



FIVE-YEAR REVIEW

Final

2016 Five-Year Review Report for Sites OT001 and LF002 at Kalakaket Creek Radio Relay Station, Alaska

**United States Air Force
Joint Base Elmendorf-Richardson, Alaska**

April 2016

TABLE OF CONTENTS

	LIST OF ACRONYMS AND ABBREVIATIONS	iii
	EXECUTIVE SUMMARY	1
	FIVE-YEAR REVIEW SUMMARY FORM	1
1	INTRODUCTION	1-1
2	SITE CHRONOLOGY	2-1
3	BACKGROUND	3-1
	3.1 Physical Characteristics	3-1
	3.2 Land and Resource Use.....	3-1
	3.3 History of Contamination.....	3-2
	3.4 Initial Response.....	3-9
	3.5 Basis for Taking Action	3-9
4	REMEDIAL ACTIONS	4-1
	4.1 Remedy Selection	4-1
	4.1.1 Site OT001.....	4-1
	4.1.2 Site LF002	4-3
	4.2 Remedy Implementation.....	4-4
	4.3 System Operation/Operations and Maintenance.....	4-5
5	PROGRESS SINCE THE LAST REVIEW	5-1
6	FIVE-YEAR REVIEW PROCESS	6-1
	6.1 Administrative Components	6-1
	6.2 Community Involvement	6-1
	6.3 Document Review.....	6-1
	6.4 Data Review.....	6-2
	6.4.1 Site OT001 Groundwater Data and Field Inspections.....	6-2
	6.4.2 Site LF002 Groundwater Data and Field Inspections	6-2
	6.5 Site Inspection.....	6-7
	6.6 Local Interviews.....	6-8
7	TECHNICAL ASSESSMENT	7-1
	7.1 Technical Assessment Questions	7-1
	7.1.1 Question A: Is the remedy functioning as intended by the decision documents?.....	7-1
	7.1.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?	7-1
	7.1.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?	7-2
	7.2 Technical Assessment Summary	7-2
8	ISSUES	8-1
9	RECOMMENDATIONS AND FOLLOW-UP ACTIONS	9-1
10	PROTECTIVENESS STATEMENT	10-1
11	NEXT REVIEW	11-1
12	REFERENCES	12-1

LIST OF TABLES

Table 2-1 Chronology of Site Events..... 2-1
Table 3-1 Summary of Site OT001 COCs and Applicable Cleanup Levels..... 3-4
Table 8-1 Issues Associated with Site Conditions or Activities 8-1
Table 9-1 Recommendations and Follow-up Actions 9-1

LIST OF FIGURES

Figure 1-1 Vicinity and Site Map 1-3
Figure 3-1 ERP Site OT001 Subareas 3-5
Figure 3-2 IRP Site LF002 Subareas 3-7
Figure 6-1 Site OT001 – 2014 Groundwater Sampling at Subarea PT1 6-3
Figure 6-2 Site LF002 – 2014 Groundwater Sampling at Subarea LF1 6-5

LIST OF APPENDICES

Appendix A Land Use Control Documentation
Appendix B Community Involvement Materials
Appendix C Five-Year Review Site Inspection Documentation
Appendix D 2014 Site Inspection Photographs
Appendix E Interview Records

LIST OF ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
1,2,3-TCP	1,2,3-trichloropropane
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AFCEC	Air Force Civil Engineer Center
AFS	Air Force Station
ARARs	applicable or relevant and appropriate requirements
ATV	all-terrain vehicle
CERCLA	Comprehensive Environmental Response, Compensation, & Liability Act of 1980
CFR	Code of Federal Regulations
COC	chemical or contaminant of concern
DRO	diesel range organics
ERP	Environmental Restoration Program
ESD	Explanation of Significant Difference
FYR	Five-Year Review
GRO	gasoline-range organics
ICs	institutional controls
IRP	Installation Restoration Program
Kalakaket	Kalakaket Creek
LF1	Landfill No. 1
LF2	Landfill No. 2
LTM	long-term monitoring
mg/kg	milligrams per kilogram
MWH	MWH Americas, Inc.
NCP	National Contingency Plan
O&M	operations and maintenance
PA	Preliminary Assessment
PAH	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
POL	Petroleum, Oil and Lubricant
PVC	polyvinyl chloride
RA	Remedial Action
RAO	remedial action objective
RI	Remedial Investigation
ROD	Record of Decision
RRO	residual-range organics
RRS	Radio Relay Station
SI	Site Inspection
SSI	Supplemental Site Inspection
TSCA	Toxic Substances Control Act
USAF	United States Air Force
USEPA	United States Environmental Protection Agency
VOCs	volatile organic compounds

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EXECUTIVE SUMMARY

This is the first Five Year Review (FYR) for Sites OT001 and LF002 at the Kalakaket Creek (Kalakaket) Radio Relay Station (RRS) near Galena, Alaska. The triggering action for this statutory review is initiation of the first long-term monitoring event at Site OT001 in September 2011. The FYR for Site LF002 is not required under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). However, the non-CERCLA remedy for petroleum hydrocarbons in soil and groundwater at Site LF002 included the submission of Performance Reports on institutional controls (ICs) every 5 years until cleanup is complete under Alaska State regulations. This FYR serves as the Performance Report on ICs for Site LF002.

The CERCLA chemicals or contaminants of concern (COCs) identified at OT001 are polychlorinated biphenyls (PCBs), the pesticide dieldrin, and 1,2,3-trichloropropane (1,2,3-TCP) in soil (USAF, 2009). Petroleum hydrocarbons, which are non-CERCLA COCs, were also identified as COCs in soil and groundwater at Site OT001. The selected remedy for Site OT001 under CERCLA is excavation and offsite disposal of PCB-, dieldrin-, and 1,2,3-TCP-impacted soil with concentrations above State of Alaska cleanup levels protective of unrestricted use. The selected remedies for Site OT001 under Alaska State laws are source removal and institutional controls (ICs) for petroleum contamination in soil at five subareas within Site OT001, and long-term monitoring (LTM) with ICs for petroleum hydrocarbon-impacted groundwater at one subarea within Site OT001. The Site OT001 remedy has been fully implemented. In September 2010, the Alaska Department of Environmental Conservation (ADEC) documented that Kalakaket RRS had achieved “Remedy in Place/ Remediation Complete,” and “site closure with ICs” was entered in the ADEC database for Kalakaket RRS.

No CERCLA COCs were identified at Site LF002. The non-CERCLA COCs identified at Site LF002 include gasoline-range organics (GRO) and diesel-range organics (DRO) in soil and DRO and residual-range organics (RRO) in groundwater. The remedies for LF002, selected pursuant to Alaska law, are ICs to restrict access to and limit exposure to and use of petroleum-contaminated subsurface soil at Site LF002 Subareas LF1 and LF2, and ICs and LTM for petroleum-contaminated groundwater at Subarea LF1.

There are no immediate threats from the sites, and the remedies are being implemented in accordance with the Record of Decision (ROD) and Decision Document for OT001 and with the Decision Document for LF002. The remedies for Sites OT001 and LF002 at Kalakaket RRS are currently protective of human health and the environment and comply with Federal and State requirements that are legally applicable or relevant and appropriate. The remedies for Sites OT001 and LF002 are also protective in the future.

Kalakaket RRS Site OT001 achieved a “Remedy in Place / Remediation Complete” designation under CERCLA from ADEC on 30 September 2010. “Site closure with ICs” was entered in the ADEC database for Site OT001 that same month.

