirements**

Remedial actions must comply with both the federal and state ARARs presented and described in Appendix A. The selected remedy, Alternative 2, complies with the chemical-specific, location-specific, and action-specific ARARs, including RCRA (42 USC 6901), the *Alaska Oil and Other Hazardous Substances Pollution Control* regulations (18 AAC 75), the Clean Water Act (33 USC 1251 et seq; Section 404: 33 USC 1344; 40 CFR 230), and the Migratory Bird Treaty Act (16 USC 703-712; 50 CFR Parts 10, 20, 21). No waivers are required for OB942.

### **2.13.3 Cost Effectiveness**

In the USAF's judgment, the selected remedy is cost-effective and represents a reasonable value for the money that is to be spent. In making this determination, the following definition from 40 CFR 300.430(f)(1)(ii)(D) was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." This determination was accomplished by evaluating the "overall effectiveness" of those alternatives that satisfy the threshold criteria, meaning that they are protective of human health and the environment and compliant with the ARARs identified for OB942. The overall effectiveness of the selected remedy for OB942 was demonstrated in the comparative analysis of alternatives (Section 2.10) and is summarized in Table 2-9. The estimated present worth cost of the selected remedy is \$429,435 (in 2014 U.S. dollars). This cost includes provisions for signage and dig restrictions and five-year reviews.

### **2.13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies**

The selected remedy, Alternative 2, provides an effective long-term solution in consideration of the type of hazard present onsite and the remote location of the Cape Romanzof LRRS. LUCs – if implemented as intended – presents an overall site remedy that protects human

health, is readily implementable, and provides cost effectiveness in comparison to other alternatives.

### 2.13.5 Preference for Treatment as a Principal Element

The NCP establishes the expectation that treatment will be used to address the principal threats posed by a site wherever practicable based on 40 CFR 300.430(a)(1)(iii)(A). The selected remedy for OB942 does not satisfy the statutory preference for treatment of all waste streams as a principal element of remediation. MCs and debris will remain at OB942.

**Table 2-9  
Cost and Effectiveness Summary**

Remedy	Present Worth Cost (millions)	Long-Term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume Through Treatment	Short-Term Effectiveness
LUCs	\$0.43	Long-term risk to human health and the environment would be reduced through restricting the site use by implementing dig restrictions and posting signage.	No reduction in toxicity, mobility, or volume through treatment will occur under this alternative.	During site work, there would be no exposure as no personnel are entering the area.

**Note:**

For definitions, refer to the Acronyms and Abbreviations section.

### 2.13.6 Five-Year Review Requirements

Since the selected remedy will result in pollutants or contaminants remaining at OB942 that do not allow for UU/UE, a statutory review must be conducted within five years of the initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment. The five-year review will include an evaluation of remedy effectiveness, the appropriateness of new technologies, changes in ARARs, recommendations to implement remedial contingencies, and will be consistent with EPA five-year review guidelines per CERCLA §121(c) and NCP §300.430(f)(4)(ii).

## **2.14 DOCUMENTATION OF SIGNIFICANT CHANGES**

The Proposed Plan for OB942 (USAF 2016) was released for public comment in March 2016. The Proposed Plan identified LUCs as the proposed remedial action. One written comment was submitted during the public comment period. It was determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

### **PART 3:      RESPONSIVENESS SUMMARY**

This section provides a summary of the public comments regarding the *Proposed Plan for OB942 Open Burn Area, Cape Romanzof LRRS, Alaska* (USAF 2016). At the time of the public review period, USAF proposed Alternative 2: LUCs to address potential hazards at OB942.

The state regulatory agency, ADEC, was invited to comment on the draft of the Proposed Plan prior to the public comment period. All regulator comments on the Proposed Plan were addressed and integrated into the final version. All regulator comments on this draft ROD will also be addressed and integrated into the final version.

NCP 300.430(f)(3) establishes a number of public participation activities that the lead agency must conduct as part of the CERCLA process; these are discussed in detail in Section 2.3. The Proposed Plan (USAF 2016) was made available to the public for public review during a 30-day public comment period that began on 11 March 2016 and lasted through 11 April 2016. A notice regarding the availability of the Proposed Plan was published in the *Delta Discovery* on 16 and 23 March 2016. Copies of the Proposed Plan were distributed for public review and comment to several local agencies in Scammon Bay, Hooper Bay, and Chevak, Alaska. One comment was received during the public comment period. A public meeting was not requested by the community to discuss the Proposed Plan for OB942.

#### **3.1 ORAL AND WRITTEN COMMENTS AND RESPONSES**

The only comment provided following the public comment period was from USFWS. It is quoted in its entirety below. The lead agency and responsible party (USAF) noted that the comment had been received.

*I do not have any formal comments on the Proposed Plan since this site potentially poses more of a physical human health risk than anything, and the site is currently on Air Force property. The only comment I would make is that DoD agencies have made a pretty big push recently to downsize the property for which they are responsible in order to reduce their liability. Assuming that sometime in the future the Air Force would like to incorporate portions of the property into the Yukon Delta NWR, please*

*note the USFWS will not accept the responsibilities associated with properties with land-use or institutional controls. Therefore, the USFWS would suggest the Air Force address the hazards related to the munitions and remove contaminated material at the site in order to eliminate all human and environmental risk.*

### **3.2 TECHNICAL / LEGAL ISSUES**

Additional analytes, including diesel-range organics, gasoline-range organics, benzene, toluene, ethylbenzene, and xylenes were sampled as part of a separate ERP site investigation, which was underway at the time this ROD was prepared. If these analytes are detected in concentrations that exceed ADEC cleanup levels, they will be addressed under the ERP in accordance with State of Alaska regulations and guidance. A separate decision document will be prepared for any additional analytes that are identified as part of ERP sampling planned for the future.



## PART 4: REFERENCES

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**APPENDIX A**  
**Applicable or Relevant and Appropriate Requirements**

## **APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS OB942 CAPE ROMANZOF LRRS, ALASKA**

This appendix presents the potential Applicable or Relevant and Appropriate Requirements (ARARs) for OB942 at the Cape Romanzof Long-Range Radar Site (LRRS), Alaska. Under the Comprehensive Environmental Response, Compensation, and Liability Act, three types of ARARs are considered:

- Chemical-specific (Table A-1)
- Location-specific (Table A-2)
- Action-specific (Table A-3)

Each ARAR has been assessed based on its applicability to the site, and categorized as applicable or relevant and appropriate. In addition, U.S. Environmental Protection Agency guidance documents identify items to be considered (TBCs). TBCs are not considered legally enforceable but are evaluated along with ARARs as part of the risk assessment to set protective cleanup level targets.

## CHEMICAL-SPECIFIC ARARS

Chemical-specific ARARs provide cleanup values that establish acceptable contaminant concentrations that may remain following a remedial response (Table A-1). The Alaska Administrative Code (AAC), Title 18, Chapter 75, Article 3, *Oil and Hazardous Substances Pollution Control Regulations – Discharge Reporting, Cleanup, and Disposal of Oil and Other Hazardous Substances*, Method Two soil cleanup criteria [18 AAC 75.341(c) and (d)] – Tables B1 and B2) establish the applicable chemical-specific soil cleanup values (ADEC 2016). The regulation lists soil cleanup criteria for lead and antimony. The standards applicable at the Cape Romanzof LRRS are for sites located in a non-arctic zone with annual precipitation of less than or equal to 40 inches.