The next statutory FYR at OT001 is scheduled to be completed by September 2021, 5 years after the completion of this FYR. If an FYR is conducted for Site LF002 to meet the IC Performance Report requirement of the remedy, the next FYR would also be completed by September 2021.

FIVE-YEAR REVIEW SUMMARY FORM

Site Identification		
Site name: Sites OT001 and LF002, Kalakaket Creek Radio Relay Station (RRS)		
CERCLIS ID Number: Not applicable		
Region: 10	State: AK	City/County: Kalakaket/Yukon-Koyukuk Borough
Site Status		
NPL status: <input type="checkbox"/> Final <input type="checkbox"/> Deleted <input checked="" type="checkbox"/> Other (specify): not listed in NPL		
Remediation status (choose all that apply): <input type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
Multiple OUs?* <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Construction completion date: 12 May 2010	
Has site been put into reuse? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
Review Status		
Lead agency: <input type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input checked="" type="checkbox"/> Other Federal Agency: US Air Force		
Author name: MWH Americas, Inc. on behalf of the Air Force Civil Engineer Center (AFCEC)		
Federal Project Manager: Charley Peyton, AFCEC Remedial Project Manager		
Author affiliation: Contractor		
Review period: 9 / 31 / 2011 to 9 / 1 / 2016		
Date(s) of site inspection: 12, 13, and 15 July 2014		
Type of review:		
<input type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input checked="" type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input checked="" type="checkbox"/> Regional Discretion		
Review number: <input checked="" type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify)		
Triggering action:		
<input type="checkbox"/> Actual RA Onsite Construction at OU #____ <input type="checkbox"/> Actual RA Start at OU#____ <input type="checkbox"/> Construction Completion <input type="checkbox"/> Previous Five-Year Review Report <input checked="" type="checkbox"/> Other (specify): September 2011 initiation of long-term monitoring at Site OT001		
Triggering action date (from WasteLAN): Not applicable		
Due date (five years after triggering action date): September 2016		

FIVE-YEAR REVIEW SUMMARY FORM (continued)

Issues/Recommendations				
A. Site OT001	Issue Category: Remedy Performance			
	Description: The ROD stated that PCB-contaminated soil would be disposed of offsite, but ADEC approved disposal of soil with PCB concentrations below 10 mg/kg in the Municipal Solid Waste Landfill constructed at Site OT001.			
	Recommendation: Prepare revised ROD by either an Explanation of Significant Difference (ESD) or ROD Amendment as appropriate to document this change to approved remedy.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
N	Y	AFCEC	ADEC	October 2017

Issues/Recommendations				
A. Site LF002	Issue Category: Remedy Performance			
	Description: Metal debris was previously observed protruding through the landfill liner.			
	Recommendation: Continue annual landfill inspections to monitor the integrity of the cap and make repairs, as needed.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
N	Y	AFCEC	ADEC	September 2016

Protectiveness Statement
There are no immediate threats from Sites OT001 or LF002 at Kalakaket RRS. The remedies for Sites OT001 and LF002 are currently protective of human health and the environment and comply with Federal and State requirements that are legally applicable or relevant and appropriate. The remedies for Sites OT001 and LF002 are also protective in the future.

1 INTRODUCTION

The purpose of a Five-Year Review (FYR) is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports. In addition, FYR reports identify any issues found during the review and provide recommendations to address them.

The U.S. Air Force (USAF) is preparing this FYR report pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) §121 and the National Contingency Plan (NCP). CERCLA §121 states:

“If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.”

The U.S. Environmental Protection Agency (EPA) interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) §300.430(f)(4)(ii) states:

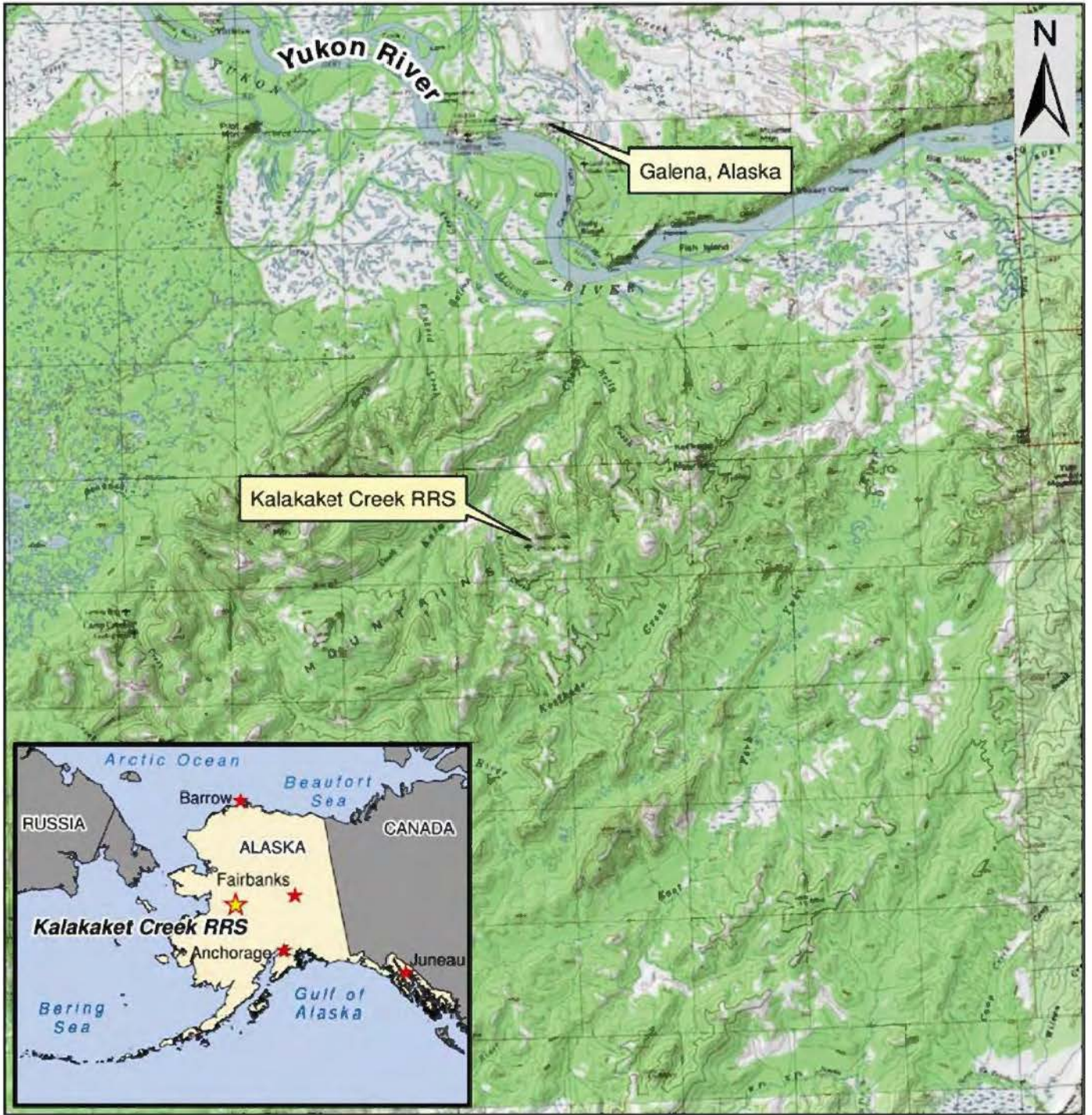
“If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.”

MWH Americas, Inc. (MWH) conducted the FYR of the remedies implemented at Installation Restoration Program (IRP) Site OT001 and IRP Site LF002, both located at the Kalakaket Creek (Kalakaket) Radio Relay Station (RRS), near Galena, Alaska (**Figure 1-1**). MWH performed this FYR on behalf of the Air Force Civil Engineer Center (AFCEC) under Contract Number FA8903-08-D-8777, Task Order 0158. This FYR was conducted for these sites at Kalakaket RRS from February 2014 through March 2016. This report documents the results of the review.

This report is the first FYR for Site OT001 at Kalakaket RRS. The triggering action for this statutory review is the initiation of the first long-term monitoring event at Site OT001 in September 2011. The statutory FYR is required due to the fact that hazardous substances, pollutants, or contaminants remain at OT001 above levels that allow for unlimited use and unrestricted exposure. The CERCLA chemicals or contaminants of concern (COCs) identified at OT001 are polychlorinated biphenyls (PCBs), the pesticide dieldrin, and 1,2,3-trichloropropane (1,2,3-TCP) in soil (USAF, 2009). Petroleum hydrocarbons, which are non-CERCLA COCs, were also identified as COCs in soil and groundwater at OT001.

The FYR for IRP Site LF002 is not required under CERCLA but is being performed to meet the institutional control (IC) Performance Report requirement of the Site LF002 remedy. No CERCLA COCs were identified at LF002. The non-CERCLA COCs identified at LF002 include

gasoline-range organics (GRO) and diesel-range organics (DRO) in soil, and DRO and residual-range organics (RRO) in groundwater.



FILE: D:\CAD\prod\AFCEC\Kalakaket Creek RRS\5-year review_10803721\main\Fig-1-1 Location and Vicinity Map.dgn

TIME: 30-MAR-2015 10:05

Source:

Kalakaket Creek Radio Relay Station, Alaska
 Kalakaket Creek RRS Groundwater Monitoring Report
 Figure 1 - Location of Kalakaket Creek RRS
 Project No.: 10-ECOS09-27, Date: November 2014



AFCEC
 KALAKAKET CREEK RRS, ALASKA
 FIVE YEAR REVIEWS

LOCATION AND VICINITY MAP

FIGURE
 1-1

10803721.68026401

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2 SITE CHRONOLOGY

The chronology of site events at Kalakaket RRS Sites OT001 and LF002 is presented in **Table 2-1**.

Table 2-1 Chronology of Site Events

Event	Date
The U.S. Air Force constructed Kalakaket RRS and operations were initiated.	1950s
Operations ceased and Kalakaket RRS was deactivated.	1973
Cleanup activities were performed at Kalakaket RRS.	1984
An initial Preliminary Assessment/Site Inspection (PA/SI) was conducted at Kalakaket RRS.	1994
Post-closure inspections were performed at LF002 Subareas Landfill 1 (LF2) and Landfill 2 (LF2).	2000
A Supplemental Site Inspection (SSI) and Remedial Investigation (RI) were conducted at Kalakaket RRS.	2007
The Proposed Plan for ERP Activities at the RRS was released for public comment and a public meeting was held.	May to July 2009
The Final Record of Decision (ROD), which identified the selected remedy for CERCLA chemicals of concern at Site OT001, was finalized and approved.	July 2009
ADEC issued solid waste permit number SW3A072-14 for the Class III Municipal Solid Waste Landfill constructed at Site OT001.	July 2009
A Clean Sweep action was performed at the RRS to remove buildings and unsafe debris and conduct environmental cleanup activities. This action included excavation and source removal activities at Site OT001.	September 2009
The Final Decision Document and ROD, which identified the selected remedy for IRP Site LF002, was finalized and approved.	February 2010
The Final Decision Document, which identified the selected remedy for petroleum contamination at Site OT001, was finalized and approved.	February 2010
The Clean Sweep Report on the 2009 action at Kalakaket RRS was finalized and approved by the Alaska Department of Environmental Conservation (ADEC).	May 2010
ADEC documented that Site OT001 had achieved “Remedy in Place/ Remediation Complete” under CERCLA, and “site closure with ICs” was entered in the ADEC database for Site OT001.	September 2010
Annual LTM and maintenance activities were performed at Sites OT001 and LF002.	September to October 2011
Annual LTM and maintenance activities were performed at Sites OT001 and LF002.	October 2012

Table 2-1 (Cont.) Chronology of Site Events

Event	Date
Annual LTM and maintenance activities were performed at Sites OT001 and LF002.	July 2013
Annual LTM and maintenance activities were performed at Sites OT001 and LF002.	July 2014

Key:

ADEC – Alaska Department of Environmental Conservation

CERCLA – Comprehensive Environmental Response, Compensation and Liability Act of 1980

ERP – Environmental Restoration Program

IC – institutional controls

IRP – Installation Restoration Program

LTM – long-term monitoring

ROD – Record of Decision

RRS – Radio Relay Station

3 BACKGROUND

3.1 Physical Characteristics

Kalakaket RRS is located near Kalakaket Creek in Alaska, approximately 20 miles south of Galena, 270 miles west of Fairbanks, and 310 miles northwest of Anchorage (Figure 1-1). The population of Galena, the closest community to Kalakaket RRS, was reported to be 610 in 2007 (USAF, 2009). The installation covers 302 acres on a low, relatively flat-topped mountain near the northern edge of the Yukon Kuskokwim uplands (USAF, 2009).

Kalakaket RRS is located on a mountain near the northern edge of the Yukon Kuskokwim uplands. To the south, the topography consists of low rolling mountains extending to the Kuskokwim River. To the north lies the broad Yukon River lowland. The Upper Camp Area of Kalakaket RRS is located on a plateau (flat top of the mountain), which drops away sharply in all directions. The Airstrip Area is located on a relatively flat shoulder of the mountain running east to west. The arm of the mountain gradually tapers off to the north, south, and eventually east into the adjacent river valleys (USAF, 2009).

Groundwater data for the Kalakaket RRS area is limited; however, shallow groundwater has been encountered within the silt- to cobble-sized overburden material overlying the bedrock, and within the limited fracture system of the bedrock at the site (USAF, 2010a). The presence of groundwater above bedrock appears to be seasonal, with groundwater present during periods of snowmelt and significant rainfall but absent during the winter and dry periods. Where groundwater is present, the shallow groundwater flow is thought to follow the bedrock topography. Most of the shallow groundwater at the summit plateau is interpreted to flow radially away from the hilltop. In the airstrip vicinity, groundwater flow is interpreted to travel to the northeast and southwest, generally following the topography that slopes away from the airstrip (USAF, 2010a).

3.2 Land and Resource Use

The Kalakaket RRS is located in a remote and mountainous area of west-central Alaska (Figure 1-1). The area surrounding the site is undeveloped and naturally pristine. Access by foot, all-terrain vehicle (ATV), or snowmobile is unrestricted (USAF, 2010a). The closest residents live near Galena, approximately 20 miles to the north. Small, non-residential cabins previously located 500 feet south of the airstrip were demolished in 2009 (USAF, 2010b). The land surrounding Kalakaket RRS is currently used for recreational purposes only (USAF, 2010b).