**Table A-1  
Chemical-Specific ARARs**

Regulation	Description	A or RA	Rationale
RCRA of 1976 as amended by the hazardous and solid waste amendments of 1984, Subtitles C and D, other than corrective action requirements (U.S. Code, Title 42, Section 6901 [42 USC 6901])	Establishes protections and protocols for the creation and recycling of waste including cradle to grave manifesting.	A	Excavated materials designated as waste (e.g., contaminated soils) are subject to the requirements of RCRA.
Alaska Oil and Other Hazardous Substance Pollution Control regulations (18 AAC 75.340-341)	Governs discharge of oil and hazardous substances and state cleanup requirements. Also establishes soil cleanup levels.	A	Cleanup levels for soil, methods for determination and application of cleanup levels.  The site is known to be affected by a release of metals.
U.S. Environmental Protection Agency Ecological Soil Screening Levels (Eco-SSL) Office of Solid Waste and Emergency Response (OSWER) Directives 9285.7-70 and 9285.7-61	Ecological soil screening levels.	TBC	Concentrations of contaminants in soil that are protective of ecological receptors that commonly come into contact with and/or consume biota that live in or on soil. Lead levels exceeded the Eco-SSL at OB942.

**Notes:**

A = applicable

RA = relevant and appropriate

TBC = to be considered

For definitions, refer to the Acronyms and Abbreviations section in the ROD.

## **LOCATION-SPECIFIC ARARS**

Location-specific ARARs are restrictions developed on the conduct of activities at specific locations (Table A-2). These ARARs may restrict or preclude certain remedial actions, or they may apply only to certain portions of an installation. Location-specific factors that may require the identification of ARARs include sensitive habitats, floodplains, wetlands, endangered species habitat, fault locations, and historic or archeological resources.

**Table A-2  
Location-Specific ARARs**

<b>Regulation</b>	<b>Description</b>	<b>A or RA</b>	<b>Rationale</b>
Bald and Golden Eagle Protection Act (16 USC 668-668c) Migratory Bird Treaty Act of 1972 (16 USC 703-712 [§709 has been omitted]; 50 CFR Title Sections 10, 20 and 21)	Protects bald and golden eagles/habitat in the area and provides for permitted activities.	A	Bald or golden eagles have not been identified in the project area, but the possibility for their presence exists.
Migratory Bird Treaty Act (37 Stat. 878, Ch. 45; 16 USC 703-712 [§709 has been omitted]; 50 CFR Parts 10, 20, 21)	Prohibits taking or possession of any migratory bird listed including parts, nests, or products.	A	Considered for possible impacts to birds at Cape Romanzof LRRS.
Clean Water Act – Section 404 [33 USC 1344; 40 CFR 230: Section 404(b)(1)]	Establishes a program to regulate the discharge or dredged and fill material into waters of the United States, including wetlands.	A	Considered for possible impacts to wetlands at Cape Romanzof LRRS. According to the National Wetlands Inventory Mapper, OB942 is between two freshwater emergent wetlands and surface water has been observed at the site. Several wetland areas are also located along the road from Lower Camp to the airstrip.

**Notes:**

A = applicable

RA = relevant and appropriate

For definitions, refer to the Acronyms and Abbreviations section in the ROD.



## **ACTION-SPECIFIC ARARS**

Action-specific ARARs are requirements that apply to specific investigative or remedial actions (Table A-3). Action-specific requirements do not in themselves determine remedial alternatives; they indicate how a selected alternative must be achieved. Action-specific ARARs are refined during remedial design as specific information becomes available.

**Table A-3  
Action-Specific ARARs**

Regulation	Description	A or RA	Rationale
Alaska Spill Reporting and Notification (18 AAC 75.300 et. al)	<p>Specifies sampling and analysis of soil, surface water, and groundwater resulting from the discharge of oil or a hazardous substance.</p> <p>Specifies soil, surface water, and groundwater cleanup levels resulting from the discharge of oil or a hazardous substance.</p> <p>Specifies institutional controls for residual soil, surface water, and groundwater left in excess of cleanup levels resulting from a discharge of oil or a hazardous substance.</p>	A	<p>18 AAC 75.355 lists requirements for sampling and analysis.</p> <p>18 AAC 75.360 lists requirements for cleanup work plans.</p> <p>18 AAC 75.375 lists requirements for institutional controls.</p> <p>18 AAC 75.380 lists requirements for reporting.</p>

**Notes:**

A = applicable

RA = relevant and appropriate

For definitions, refer to the Acronyms and Abbreviations section in the ROD.

**APPENDIX B**  
**Conceptual Site Model**

# HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Cape Romanzof LRRS OB942 Open Burn Area

Completed By: E. McDonald, Jacobs Engineering

Date Completed: 28 October 2016

**Instructions:** Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.

(1) Check the media that could be directly affected by the release.	(2) For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.
Media	Transport Mechanisms
<input checked="" type="checkbox"/> Surface Soil (0-2 ft bgs)	<input checked="" type="checkbox"/> Direct release to surface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to subsurface <i>check soil</i> <input type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Runoff or erosion <i>check surface water</i> <input checked="" type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Subsurface Soil (2-15 ft bgs)	<input checked="" type="checkbox"/> Direct release to subsurface soil <i>check soil</i> <input type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input checked="" type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Ground-water	<input type="checkbox"/> Direct release to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Flow to surface water body <i>check surface water</i> <input type="checkbox"/> Flow to sediment <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Surface Water	<input type="checkbox"/> Direct release to surface water <i>check surface water</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Sedimentation <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Sediment	<input type="checkbox"/> Direct release to sediment <i>check sediment</i> <input type="checkbox"/> Resuspension, runoff, or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____

(3) Check all exposure media identified in (2).	(4) Check all pathways that could be complete. The pathways identified in this column <b>must</b> agree with Sections 2 and 3 of the Human Health CSM Scoping Form.	(5) Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.																					
Exposure Media	Exposure Pathway/Route	Current & Future Receptors																					
		Residents (adults or children) Commercial or Industrial workers Site visitors, trespassers, or recreational users Construction workers Farmers or subsistence harvesters Subsistence consumers Other																					
<input checked="" type="checkbox"/> soil	<input checked="" type="checkbox"/> Incidental Soil Ingestion <input checked="" type="checkbox"/> Dermal Absorption of Contaminants from Soil <input type="checkbox"/> Inhalation of Fugitive Dust	<table border="1"> <tr> <td>F</td> <td>C/F</td> <td>F</td> <td>F</td> <td>F</td> <td></td> <td></td> </tr> <tr> <td>F</td> <td>C/F</td> <td>F</td> <td>F</td> <td>F</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	F	C/F	F	F	F			F	C/F	F	F	F									
F	C/F	F	F	F																			
F	C/F	F	F	F																			
<input type="checkbox"/> groundwater	<input type="checkbox"/> Ingestion of Groundwater <input type="checkbox"/> Dermal Absorption of Contaminants in Groundwater <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water	<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>																					
<input type="checkbox"/> air	<input type="checkbox"/> Inhalation of Outdoor Air <input type="checkbox"/> Inhalation of Indoor Air <input type="checkbox"/> Inhalation of Fugitive Dust	<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>																					
<input type="checkbox"/> surface water	<input type="checkbox"/> Ingestion of Surface Water <input type="checkbox"/> Dermal Absorption of Contaminants in Surface Water <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water	<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>																					
<input type="checkbox"/> sediment	<input type="checkbox"/> Direct Contact with Sediment	<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>																					
<input checked="" type="checkbox"/> biota	<input checked="" type="checkbox"/> Ingestion of Wild or Farmed Foods	<table border="1"> <tr> <td>F</td> <td></td> <td></td> <td></td> <td></td> <td>F</td> <td></td> </tr> </table>	F					F															
F					F																		