No water supply wells are known to exist in the vicinity of Kalakaket RRS. A water intake gallery was used as the water supply source for the installation. However, the intake gallery is not currently in working condition and may have been removed when its water pump house was demolished in 2009 (USAF, 2010b).

The closest surface water is a small and unnamed creek located approximately 4,000 feet east of Kalakaket RRS. The unnamed creek previously served as the source for the drinking water

intake gallery (USAF, 2010b). Kalakaket Creek is located approximately 2 miles west of the RRS. Both the unnamed creek and Kalakaket Creek flow north into Kala Creek, located about 3 miles northwest of Kalakaket RRS. Kala Creek flows northeastward toward the Yukon River and has a low gradient and a meandering course. Kala Creek enters the Yukon about 14 miles north-northeast of Kalakaket RRS (USAF, 2010a).

3.3 History of Contamination

Kalakaket RRS was a combined tropospheric scatter and microwave relay station initially constructed in the 1950s as part of the White Alice Communications System. The station provided links to North River RRS (Unalakleet) and Bear Creek RRS (Tanana) by using two pairs of 60-foot tropospheric scatter billboard antennas, and to Tatalina RRS (McGrath) by using a pair of 30-foot dish antennas. Communications between Campion Air Force Station (AFS), and later Galena AFS, were established by a microwave link. Kalakaket RRS operated continuously until 1973, when it was deactivated and replaced by a satellite communication system (USAF, 2010b).

The White Alice Site consisted of antennas, support buildings, two water tanks, and two fuel storage tanks on top of the mountain. A 4,000-foot-long airstrip is located 1 mile southwest of the mountain top, and is connected to the main station area by a gravel road. Past activities at Kalakaket RRS that may have potentially resulted in contaminant releases to the environment include the following (USAF, 2010b):

- Petroleum and chemical storage.
- Building and mechanical equipment maintenance.
- Use of transformers.
- Sewage disposal.
- Application of herbicides and pesticides.
- Burial and disposal of garbage and debris.

In 1984, the USAF performed cleanup activities at Kalakaket RRS (USAF, 2010a; 2010b). The cleanup consisted of the following activities:

- Burial of non-hazardous materials in two, one-time-use permitted landfills (Landfill 1 [LF1] and Landfill 2 [LF2]). Materials buried included: carbon dioxide fire extinguisher bottles; three empty and cleaned 1,000-gallon fuel tanks; two International Carryall trucks; one International pickup truck; one Ford cargo truck; two Oshkosh snowplow beds; old dump truck beds; and 3,250 cleaned, crushed, and empty 55-gallon drums.
- Testing containers for PCBs. PCB wastes were removed from Kalakaket RRS and disposed of in accordance with applicable regulations.
- Excavation and offsite disposal of soil with PCB concentrations greater than 50 milligrams per kilogram (mg/kg) (USAF, 2009). These excavations were performed at the area subsequently known as Site OT001, Subarea Equipment Building Transformer.

There are no operable units at Kalakaket RRS. As detailed in the RODs and Decision Documents for Kalakaket RRS (USAF, 2009; 2010a; 2010b), environmental investigations have been conducted at the installation since 1994. Kalakaket RRS has been investigated as two sites: OT001 and LF002. These sites are described below.

Site OT001 was divided into three geographic areas (Upper Camp Area, Airstrip Area, and Miscellaneous Area) and 16 investigation subareas (**Figure 3-1**). Ten of the OT001 investigation subareas were located in the Upper Camp, four subareas were located in the Airstrip Area, and the remaining two subareas were grouped under the Miscellaneous Area (USAF, 2010a).

Site LF002 is composed of two subareas (LF1 and LF2), each consisting of a closed landfill under a solid waste disposal permit (8631-BA008) issued by ADEC to the USAF as part of Kalakaket RRS deactivation cleanup activities (**Figure 3-2**). The landfills were used only once and were closed after cleanup activities were completed (USAF, 2010b).

In 1994, a Preliminary Assessment/Site Inspection (PA/SI) was conducted at Kalakaket RRS. The results of the PA/SI indicated that surface and subsurface soil at locations in five of the Site OT001 subareas were contaminated with COCs, including petroleum hydrocarbons, PCBs, and pesticides. CERCLA COCs were identified in soil at the following five OT001 subareas: Equipment Building, Equipment Building Transformer, Septic Tank Outfall, Airstrip Warehouse, and Drum Storage Area No. 2 (USAF, 2009). PCBs and petroleum hydrocarbons were also identified in sludge samples collected from a septic tank included in the Site OT001 subarea Septic Tank Outfall.

Non-CERCLA COCs (petroleum hydrocarbons) were present in the soil in the following five subareas of Site OT001 at concentrations above applicable State of Alaska Method 2 cleanup levels requiring remedial action: Drum Storage Area No. 2; Drum Storage Area No. 3; Petroleum, Oil, and Lubricant (POL) Tank No. 1; Vehicle Maintenance Garage; and Water Pump House (USAF, 2010a). Groundwater beneath subarea POL Tank No. 1 was also found to be contaminated with petroleum hydrocarbons above cleanup levels requiring remedial action (USAF, 2010a).

A 2007 Supplemental Site Inspection/Remedial Investigation (SSI/RI) further evaluated the nature and extent of contamination in surface soil, subsurface soil, and groundwater at Site OT001 (USAF, 2009), and determined that no CERCLA COCs were present in soil or groundwater at Site LF002 (USAF, 2010b). The report concluded that LF002 required no further action under CERCLA and no further remedial action under State of Alaska regulations (USAF, 2010b). However, petroleum contamination in LF1 soil and groundwater was documented. Petroleum hydrocarbons detected in soil at LF2 were at concentrations below ADEC Method 2 cleanup levels, and groundwater was not encountered beneath this landfill (USAF, 2010b).

Table 3-1 summarizes the COCs that have been identified at Site OT001 and the applicable cleanup levels identified for each COC. Complete lists of the applicable or relevant and appropriate requirements (ARARs) are included in the OT001 ROD (USAF, 2009) and Decision Document (USAF, 2010a).

Table 3-1 Summary of Site OT001 COCs and Applicable Cleanup Levels

COC	Maximum Concentration Detected)	Applicable Cleanup Level	Affected Subarea(s)
Soil			
1,2,3-TCP	1.5 mg/kg	0.17 mg/kg ^a	Aircraft Warehouse
Dieldrin	5.8 mg/kg	0.32 mg/kg ^a	Equipment Building Transformer and Septic Tank Outfall
DRO ^b	36,000 mg/kg	10,250 mg/kg ^a	Drum Storage Area 3 and Vehicle Maintenance Garage
DRO ^b	36,600 mg/kg	250 mg/kg ^c	Drum Storage Area 2; POL Tank No. 1; and Water Pump House
GRO ^b	460 mg/kg	300 mg/kg ^c	POL Tank No. 1
PCBs	6,824 mg/kg	1 mg/kg ^a	Aircraft Warehouse; Equipment Building; Equipment Building Transformer; Septic Tank Outfall; and Drum Storage Area 2
RRO ^b	138,000 mg/kg	10,000 mg/kg ^a	Drum Storage Area 3 and Vehicle Maintenance Garage
Groundwater			
DRO ^b	960 mg/L	1.5 mg/L ^a	POL Tank No. 1
RRO ^b	2.2 mg/L	1.1 mg/L ^a	POL Tank No. 1

Key:

1,2,3-TCP – 1,2,3-Trichloropropane

a – Cleanup levels were established in the Record of Decision (USAF, 2009) or the Decision Document (USAF, 2010a) and consist of 18 Alaska Administrative Code 75.341 Tables B1 & B2, Method Two Human Health cleanup levels for the under 40-inch zone for soil COCs and the 18 AAC 75.345 Table C groundwater cleanup levels for groundwater COCs.

b – These non-CERCLA contaminants are being addressed under State of Alaska laws and regulations.

c – Cleanup levels were established in the Decision Document (USAF, 2010a) and consist of ADEC Migration-to-Groundwater cleanup levels for soil COCs because the groundwater pathway is complete at these subareas.

ADEC – Alaska Department of Environmental Conservation

CERCLA – Comprehensive Environmental Response, Compensation and Liability Act of 1980

COC – chemical or contaminant of concern

DRO – Diesel-range organics

GRO – Gasoline-range organics

mg/kg – Milligrams per kilogram

mg/L – Milligrams per liter

PCBs – Polychlorinated biphenyls

POL – petroleum, oil, and lubricant

RRO – Residual-range organics



Upper Camp Subareas

- Antenna Feeder Horns (AFH)
- Antenna Fuel System (AFS)
- Drum Storage Area No. 1 (DS1)
- Equipment Building (EQB)
- Equipment Building Transformer (EQT)
- Fire Pump House (FPH)
- Paint Storage Building (PSB)
- POL Tanks No. 2 and No. 3 (P23)
- Septic Tank Outfall (STO)
- Vehicle Maintenance Garage (VMG)

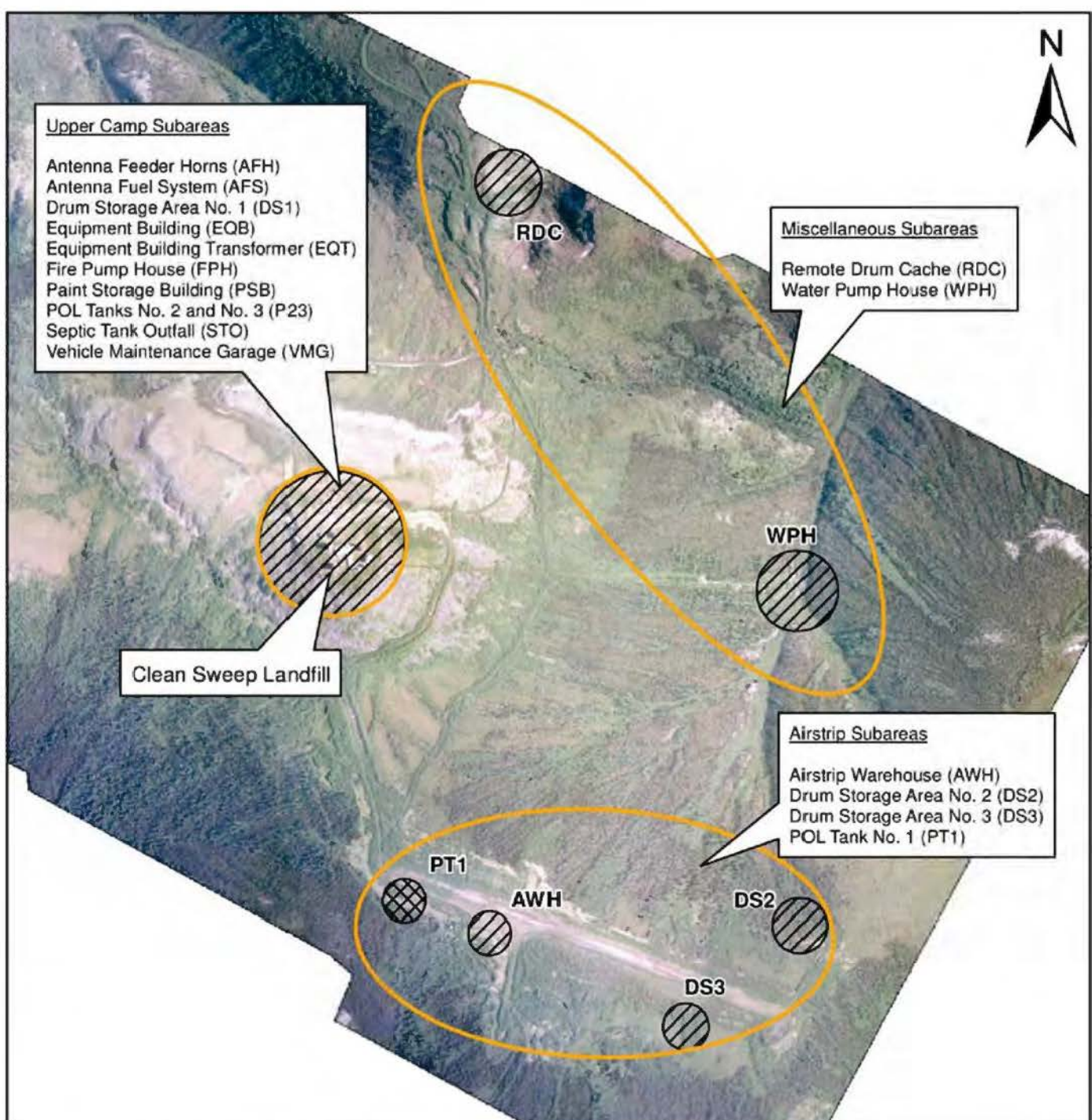
Miscellaneous Subareas

- Remote Drum Cache (RDC)
- Water Pump House (WPH)

Airstrip Subareas

- Airstrip Warehouse (AWH)
- Drum Storage Area No. 2 (DS2)
- Drum Storage Area No. 3 (DS3)
- POL Tank No. 1 (PT1)

Clean Sweep Landfill



LEGEND:

-  SOIL INSTITUTIONAL CONTROLS
-  SOIL AND GROUNDWATER INSTITUTIONAL CONTROLS
-  IRP SITE OT001 SUBAREAS

Source:
 Kalakaket Creek Radio Relay Station, Alaska
 Kalakaket Creek RRS, Groundwater Monitoring Report
 Figure 2 - Graphic Areas
 Project No.: 10-ECOS09-27, Date: November 2014