# Human Health Conceptual Site Model Scoping Form

Site Name:	Cape Romanzof LRRS OB942 Open Burn Area
File Number:	2526.38.021
Completed by:	E. McDonald, Jacobs Engineering

## Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

**General Instructions:** *Follow the italicized instructions in each section below.*

## 1. General Information:

**Sources** (*check potential sources at the site*)

<input type="checkbox"/> USTs	<input type="checkbox"/> Vehicles
<input type="checkbox"/> ASTs	<input type="checkbox"/> Landfills
<input type="checkbox"/> Dispensers/fuel loading racks	<input type="checkbox"/> Transformers
<input type="checkbox"/> Drums	<input checked="" type="checkbox"/> Other: Burn barrels, burned waste and munitions constituents (MCs), buried anomalies

**Release Mechanisms** (*check potential release mechanisms at the site*)

<input type="checkbox"/> Spills	<input type="checkbox"/> Direct discharge
<input type="checkbox"/> Leaks	<input checked="" type="checkbox"/> Burning
	<input type="checkbox"/> Other:

**Impacted Media** (*check potentially-impacted media at the site*)

<input checked="" type="checkbox"/> Surface soil (0-2 feet bgs*)	<input type="checkbox"/> Groundwater
<input checked="" type="checkbox"/> Subsurface soil (>2 feet bgs)	<input type="checkbox"/> Surface water
<input type="checkbox"/> Air	<input checked="" type="checkbox"/> Biota
<input type="checkbox"/> Sediment	<input type="checkbox"/> Other:

**Receptors** (*check receptors that could be affected by contamination at the site*)

<input type="checkbox"/> Residents (adult or child)	<input checked="" type="checkbox"/> Site visitor
<input checked="" type="checkbox"/> Commercial or industrial worker	<input checked="" type="checkbox"/> Trespasser
<input checked="" type="checkbox"/> Construction worker	<input checked="" type="checkbox"/> Recreational user
<input checked="" type="checkbox"/> Subsistence harvester (i.e. gathers wild foods)	<input type="checkbox"/> Farmer
<input checked="" type="checkbox"/> Subsistence consumer (i.e. eats wild foods)	<input checked="" type="checkbox"/> Other: Future residents

**2. Exposure Pathways:** *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.) ☒

*If the box is checked, label this pathway complete:*

Complete

Comments:

Lead and antimony were analyzed for in surface soil. All results were below the most stringent ADEC cleanup levels. Additional data may be needed to assess risk from possible contamination related to burning.  
Munitions debris and MCs present a physical hazard in soil.

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)? ☒

*If both boxes are checked, label this pathway complete:*

Complete

Comments:

There are no known contaminants present in the soil above cleanup levels. Additional data may be needed to assess risk from possible contamination related to burning.

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future? ☐

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350. ☒

*If both boxes are checked, label this pathway complete:*

Incomplete

Comments:

Groundwater has not been sampled at OB942. Additional data may be needed to assess risk from possible contamination related to burning.  
Well Number 1, located at Lower Camp (approximately 1.75 miles upgradient of OB942), is the drinking water source at Cape Romanzof LRRS.

## 2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future?

☐

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).

☒

*If both boxes are checked, label this pathway complete:*

Incomplete

Comments:

No surface water samples have been collected at OB942. Surface water flowing across OB942 may provide a mechanism for potential contamination of the wetlands and Fowler (Nilumat) Creek by MCs.

## 3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods?

☒

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)?

☒

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.)

☒

*If all of the boxes are checked, label this pathway complete:*

Complete

Comments:

Low levels of lead (up to 13 mg/kg) are present in soils. Lead has the potential to bioaccumulate and is present within the root zone of plants and could conceivably be ingested by burrowing animals.

### c) Inhalation-

#### 1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

☐

Are the contaminants in soil volatile (see Appendix D in the guidance document)?

☐

*If both boxes are checked, label this pathway complete:*

Incomplete

Comments:

## 2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminated soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures)

☐

Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)?

☐

*If both boxes are checked, label this pathway complete:*

Incomplete

Comments:



**3. Additional Exposure Pathways:** *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

**Dermal Exposure to Contaminants in Groundwater and Surface Water**

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

*Check the box if further evaluation of this pathway is needed:*

☐

Comments:

**Inhalation of Volatile Compounds in Tap Water**

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

*Check the box if further evaluation of this pathway is needed:*

☐

Comments:

## Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM<sub>10</sub>). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.
- Chromium is present in soil that can be dispersed as dust particles of any size.

Generally, DEC direct contact soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because it is assumed most dust particles are incidentally ingested instead of inhaled to the lower lungs. The inhalation pathway only needs to be evaluated when very small dust particles are present (e.g., along a dirt roadway or where dusts are a nuisance). This is not true in the case of chromium. Site specific cleanup levels will need to be calculated in the event that inhalation of dust containing chromium is a complete pathway at a site.

*Check the box if further evaluation of this pathway is needed:*

☐

Comments:

## Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

*Check the box if further evaluation of this pathway is needed:*

☐

Comments:

No sediment samples have been collected at OB942.

**4. Other Comments** *(Provide other comments as necessary to support the information provided in this form.)*

**OB942 Ecoscoping Graphic  
Cape Romanzof LRRS**

Primary Sources	Release Mechanisms	Secondary Sources	Transport Mechanisms	Exposure Media	Exposure Route	Ecological Receptors				
						Vegetation	Invertebrates	Reptiles and Amphibians	Fish	Birds and Mammals
Small Arms Debris	Burning Plant and Animal Uptake	Surface soils	Groundwater Flow/Seepage/Runoff	Surface soil	Direct contact or Uptake	•	•	—	—	•
					Incidental ingestion	—	•	—	—	•
					Food chain	—	—	—	—	—
				Subsurface soil	Ingestion	—	—	—	—	—
					Food chain	—	—	—	—	—
				Surface water	Direct contact or Absorption	—	—	—	—	—
					Ingestion	—	—	—	—	—
					Food chain	—	—	—	—	—
				Sediment	Direct contact or Absorption	—	—	—	—	—
					Ingestion	—	—	—	—	—
					Food chain	—	—	—	—	—
				Biota	Food chain	—	•	—	—	•
				Groundwater	Evaluated as surface water at discharge points					
				Air	Inhalation	—	—	—	—	—
			Volatilization							

• Complete pathway  
 — Incomplete pathway

## Ecoscoping Form

**Site Name:** OB942, Cape Romanzof LRRS, Alaska

**Completed by:** Jacobs Engineering Group Inc.

**Date:** 13 September 2016

*Instructions: Follow the italicized instructions in each section below. "Off-ramps," where the evaluation ends before completing all of the sections, can be taken when indicated by the instructions. Comment boxes should be used to help support your answers.*

### 1. Direct Visual Impacts and Acute Toxicity

Are direct impacts that may result from the site contaminants evident, or is acute toxicity from high contaminant concentrations suspected? *Check the appropriate box.*

- ☐ Yes – Describe observations below and evaluate all of the remaining sections without taking any off-ramps.
- ☒ No – Go to next section.