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 KALAKAKET CREEK RRS, ALASKA
 FIVE YEAR REVIEWS

ERP SITE OT001 SUBAREAS

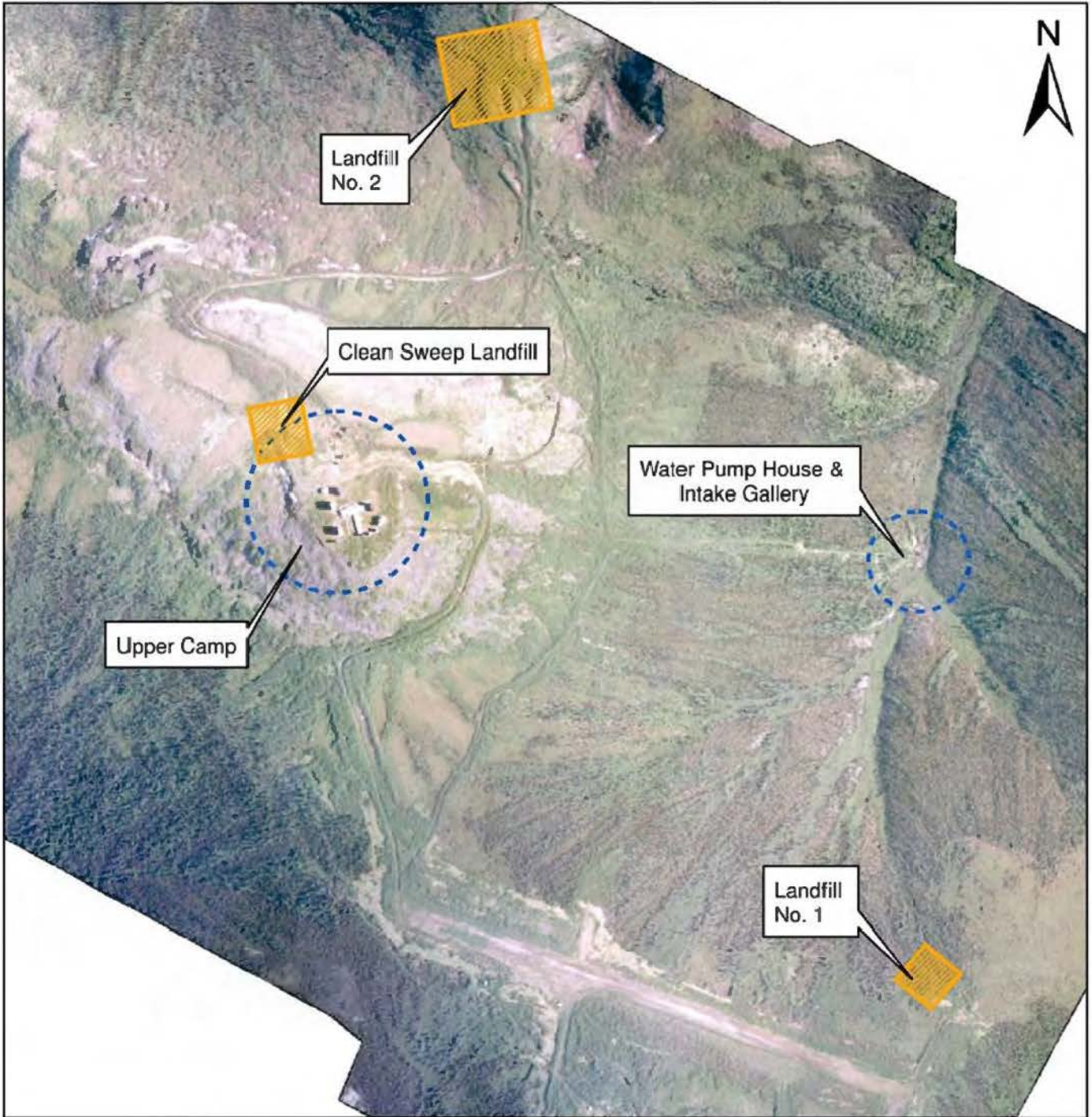
FIGURE
 3-1

FILE: D:\CAD\70\AFCEC\Kalakaket Creek RRS\5-year review_1003721\turnoff\figs-1 ERP Site OT001.dgn

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Source:

Kalakaket Creek Radio Relay Station, Alaska
 Kalakaket Creek RRS, Groundwater Monitoring Report
 Figure 3 - IRP Site LF002 Subareas
 Project No.: 10-ECOS09-27, Date: November 2014

LEGEND:

-  IRP SITE LF002 SUBAREAS AND LAND USE CONTROLS
-  SITE FEATURES



AFCEC
 KALAKAKET CREEK RRS, ALASKA
 FIVE YEAR REVIEWS

IRP SITE LF002 SUBAREAS

FIGURE
 3-2

10503721.58020401

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For Site LF002, the primary COC is DRO in soil and groundwater. The applicable soil cleanup level is the 18 Alaska Administrative Code (AAC) 75.341 Tables B1 & B2 Method Two Human Health cleanup level for the under 40 inch zone of 10,250 mg/kg. The applicable groundwater cleanup level is the 18 AAC 75.345 Table C groundwater cleanup level of 1.5 milligrams per liter (mg/L; USAF, 2010b). A complete list of the ARARs for LF002 is included in the Decision Document (USAF, 2010b).

3.4 Initial Response

There have not been any enforcement actions at Sites OT001 or LF002. Since 1984, the USAF has been conducting environmental cleanups and investigations at Kalakaket RRS. In May 2009, the Proposed Plan identifying the USAF's preferred remedies for Kalakaket RRS was made available to the public, starting the period for public comment.

3.5 Basis for Taking Action

Response actions at Site OT001 were determined to be necessary to protect the public health or welfare or the environment (USAF, 2009). The findings of the OT001 human health risk assessment indicated that action was required to protect human health as a result of exposure to CERCLA contaminants in soil at the site (USAF, 2009). In addition, past practices at Kalakaket RRS resulted in petroleum contamination in soil and/or groundwater at five subareas within OT001 and two subareas within LF002. Therefore, remedial action under State of Alaska regulations is required (USAF, 2010a and 2010b).

A response action was determined to be necessary at the Kalakaket RRS to protect public health or welfare or the environment from actual or threatened releases of hazardous substances to the environment and to meet cleanup standards established by the State of Alaska. The EPA has chosen to defer to ADEC for regulatory oversight of the CERCLA response activities at Kalakaket RRS.

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4 REMEDIAL ACTIONS

4.1 Remedy Selection

The selected remedies for the Kalakaket RRS were chosen in accordance with Alaska State laws and regulations and in accordance with CERCLA, as amended by the Superfund Amendment and Reauthorization Act of 1986 (SARA) and, to the extent practicable, the NCP, where applicable. The ROD and Decision Documents identified the USAF as the responsible party for administering and implementing the selected remedies (USAF, 2009; 2010a; 2010b).

4.1.1 Site OT001

Site OT001 was investigated as 16 subareas grouped into the following three larger, geographic areas: Upper Camp, Airstrip, and Miscellaneous. Five of the 16 subareas were identified as containing CERCLA hazardous substances in soil at concentrations above State of Alaska cleanup levels. The following five subareas within OT001 that require remedial action under CERCLA (USAF, 2009): Equipment Building, Equipment Building Transformer, Septic Tank Outfall, Airstrip Warehouse, and Drum Storage Area No. 2. In addition, the following five subareas within OT001 require remedial action under Alaska State laws and regulations due to petroleum hydrocarbon contamination (USAF, 2010a): Vehicle Maintenance Garage, Drum Storage Area No. 2, Drum Storage Area No. 3, POL Tank No. 1, and Water Pump House.

The ROD defined the remedial action objectives (RAOs) for the CERCLA subareas within Site OT001 as follows:

- Remedial actions will reduce the level of onsite contamination to concentrations at or below ADEC Method 2, Table B1 cleanup levels, which are 1.0 mg/kg for PCBs, 0.32 mg/kg for dieldrin, and 0.17 mg/kg for 1,2,3-TCP.
- Remedial actions will comply with the CERCLA Off-Site Rule (40 CFR 300.440).
- Remedial actions will result in remaining cumulative risk meeting two criteria:
 - 1) Cumulative carcinogenic risk standard of 1 in 100,000 across all exposure pathways is not exceeded.
 - 2) Cumulative non-carcinogenic risk standard at a hazard index (HI) of 1 across all exposure pathways is not exceeded.
- Remedial actions will maintain the integrity of wetlands areas by minimizing disruption of wetland vegetation and water flow features.

These RAOs were based on the assumed USAF goal of obtaining CERCLA site closure and, ultimately, transferring the Kalakaket RRS property to the U.S. Bureau of Land Management (USAF, 2009). No specific RAOs were identified for the non-CERCLA COCs at Site OT001 in the Decision Document (USAF, 2010a).

The ROD for Site OT001 was signed on 27 July 2009 (USAF, 2009) and the Decision Document for OT001 was signed on 24 May 2010 (USAF, 2010a). The decisions established by the ROD

and the Decision Document for OT001 were in accordance with, and in satisfaction of, the requirements of the Defense Environmental Restoration Program (DERP) and applicable State and Federal regulations.

Remedy under CERCLA

The selected remedy for Site OT001 under CERCLA is excavation and offsite disposal of PCB-, dieldrin-, and 1,2,3-TCP-impacted soil with concentrations above State of Alaska cleanup levels (18 AAC 75.341, Table B1) protective of unrestricted use (USAF, 2009). The major components of the OT001 remedy under CERCLA is the excavation and offsite transportation of the contaminated soil to a CERCLA-approved disposal site certified for the permanent disposal of solid Resource Conservation and Recovery Act (RCRA) hazardous, industrial, and Toxic Substances Control Act (TSCA) regulated wastes (USAF, 2009).

Remedy under Alaska State Regulations

The selected remedies for Site OT001, pursuant to Alaska law, are source removal and ICs for petroleum contamination in soil at five subareas within OT001, and long-term monitoring (LTM) with ICs for petroleum hydrocarbon-impacted groundwater at one subarea within OT001 (USAF, 2010a). The major components of the selected remedy for petroleum-contaminated soil at OT001 are as follows:

- Excavation of petroleum-contaminated surface soil with concentrations greater than ADEC Method 2 ingestion cleanup levels, which are 10,250 mg/kg for DRO; 10,000 mg/kg for RRO; and 1,400 mg/kg for GRO.
- Landspreading of the excavated soil from four subareas (Drum Storage Area No. 2; Drum Storage Area No. 3, POL Tank No. 1, and Water Pump House) to reduce the petroleum concentrations to below ADEC Method 2 ingestion cleanup levels, and reuse of the excavated soil as cover for the landfill construction in 2009 at Upper Camp.
- Offsite shipment of the excavated soil from the Vehicle Maintenance Garage subarea because of presence of lead above ADEC Method 2 cleanup level (400 mg/kg), co-located with petroleum-contaminated soil above ADEC Method 2 ingestion cleanup levels.
- Implementation of ICs to restrict access and limit exposure to and use of petroleum-contaminated soil at OT001, including restrictions on excavation or disturbance of petroleum-contaminated soil, placement of the soil in environmentally sensitive areas, and on movement of petroleum-contaminated soil without prior ADEC approval.

When cleanup levels are achieved in soil, ICs may be terminated with ADEC agreement (USAF, 2010a).

The major components of the selected remedy for petroleum-contaminated groundwater at Site OT001, Subarea POL Tank No. 1 are as follows:

- LTM of DRO- and RRO-contaminated groundwater to include the following:

- Annual sampling of groundwater monitoring wells at Subarea POL Tank No. 1 for volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), DRO, and RRO after implementation of the remedial action.
- Submission of an annual sampling report to ADEC containing the results of each groundwater sampling event compared to historical results.
- Implementation of ICs to restrict access and limit exposure to and use of petroleum-contaminated groundwater at OT001 and to prevent discharge and spread of petroleum contamination, including restrictions on excavation or drilling in areas containing petroleum-contaminated groundwater and requirements to follow applicable regulations to characterize and manage petroleum-contamination groundwater if it is used or removed from the site, pending prior approval from ADEC.

LTM will proceed until the groundwater contaminant plume is shown to be stable or shrinking, and contaminant concentrations are decreasing. When cleanup levels are achieved in the groundwater, ICs may be terminated with ADEC agreement (USAF, 2010a).

4.1.2 Site LF002

Site LF002 was investigated as two subareas: LF1 and LF2. Petroleum contamination was documented in soil and groundwater along the perimeter of the LF1 subarea at concentrations above State of Alaska cleanup levels. The investigation of the perimeter of the LF2 subarea did not detect contaminant concentrations in soil above the most stringent State of Alaska Method 2 cleanup levels, nor was groundwater encountered, but there still remains the potential of contamination emanating from LF2 (USAF, 2010b).

Remedy under CERCLA

A combined Decision Document and ROD were prepared to identify appropriate remedies for Site LF002 (USAF, 2010b). The selected remedy for LF002 is no further action under CERCLA, because the only COCs identified were petroleum hydrocarbons, which are excluded as CERCLA hazardous substances (USAF, 2010b). The ROD concluded that petroleum contamination identified at LF002 would be addressed under State of Alaska regulations; however, the USAF chose to follow a CERCLA process to evaluate and make decisions regarding LF002 (USAF, 2010b). Implementation of the selected remedies will result in LF002 being acceptable for “Cleanup Complete with ICs,” subject to remaining landfill permit restrictions.

Remedy under Alaska State Regulations

The remedies for LF002, selected pursuant to Alaska law, are ICs to restrict access to and limit exposure to, and use of, petroleum-contaminated subsurface soil at LF1 and LF2, and ICs and LTM for petroleum-contaminated groundwater at LF1. ICs were designed to provide additional protection against potential future exposure to unknown contamination emanating from the landfill. Under their existing landfill permit, LF1 and LF2 are also still subject to the requirements of 18 AAC 60, which addresses inherent risks associated with landfills, as long as buried waste remains onsite (USAF, 2010b).

Although the contaminated soil is beneath a landfill cap, ICs for soil will protect against exposure and placement of the contaminated soil in environmentally sensitive areas. Since access to the site is extremely difficult and future land use would be restricted by ICs, this remedy ensures ongoing protectiveness (USAF, 2010b).

Implementing groundwater ICs will protect against exposure and use of the contaminated groundwater. The ICs would allow the contaminated groundwater to naturally attenuate, and LTM would verify that the groundwater contaminant plume is stable or shrinking and that contaminant concentrations in the groundwater are decreasing. Because the petroleum contamination is expected to be degrading, access to the site is extremely difficult and future land use would be restricted by ICs, this alternative ensures ongoing protectiveness (USAF, 2010b). The remedy also includes submittal of a Performance Report on ICs at LF002 to ADEC once every 5 years.

4.2 Remedy Implementation

In 2009, a Clean Sweep action was performed at the Kalakaket RRS to remove buildings and unsafe debris from the inactive facility. The Clean Sweep activities included a remedial action, (RA; described below) and the following: abatement of deactivated buildings and associated infrastructure; demolition of all buildings and infrastructure; and construction of an onsite landfill, designed and closed to meet ADEC permit requirements for an inert monofill under 18 AAC 60, for onsite disposal of excavated soil (USAF, 2010c).