Comments:

Munitions constituents (MCs) and low levels of lead are present at the open burn area.

### 2. Terrestrial and Aquatic Exposure Routes

*Check each terrestrial and aquatic route that could occur at the site.*

#### Terrestrial Exposure Routes

- ☐ Exposure to water-borne contaminants as a result of wading or swimming in contaminated waters or ingesting contaminated water.
- ☐ Contaminant uptake in terrestrial plants whose roots are in contact with contaminated surface water.
- ☐ Contaminant migration via saturated or unsaturated groundwater zones and discharge at upland "seep" locations (not associated with a wetland or waterbody).
- ☒ Contaminant uptake by terrestrial plants whose roots are in contact with soil moisture or groundwater present within the root zone (generally no more than 4 feet below ground surface).
- ☒ Particulates deposited on plants directly or from rain splash.
- ☒ Incidental ingestion and/or exposure while animals grub for food, burrow (up to 2 feet for small animals or 6 feet for large animals), or groom.

- ☐ Inhalation of fugitive dust or vapors disturbed by foraging or burrowing activities.
- ☒ Bioaccumulatives (other than PAHs, which bioaccumulate more readily in aquatic environments) taken up by soil invertebrates, which are in turn eaten by higher food chain organisms (see the *Policy Guidance on Developing Conceptual Site Models*).
- ☐ Other site-specific exposure pathways.

#### Aquatic Exposure Routes

- ☐ Contaminated surface runoff migration to water bodies through swales, drainage ditches, or overland flow.
- ☐ Aquatic receptors exposed through osmotic exchange, respiration, or ventilation of surface waters.
- ☐ Contaminant migration via saturated or unsaturated groundwater zones and discharge at “seep” locations along banks or directly to surface water.
- ☐ Deposition into sediments from upwelling of contaminated groundwater.
- ☐ Aquatic receptors may be exposed directly to contaminated sediments through foraging or burrowing, or indirectly exposed due to osmotic exchange, respiration, or ventilation of sediment pore water.
- ☐ Aquatic plants rooted in contaminated sediments.
- ☐ Bioaccumulatives (see the *Policy Guidance on Developing Conceptual Site Models*) taken up by sediment invertebrates, which are in turn eaten by higher food chain organisms.
- ☐ Other site-specific exposure pathways.

*If any of the above boxes are checked, go on to the next section. If none are checked, end the evaluation and check the box below.*

☐ OFF-RAMP: NO FURTHER ECOLOGICAL EVALUATION NECESSARY

Comments:

### **3. Habitat**

*Check all that may apply. See *Ecoscoping Guidance* for additional help.*

- ☒ Habitat that could be affected by the contamination supports valued species (i.e., species that are regulated, used for subsistence, have ceremonial importance, have commercial value, or provide recreational opportunity).
- ☒ Critical habitat or anadromous stream in an area that could be affected by the contamination.
- ☐ Habitat that is important to the region that could be affected by the contamination.

- ☒ Contamination is in a park, preserve, or wildlife refuge.

*If any of the above boxes are checked, go on to the next scoping factor. If none are checked, end the evaluation and check the box below.*

☐ OFF-RAMP: NO FURTHER ECOLOGICAL EVALUATION NECESSARY

Comments:

Fowler (Nilumat) Creek, an anadromous stream, empties into Kokechik Bay, an important resource for subsistence gathering of shellfish and herring spawn. Cape Romanzof LRRS is also within the Yukon Delta National Wildlife Refuge.

#### 4. Contaminant Quantity

*Check all that may apply. See Ecoscoping Guidance for additional help.*

- ☐ Endangered or threatened species are present.
- ☐ The aquatic environment is or could be affected.
- ☒ Non-petroleum contaminants may be present, or the total area of petroleum-contaminated surface soil exceeds one-half acre.

*If any of the above boxes are checked, go on to the next scoping factor. If none are checked, end the evaluation and check the box below.*

☐ OFF-RAMP: NO FURTHER ECOLOGICAL EVALUATION NECESSARY

Comments:

Endangered species are not known to be present. Surface soils are not known to contain petroleum contaminants; however, MCs and low levels of lead are present in surface soils.

#### 5. Toxicity Determination

*Check all that apply.*

- ☒ Bioaccumulative chemicals are present (see *Policy Guidance on Developing Conceptual Site Models*).
- ☐ Contaminants exceed benchmark levels (see the Ecological Benchmark Tool in RAIS, available at: [http://rais.ornl.gov/tools/eco\\_search.php](http://rais.ornl.gov/tools/eco_search.php)).

*If either box is checked, complete a detailed Ecological Conceptual Site Model (see DEC's Policy Guidance on Developing Conceptual Site Models) and submit it with the form to your DEC project manager.*

*If neither box is checked, check the box below and submit this form to your DEC project manager.*

☐ OFF-RAMP: NO FURTHER ECOLOGICAL EVALUATION NECESSARY

Comments:

Low levels of lead are present in surface soils and lead has the potential to bioaccumulate. Lead concentrations in soil were compared to the EPA's ecological soil screening level (Eco-SSL) value for lead and two soil sample results exceeded (12 and 13 mg/kg) and two sample results equal the Eco-SSL of 11 mg/kg. However, the area at OB942 with lead greater than or equal to the EPA Eco-SSL is extremely small when compared to the home range of the EPA's indicator species (birds) from which this screening level was derived.



**APPENDIX C**  
**Community Participation**

## **Public Comment Period Cape Romanzof OB942 Proposed Plan**

The U.S. Air Force (Air Force) announces the availability of the Proposed Plan for OB942, Open Burn Area. The Proposed Plan describes the site history, nature and extent of contamination, the remedial alternatives considered, as well as the preferred alternative for soil with munitions constituents at OB942. The chemical of concern is primarily associated with small-caliber ammunition.

The public comment period for the Proposed Plan is open through 11 April 2016. The Air Force encourages interested individuals to provide feedback, comments, and suggestions regarding the proposed remedy. The U.S. Air Force will accept verbal and written comments on the Proposed Plan during the public comment period, and a public meeting will be held if one is requested during the public comment period.

Copies of the Proposed Plan were distributed to the Scammon Bay, Hooper Bay, Chevak, and Paimuit communities in March. Copies can also be obtained from the Air Force Remedial Project Manager, Richard Mauser, who can be reached via email at [richard.mauser@us.af.mil](mailto:richard.mauser@us.af.mil) or by telephone at 1-800-222-4137 or directly at 907-552-0788.

THE DELTA DISCOVERY NEWSPAPER  
P.O. BOX 1028  
BETHEL, AK 99559

AO/PO# \_\_\_\_\_  
CASE NO. \_\_\_\_\_

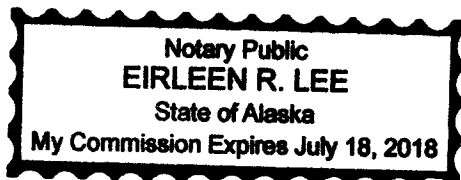
Jacobs (Re: Cape Romanzof OB942 Plan)  
NAME OF PETITIONER  
4300 B Street, Suite 600  
Anchorage, AK 99503  
ADDRESS OF PETITIONER

AFFIDAVIT OF PUBLICATION

UNITED STATES OF AMERICA, STATE OF ALASKA, 4<sup>th</sup> DIVISION, BEFORE ME, THE UNDERSIGNED, A NOTARY PUBLIC THIS DAY PERSONALLY APPEARED, Kelly J. Lincoln, WHO, BEING FIRST DULY SWORN, ACCORDING TO LAW, SAYS THAT SHE IS THE Office Manager OF THE DELTA DISCOVERY NEWSPAPER, PUBLISHED IN BETHEL IN SAID DIVISION 4<sup>th</sup> AND STATE OF ALASKA AND THAT THE ADVERTISEMENT, OF WHICH THE ANNEXED IS A TRUE COPY, WAS PUBLISHED IN SAID PUBLICATION ON 3/16/16 AND THEREFORE FOR A TOTAL OF 2 CONSECUTIVE ISSUE(S). THE LAST PUBLICATION APPEARING ON 3/23/16 AND THAT THE RATE CHARGED THEREON IS NOT IN EXCESS OF THE RATE CHARGED TO PRIVATE INDIVIDUALS.

Kelly J. Lincoln  
KELLY JEAN LINCOLN  
OFFICE MANAGER,  
THE DELTA DISCOVERY NEWSPAPER

SWORN TO ME BEFORE ON December 1, 2015



Eirleen R. Lee  
SIGNATURE OF NOTARY

Eirleen R. Lee  
PRINTED NAME OF NOTARY

MY COMMISSION EXPIRES ON July 18, 2018

## McDonald, Erika

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**From:** Plucinski, Timothy <timothy\_plucinski@fws.gov>  
**Sent:** Wednesday, April 13, 2016 11:43 AM  
**To:** McDonald, Erika  
**Subject:** Re: FA8903-08-D-8773 TO 166 Proposed Plan for OB942, Cape Romanzof LRRS, Distribution of Final

Hi, Erika, I'm so very sorry for the late response from the USFWS and I'm sure you've moved forward, rightfully so. It's that time of year where we are all gearing up for the crazy field season. I did forward the Proposed Plan to the Refuge for their review and I personally did not hear back from them so my guess is that they did not have serious concerns with the document ... but, it could be that you heard from them directly.

As for my review, I do not have any formal comments on the Proposed Plan since this site potentially poses more of a physical human health risk than anything, and the site is currently on Air Force property. The only comment I would make is that DoD agencies have made a pretty big push recently to downsize the property for which they are responsible in order to reduce their liability. Assuming that sometime in the future the Air Force would like to incorporate portions of the property into the Yukon Delta NWR, please note the USFWS will not accept the responsibilities associated properties with land-use or institutional controls. Therefore, the USFWS would suggest the Air Force address the hazards related to the munitions and remove contaminated material at the site in order to eliminate all human and environmental risk.

Thanks again for keeping the USFWS informed of work on Air Force properties ... we certainly do appreciate it.

Tim

*Tim Plucinski  
Environmental Contaminants Biologist  
Alaska Maritime National Wildlife Refuge  
US Fish and Wildlife Service  
1011 East Tudor Road  
Anchorage, Alaska 99503  
(907) 786-3464*

On Thu, Mar 10, 2016 at 12:13 PM, McDonald, Erika <[Erika.McDonald@jacobs.com](mailto:Erika.McDonald@jacobs.com)> wrote:

Good afternoon,

Attached please find the transmittal letter and PDF copy of the final Proposed Plan for OB942, Cape Romanzof LRRS. Hardcopies and/or CDs to follow in the mail/in person over the next couple of days. A notice will also be placed in *The Delta Discovery* paper. The public comment period is open through 11 April 2016. A public meeting will be held if requested during the public comment review process.

Please let us know if you have any questions, concerns, or comments.

Sincerely,

Erika

Erika L. McDonald

Jacobs

Environmental Scientist

907.751.3434

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**APPENDIX D**  
**Responses to Comments**

REVIEW  
COMMENTS

PROJECT: RECORD OF  
DECISION FOR OB942 DRAFT

LOCATION: CAPE ROMANZOF LRRS, ALASKA

ADEC		DATE: 26 October 2016 REVIEWER: Louis Howard PHONE: 907-269-7552	ACTION TAKEN ON COMMENT BY: Jacobs Engineering Group Inc.		
Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE		ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
1.	Section 1.1, page 1-1	<b>Site Name and Location</b> <b>2<sup>nd</sup> Paragraph</b> The text states: "OB942 is an area where military personnel burned waste and munitions constituents (MCs)." ADEC suggests revising the sentence to read as follows: ""OB942 is an area where military personnel disposed of small arms ammunition (SAA) by burning."	Accepted. The first sentence in the second paragraph of Section 1.1 will be updated to read: "OB942 is an area where military personnel disposed of small arms ammunition by burning."		A
2.	Section 1.2, page 1-2	<b>Statement of Basis and Purpose</b> The text states: "This decision is based on the Administrative Record file for OB942." The document, in various places, states the files for OB942 can be found in the "Administrative Record", but does not list where the reader can access the files, either electronically or in person at a specific location. ADEC requests AFCEC clarify in the text of the document where the administrative record can be accessed (e.g. afcec.publicadmin-record.us.af.mil).	Accepted. The text in Section 1.2 will be updated to the following: "This decision is based on the Administrative Record file for Cape Romanzof LRRS, which can be accessed at the following website: <a href="http://afcec.publicadmin-record.us.af.mil/Search.aspx">http://afcec.publicadmin-record.us.af.mil/Search.aspx</a> "		A
3.	Section 1.4, page 1-8	<b>Description of the Selected Remedy</b> <b>2<sup>nd</sup> Bullet</b> The text states: "File a notice of contamination with the USAF real property office and with State of Alaska land	Accepted. The second item in the bulleted list in Section 1.4 will be updated to read: "File a notice of environmental contamination with the USAF real property office and with State of Alaska Department of Natural Resources land records." In addition, the text in Section 2.4 will be updated to read: "LUCs will include dig restrictions and signage, and the USAF will file a notice of		A

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		records.”  The text should state: “File a notice of environmental contamination with the USAF real property office and with State of Alaska Department of Natural Resources land records.”  ADEC requests AFCEC perform of global change for notice of contamination to “notice of environmental contamination” in the document.	environmental contamination with the USAF real property office and with State of Alaska Department of Natural Resources land records.”	
4.	Section 1.5, page 1-8	<b>Statutory Determinations</b>  The text states: “Because this remedy will result in MCs remaining onsite above levels that allow for unlimited use and unrestricted exposure (UU/UE)...”  Actually MC’s are not above levels that allow for UU/UE. The reason for the IC’s is the potential (low) for MEC in uninvestigated anomalies <sup>1</sup> remaining on the sites. Revise text to reflect this fact.	Accepted. Several places in text will be clarified to this effect, including the final paragraph in Section 1.3:  “The response action selected in this ROD is necessary to protect human health or welfare or the environment from actual or threatened releases of pollutants or contaminants (i.e. <u>small arms debris, subsurface anomalies, MCs in uncharacterized areas</u> ) from this site, which may present an imminent and substantial endangerment to public health or welfare.”  Paragraph 2 of Section 1.4:  “LUCs will be implemented to restrict invasive and residential activities and protect human health from exposure to small arms debris, which is known to be present onsite. Additionally, this remedy will eliminate the physical exposure hazards presented by the potential presence of MEC and munitions debris as well as the	A

<sup>1</sup> The field team inspected the Open Burn Area discovered on September 27, 2011. The area was surveyed with a White’s All-Metal detector to identify any metal anomalies that could be small arms projectiles, which could indicate an MC source. Subsurface anomalies were detected that could potentially indicate buried small arms. The field team collected soil samples from the impact area based on results from the metal detector. No additional subsurface sampling was conducted due to the large amount of small arms debris and the unknown nature of the subsurface. 5.6 Environmental Media Sampling and Analysis, Open Burn Area and Small Arms Use Area. CSE Phase I/II Final Report (October 2013).



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Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE		ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
			<p>chemical hazards associated with any unidentified MCs in areas that were not sampled. MCs are defined as materials originating from unexploded ordnance, discarded military munitions, or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions (10 USC 2710(e)(3).</p> <p>The last two sentences in Section 1.5:</p> <p>“CERCLA five-year reviews will be required to ensure that the remedy is, or will be, protective of human health and the environment. Small arms debris is known to be present onsite, and will remain onsite indefinitely. It is possible that MEC, munitions debris, and MCs pertaining to uninvestigated subsurface anomalies are present and will remain onsite above levels that allow for unlimited use and unrestricted exposure.”</p> <p>The beginning of the second paragraph in Section 2.1.3:</p> <p>OB942 is an open burn area. The USAF has identified small arms debris and unidentified anomalies as the main physical hazard posing potential risks to human health and the environment at OB942. Associated MCs present a chemical hazard that is within acceptable limits in characterized areas; analytical results indicated that lead is present in concentrations below the ADEC Method Two soil cleanup level of 400 mg/kg.</p> <p>Section 2.7.1, first sentence of human exposure assessment:</p> <p>The human health CSM describes the potential relationship or exposure pathway for small arms debris, subsurface anomalies, and potential MC-contaminated soil at OB942 and both potential current and potential future human receptors.</p> <p>Section 2.7.1, third sentence under human exposure assessment:</p> <p>If achieved, the RAO developed for OB942 (Section 2.8) will adequately mitigate future human health risks related to both known and potential physical and chemical</p>		

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Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE		ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
			<p>hazards related to former site use.</p> <p>Section 2.7.1, first sentence under second paragraph of human exposure assessment: ‘MCs’ will be changed to ‘physical and/or chemical hazards’</p> <p>Table 2-5, several revisions to key assumptions, advantages, and disadvantages.</p> <p>Introduction to Section 2.9.1, ‘MCs’ will be changed to ‘potential hazards’; and in the description of Alternative 4, bulleted list, ‘MCs’ will be changed to debris in the appropriate instances.</p> <p>Second paragraph of Section 2.10.5, the first two sentences will read: “Under the No Action alternative, no efforts to protect potential human and ecological receptors would take place. Therefore, the No Action alternative does not provide short-term effectiveness. Under Alternative 2, LUCs would provide moderate short-term effectiveness by eliminating the potential for exposure to potential hazards, which would remain indefinitely.”</p> <p>Also in Section 2.10.5: “The MCs would remain indefinitely,” will be removed. “Removal of MCs” will become “removal of potential hazards.” “expose site workers to MCs” will become “create an exposure risk to site workers”</p> <p>‘MCs’ will be changed to ‘debris’ in paragraph 3 of Section 2.10.6. ‘MCs’ will become ‘affected soil and debris’ in Section 2.10.7.</p> <p>The first sentence of Section 2.12.1 will be revised: “The selected remedy under Alternative 2, LUCs, is designed to minimize or eliminate the potential for human exposure to small arms debris, MCs, and subsurface anomalies that may include MEC or munitions debris.”</p>		

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Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE	ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)

			<p>‘MC signage’ will become ‘signage’ in Section 2.13.3.</p> <p>‘and debris’ will be added after MCs in the last sentence of Section 2.13.5.</p> <p>‘MCs’ will become ‘potential hazards’ in the introductory sentence of Part 3.</p>	
5.	Section 1.6, page 1-9	<p><b>Data Certification Checklist</b></p> <p>The text states: “Additional information can be found in the Administrative Record file for this site.”</p> <p>See comment #1 above regarding where the reader can find information regarding the location of the Administrative Record file.</p>	<p>Accepted. The first sentence in Section 1.6 will be revised as follows:</p> <p>“The following information is included in the Decision Summary located in Part 2 of this ROD; additional information can be found in the Administrative Record file for this site (refer to Section 1.2).”</p> <p>See also Response #2.</p>	A
6.	Section 2.1.3, pages 2-3 & 2-4	<p><b>Facility Military Munitions Response Program History</b></p> <p><b>Page 2-3 &amp; 2-4</b></p> <p>The text states: “There was no evidence of historical use of explosives, and no MEC were observed during the CSE Phase I/II; however, their presence cannot be ruled out.”</p> <p>Please revise to state: “There was no evidence of historical use of explosives, and no MEC or MD were observed during</p>	<p>Accepted. The end of Section 2.1.3, paragraph 2 will be updated to state:</p> <p>“There was no evidence of historical use of explosives, and no MEC or munitions debris-related items were observed during the CSE Phase I/II; however, their presence in the subsurface cannot be ruled out. Small arms debris was observed during the visual survey (USACE 2013). A separate site investigation for fuel-related contamination at OB942 was underway at the time this ROD was prepared (refer to Section 3.2).”</p>	A

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		<p>the CSE Phase I/II: however their presence in the subsurface<sup>2</sup> cannot be ruled out.”</p> <p><b>Page 2-4</b></p> <p><b>Last sentence</b></p> <p>The text states: “full description of previous environmental work conducted at the LRRS – including 17 ERP sites – can be found in the Administrative Record for the Cape Romanzof LRRS.”</p> <p>See comment #1 above regarding where the reader can find the Administrative Record for previous environmental work conducted at the LRRS.</p>	<p>Accepted. The last sentence in Section 2.1.3 will be revised:</p> <p>“A full description of previous environmental work conducted at the LRRS – including 17 ERP sites – can be found in the Administrative Record for the Cape Romanzof LRRS (refer to Section 1.2).”</p> <p>See also Response #2.</p>	
7.	Section 2.3, page 2-8	<p><b>Community Participation</b></p> <p>See comment #1 above regarding where the reader can find the Administrative Record containing the Proposed Plan, newsletters, fact sheets and community relations documents relating to the MMRP and ERP sites at the Cape Romanzof LRRS.</p>	<p>Accepted. The last sentence in Section 2.3 will be revised:</p> <p>“A full description of previous environmental work conducted at the LRRS – including 17 ERP sites – can be found in the Administrative Record for the Cape Romanzof LRRS (refer to Section 1.2).”</p> <p>See also Response #2.</p>	A
8.	Section 2.4, page 2-8	<p><b>Scope and Role of Operable Unit or Response Action</b></p> <p>The text states: “LUCs will be implemented</p>	<p>Accepted. The first paragraph of Section 2.4 will be updated to read:</p> <p>“Under its lead agency authority, USAF plans to use LUCs in order to protect human receptors from encountering small arms debris, subsurface anomalies, and</p>	A

<sup>22</sup> “The field team collected soil samples from the impact area based on results from the metal detector. No additional subsurface sampling was conducted due to the large amount of small arms debris and the unknown nature of the subsurface.” 5.6 Environmental Media Sampling CSE Phase I/II Final Report (October 2013)

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		<p>to restrict invasive and residential activities and protect human health from exposure to MCs associated with small arms debris.”</p> <p>There are no MC exceedances to prevent exposure to. Please revise sentence: “LUC’s will be implemented to restrict invasive and residential activities and protect human health from exposure to potential MEC in the subsurface.”</p> <p>The text states: “LUCs will include dig restrictions and signage, and the USAF will file a notice of contamination with the USAF real property office and in Alaska state land records.”</p> <p>See comment #2 above regarding notice of environmental contamination filed with ADNR land records.</p>	<p>uncharacterized MCs. LUCs will be implemented to restrict invasive and residential activities. LUCs will include dig restrictions and signage, and the USAF will file a notice of environmental contamination with the USAF real property office and with State of Alaska Department of Natural Resources land records. Additionally ... ”</p> <p>The first sentence in the second paragraph of Section 2.4 will be revised:</p> <p>Physical hazards, unidentified subsurface anomalies, and the potential for additional MCs in uncharacterized areas will remain at OB942 for more than five years; therefore, CERCLA five-year reviews will be required indefinitely.</p>	
9.	Section 2.5.6, page 2-11	<p><b>Previous Site Characterization Activities</b></p> <p>The text states: “These documents are available in the Administrative Record file for the site.”</p> <p>See comment #1 above regarding where the reader can find the Administrative Record file containing previous investigations pertaining to OB942.</p>	<p>Accepted. The first sentence in Section 2.5.6 will be revised:</p> <p>“This section describes previous investigations pertaining to OB942; related documentation is available in the Administrative Record file for the site (refer to Section 1.2).”</p> <p>See also Response #2.</p>	A
10.	Section 2.5.7, pages 2-12 &	<p><b>Nature and Extent of Contamination</b></p> <p><b>Types of Contamination and the Affected</b></p>	<p>Accepted. The first paragraph will be updated:</p> <p>“The primary COC at OB942 at the Cape Romanzof LRRS is MCs associated with</p>	A

**LOCATION: CAPE ROMANZOF LRRS, ALASKA**

<p>2-13</p>	<p><b>Media</b></p> <p>Page 2-12</p> <p>The text states: “The MCs remaining onsite present a potential physical hazard.”</p> <p>Actually it is the uninvestigated subsurface anomalies remaining on site present a potential physical hazard. Please consider revising text (e.g. “The uninvestigated subsurface anomalies remaining on site present a potential physical hazard.”)</p> <p><b>Conceptual Site Model</b></p> <p><b>Page 2-13</b></p> <p>The text states: “Exposure pathway analysis for exposure to munitions debris and MCs in soil to human and non-human receptors was addressed.”</p> <p>The text should state: “Exposure pathway analysis for exposure to munitions debris and MCs in soil to human and ecological receptors was addressed.”</p> <p>The text states: “Due to the physical hazard presented by munitions debris and MCs in soil, the soil is considered an impacted medium.”</p> <p>Wouldn’t MC’s be a chemical hazard? MEC would be the physical hazard. The</p>	<p>small-caliber ammunition. Small arms debris and uninvestigated subsurface anomalies remaining onsite also present a potential physical hazard. Analytical results indicate that there is lead in soil in concentrations that are below the soil cleanup level (400 mg/kg) within the 2011 investigation area.”</p>          <p>Accepted. The third sentence in the Conceptual Site Model section will be updated:</p> <p>“Exposure pathway analysis for small arms debris, subsurface anomalies, and MCs (if present above acceptable levels) in soil to human and ecological receptors was addressed.”</p>          <p>Accepted. The fourth sentence in the Conceptual Site Model section will be updated:</p> <p>“Due to the physical hazard presented by potential MEC or munitions debris in the subsurface soil, and the potential presence of higher concentrations of MCs in the areas that have not been sampled, soil is considered an impacted medium.”</p>	
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		<p>text should be revised as follows: “Due to the physical hazard presented by potential MEC in the subsurface.....”</p> <p>The text states: “In the absence of surface water and sediment data, and the proximity to various surface water channels adjacent to OB942, the surface water, sediment, and groundwater pathways are potentially complete.”</p> <p>Actually a misleading statement. The pathways are incomplete for the human receptors and potentially complete for ecological receptors<sup>3</sup>. Revise text to reflect this issue.</p> <p>The text states: “Lead levels exceed the EPA ecological soil screening levels (Eco-SSL) for birds (11 mg/kg).”</p> <p>The text should state: “Lead levels exceed the EPA ecological soil screening levels (Eco-SSL) for birds (11 mg/kg) in two locations<sup>4</sup>.”</p>	<p>Accepted. The fifth sentence of the Conceptual Site Model section will be deleted and replaced with:</p> <p>“The groundwater, surface water, and sediment pathways are incomplete for human receptors.”</p> <p>This change will also be reflected in the CSM scoping and graphic forms.</p> <p>The first sentence in paragraph 2 will state:</p> <p>“In the absence of surface water and sediment data, and the proximity to various surface water channels adjacent to OB942, the surface water, sediment, and groundwater pathways are potentially complete for ecological receptors.”</p> <p>Accepted. The fourth sentence of the second paragraph will be updated to read:</p> <p>“Lead levels exceed the EPA ecological soil screening levels (Eco-SSL) for birds (11 mg/kg) in two locations (USACE 2013).”</p>	
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<sup>3</sup> “While concentrations of lead were well below ADEC risk-based cleanup levels for human health, residual lead could potentially be harmful to avian species based on an EPA ecological soil screening level (Eco-SSL) of 11 mg/kg and its ability to bioconcentrate. The maximum concentration of lead detected onsite is 13 mg/kg. Antimony was detected at OB942, but the laboratory was unable to detect concentrations as low as the Eco-SSL (0.27 mg/kg) for mammals. As no site-specific background metals investigation is known to have occurred at the Cape Romanzof LRRS, some uncertainty remains as to whether these low concentrations are naturally occurring or a result of human activities.” OB942 Final Proposed Plan – Summary of Site Risks, Ecological Risks (March 2016)

<sup>4</sup> Figure 6-2 Laboratory Sample Results [Samples C-LS-CR-03-SS-102 (0-6 in.) & C-LS-CR-03-SS-105 (6-12 in.)] Open Burn Area (942) CSE Phase I/II Final Report (October 2013)

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11.	Section 2.7.1, page 2-17	<p><b>Human Health Risks</b></p> <p>The text states: “However, due to the potential physical hazard posed by MCs, as well as for the potential for buried MEC, a response action is necessary.”</p> <p>There are no MC exceedances. If there were they would be chemical hazards not physical. Recommend revising as follows: “However, due to the potential physical for buried MEC, a response action is necessary.”</p>	<p>Accepted. The text will be updated to read:</p> <p>“However, a response action is necessary due to the physical hazards associated with the potential presence of buried MEC or munitions debris and the chemical hazards posed by any MC that might be present in areas that were not sampled.”</p>	A
12.	Section 2.8, page 2-20	<p><b>Remedial Action Objectives</b></p> <p>The text states: “Minimize or eliminate the potential for human exposure to munitions debris, which could present a physical hazard.”</p> <p>Human exposure to MD is not typically an issue. MD is the remnant metal components of munitions that have functioned as intended and is typically inert.</p> <p>Please revise text as follows: “Minimize or eliminate the potential for human exposure to MEC, which could present a physical hazard.”</p>	<p>Accepted. The RAO will be updated to read:</p> <p>“Minimize or eliminate the potential for human exposure to MEC, which could present a physical hazard.”</p>	A
13.	Section 2.12.3, page 2-35	<p><b>Description of the Selected Remedy</b></p> <p><b>2<sup>nd</sup> Paragraph</b></p>	<p>Accepted. Several sentences in the second paragraph will be updated:</p> <p>“The land use at Cape Romanzof LRRS is designated as industrial use only currently and in the future. However, to assess the need for LUCs, the physical hazards</p>	A



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ADEC		DATE: 26 October 2016 REVIEWER: Louis Howard PHONE: 907-269-7552	ACTION TAKEN ON COMMENT BY: Jacobs Engineering Group Inc.	
Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE	ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)

		<p>The text states: "The presence of MCs associated with small arms debris at OB942 creates a physical hazard, causing OB942 to be unsafe for recreational or residential use."</p> <p>There are no MC exceedances. If there were, then they would be chemical hazards not physical.</p> <p>Request revising text as follows: "The potential for MEC to be present in the uninvestigated anomalies at the site presents a potential physical hazard causing OB942 to be unsafe to perform excavation without UXO support."</p> <p><b>5<sup>th</sup> Bullet</b></p> <p>The text states: "The Air Force shall file a notice with the USAF real property office and in State of Alaska land records that describes the nature and location of the pollutants or contaminants and the types and locations of LUCs."</p> <p>See comment #2 above regarding notice of environmental contamination filed with ADNR land records.</p>	<p>presented by potential MEC and/or munitions debris in the subsurface were assessed for UU/UE, particularly under recreational and residential use scenarios. Due to the presence of buried anomalies that represent a potential physical hazard, OB942 was found to be unsafe for recreational or residential use, and any excavation would require unexploded ordnance (UXO) support. LUCs are therefore necessary to preclude such uses and to control the disposition and use of any soil excavated from the site, as MCs may be present in uninvestigated areas. LUCs will be implemented to restrict invasive and residential activities and protect human health from exposure to potential buried MEC. The LUCs will be implemented to encompass OB942's 0.98-acre area (Figure 2-1)."</p> <p>Additional changes:</p> <p>The first bullet will be updated to read:</p> <p>"The Air Force shall maintain the LUCs indefinitely, as <u>buried anomalies</u> would remain in place and OB942 would not be restored for UU/UE."</p> <p>The third bullet will be updated to read:</p> <p>"The Air Force will utilize the base dig permit system, which will prevent activities that could disturb the <u>buried anomalies</u>. The base dig permit system is implemented by 611 CES."</p> <p>The second to last bullet (on page 2-36) will be updated to read:</p> <p>"The Air Force will monitor and inspect all site areas subject to LUCs no less often than once every five years as small arms debris <u>and buried anomalies</u> will remain onsite indefinitely. CERCLA five-year reviews will also be required."</p> <p>Accepted. The fifth bullet will be updated to read:</p> <p>"The Air Force shall file a notice with the USAF real property office and in State of Alaska Department of Natural Resources land records that describes the nature and location of the pollutants or contaminants and the types and locations of LUCs."</p>	
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REVIEW  
COMMENTS

**PROJECT: RECORD OF  
DECISION FOR OB942 DRAFT**

**LOCATION: CAPE ROMANZOF LRRS, ALASKA**

ADEC		DATE: 26 October 2016 REVIEWER: Louis Howard PHONE: 907-269-7552	ACTION TAKEN ON COMMENT BY: Jacobs Engineering Group Inc.	
Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE	ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
14.	Section 2.12.4, page 2-37	<p><b>Summary of Estimated Remedy Costs</b></p> <p>The text states: “If changes to the estimated costs occur, they will be documented in a technical memorandum made available in the Administrative Record, an Explanation of Significant Differences document, and/or a ROD amendment.”</p> <p>See comment #1 above regarding where the reader can find the Administrative Record containing the technical memorandum that would be developed if major changes to the estimated costs are required.</p>	<p>Accepted. The second sentence in Section 2.12.4 will be updated with:</p> <p>“If changes to the estimated costs occur, they will be documented in a technical memorandum, an Explanation of Significant Differences document, and/or a ROD amendment made available in the Administrative Record (refer to Section 1.2).</p> <p>See also Response #2.</p>	A
15.	Part 4, page 4-1	<p><b>References</b></p> <p>Update reference as follows: ADEC. 2016a (November). Oil and Hazardous Substances Pollution Control. Division of Spill Prevention and Response. 18 AAC 75.</p>	<p>Accepted. The 18 AAC 75 reference in Part 4 will be updated to the most recent version (November). Cleanup levels for lead and antimony are unchanged; neither the known extent of contamination nor the selected remedy require changes.</p>	A
16.	Appendix A Table A-1, page A-3	<p><b>Chemical-Specific ARARs</b></p> <p><b>Regulation</b></p> <p>18 AAC 75.340-341</p> <p><b>Rationale</b></p> <p>The text states: “The site is known to be affected by a release of metals constituents”</p> <p>Revise text as follows: “The site is known</p>	<p>Accepted. The text will be updated to read:</p> <p>“The site is known to be affected by a release of metals.”</p>	A

REVIEW  
COMMENTS

PROJECT: RECORD OF  
DECISION FOR OB942 DRAFT

LOCATION: CAPE ROMANZOF LRRS, ALASKA

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Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE		ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
		to be affected by a release of metals”			
17.	General	In order to remove the land use controls at OB942 to achieve UU/UE or “cleanup complete”, AFCEC needs to investigate the anomalies <sup>5</sup> and the petroleum contamination that may be present.	<p>Noted.</p> <p>Section 3.2 will be updated:</p> <p>“Additional analytes, including diesel-range organics; gasoline-range organics; and benzene, toluene, ethylbenzene, and xylenes, <u>were</u> sampled as part of <u>a separate ERP site investigation, which was underway at the time this ROD was prepared.</u> If these analytes are detected in concentrations that exceed ADEC cleanup levels, they will be addressed under the ERP in accordance with State of Alaska regulations and guidance. A separate decision document will be prepared for any additional analytes that are identified as part of ERP sampling planned for the future.”</p>		A

<sup>5</sup> A White’s All Metals detector was used to aid in delineation of the Open Burn Area MRA. No evidence for MEC was encountered. Subsurface anomalies were detected that could potentially indicate buried small arms. 6.1.7 CSE Phase I/II Final Report (October 2013).