The RA at Kalakaket RRS was performed in September 2009 and included the excavation and source removal remedies specified for Site OT001 in the ROD (USAF, 2009) and Decision Document (USAF, 2010a). The RA consisted of the following activities, as documented in the Clean Sweep Report (USAF, 2010c):

- Soil with PCB concentrations greater than 1 mg/kg but less than 10 mg/kg was excavated and placed in the Municipal Solid Waste Landfill constructed at Site OT001. Soil with PCB concentrations greater than 10 mg/kg PCBs was shipped offsite for disposal.
- Soil with DRO and RRO concentrations exceeding 10,250 mg/kg and 10,000 mg/kg, respectively, was land spread. Once ADEC cleanup criteria were met through volatilization of POL-contaminants, the soil was used as cover material for the new onsite Municipal Solid Waste Landfill.
- Soil with historical 1,2,3-TCP detections was placed on a concrete pad to allow the VOCs to volatilize. After VOC concentrations were documented to be below ADEC cleanup standards, the soil was transported to the onsite Municipal Solid Waste Landfill and used as cover material.
- Soil at the Site OT001 Vehicle Maintenance Garage subarea with lead above the ADEC Method 2 cleanup level (400 mg/kg), co-located with petroleum-contaminated soil above ADEC Method 2 ingestion cleanup levels, was excavated and shipped offsite for disposal.

The ROD stated that PCB-contaminated soil would be disposed of offsite. However, the quantity of soil excavated substantially exceeded the estimates. The permit for the newly-created Municipal Solid Waste landfill allowed for disposal of soil with low-level PCB concentrations, so ADEC approved onsite disposal of soil with PCB concentrations between 1 mg/kg and 10 mg/kg (USAF, 2010c). ADEC approved the Final Clean Sweep Report on 12 May 2010, indicating that Kalakaket RRS had obtained “remediation complete” status. On 30 September 2010, Site OT001 achieved a “Remedy in Place / Remediation Complete” designation under CERCLA from ADEC. “Site closure with ICs” was entered in the ADEC database for Site OT001 that same month.

The remedies for Sites OT001 and LF002 also include ICs to limit exposures to contaminated soil and groundwater at Kalakaket RRS. In December 2012, the USAF issued the *Land Use Control Management Plan* (USAF, 2012a) for the 611th Air Support Group Installations, which includes Kalakaket RRS. The Management Plan identified that there are LUCs in effect at Sites OT001 and LF002 at Kalakaket RRS (USAF, 2012a). A copy of the LUC boundary figure from the Management Plan is provided in **Appendix A**. Also included in Appendix A is a copy of the relevant page of Management Plan Table 2-1, which describes the LUCs that are in effect at these two sites (USAF, 2012a). This FYR serves as the required Performance Report on the ICs in place at Site LF002.

4.3 System Operation/Operations and Maintenance

Maintenance activities were specified in the Decision Document for Site LF002 (USAF, 2010b) regarding maintaining the landfill cover and preventing run-on and run-off from the landfill. There were no operations and maintenance (O&M) activities identified for Site OT001 in the ROD or Decision Document (USAF, 2009; 2010a). However, the annual groundwater monitoring specified in the Kalakaket RRS ROD and Decision Documents could also be considered O&M. In addition, there may be State requirements under 18 AAC 60 related to the Class III Municipal Solid Waste landfill at Site OT001 that are outside the scope of this FYR. The annual LTM and maintenance activities that are conducted at Sites OT001 and LF002 at Kalakaket RRS include the following:

- Sample groundwater monitoring wells at Site OT001 Subarea POL Tank No. 1 for DRO, RRO, VOCs, and PAHs.
- Sample groundwater monitoring wells at Site LF002 Subarea LF1 for GRO, DRO, RRO, VOCs, and PAHs.
- Visually monitor the top cover at Site LF002 Subareas LF1 and LF2 for signs of settlement, subsidence, erosion, or other such events.

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5 PROGRESS SINCE THE LAST REVIEW

This is the first FYR for OT001 and LF002 at Kalakaket RRS.

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6 FIVE-YEAR REVIEW PROCESS

6.1 Administrative Components

The Kalakaket RRS FYR team was led by Mr. Charley Peyton, AFCEC Remedial Project Manager, and included AFCEC, MWH, BEM-Bay West, and ADEC staff with expertise in site investigation and remediation.

The review team established the FYR schedule, which included the following components:

- Community Involvement
- Document Review
- Data Review
- Site Inspection
- Local Interviews
- FYR Report Development and Review

These components are discussed below. The schedule extended through March 2016.

6.2 Community Involvement

Activities to involve the community in the FYR were initiated with a notice published in the local newspaper (*Fairbanks Daily News-Miner*) on 31 August 2014 (**Appendix B**). Members of the community were invited to submit any issues or concerns regarding the Kalakaket RRS cleanup program to Mr. Charley Peyton, the AFCEC Remedial Project Manager, by 15 October 2014. However, no responses were received from members of the community.

6.3 Document Review

This FYR consisted of a review of relevant documents, including LTM groundwater data, maintenance reports, and the *Land Use Control Management Plan* (USAF, 2012a). The ROD (USAF, 2010b) served as the source document for the RAOs for Site OT001. In addition, the following documents and records were reviewed:

- *Final Technical Project Report, 2011 Environmental Long Term Monitoring and Maintenance, Kalakaket Creek Radio Relay Station* (USAF, 2012b)
- *Final Technical Project Report, 2012 Environmental Long Term Monitoring and Maintenance, Kalakaket Creek Radio Relay Station* (USAF, 2013)
- *Final Technical Project Report, 2013 Environmental Long Term Monitoring and Maintenance, Kalakaket Creek Radio Relay Station* (USAF, 2014)
- *Final Technical Project Report, 2014 Environmental Long Term Maintenance, Kalakaket Creek Radio Relay Station* (USAF, 2015)

6.4 Data Review

Groundwater data from the 2011, 2012, 2013, and 2014 monitoring events were reviewed as part of the FYR. The results of the groundwater monitoring at Sites OT001 and LF002, and the post-closure field inspections performed at Kalakaket RRS, were reviewed as part of the FYR. The groundwater results for OT001 and LF002 and the issues identified at each subarea, as detailed in the annual Technical Project Reports (USAF, 2012b; 2013, 2014; 2015), are summarized below.

6.4.1 Site OT001 Groundwater Data and Field Inspections

There are five monitoring wells at Site OT001 (**Figure 6-1**), and the groundwater samples from these wells are analyzed for VOCs, PAHs, DRO, and RRO. Groundwater recharge at OT001 varied from year to year, with anywhere from one to three wells exhibiting very slow recharge that made it difficult to purge, monitor the water quality parameters for stabilization, and sample (USAF, 2015).

VOCs and PAHs have been detected in groundwater at Site OT001 Subarea POL Tank No. 1 during each monitoring event, but the detected concentrations have been below the ADEC groundwater cleanup levels each year. DRO and RRO have also been detected during each round of groundwater sampling at Subarea POL Tank No. 1. In 2011, 2012, and 2013, DRO and RRO concentrations in groundwater at OT001 exceeded their respective ADEC groundwater cleanup levels of 1,500 and 1,100 micrograms per liter ($\mu\text{g/L}$), respectively. However, in 2014, DRO and RRO were detected at maximum concentrations of 1,100 and 120 $\mu\text{g/L}$, respectively, which are below their ADEC groundwater cleanup levels (Figure 6-1). These results suggest that DRO and RRO are attenuating naturally in Site OT001 groundwater (USAF, 2015).

The 2012 and 2013 field inspections noted damage to two Site OT001 monitoring wells: PT1SB04 and PT1SB15 (USAF, 2013; 2014). The wells were reportedly leaning at approximately 45 degree angles from the ground surface due to frost jacking. In July 2014, the protective polyvinyl chloride (PVC) well casings at Wells PT1SB04 and PT1SB15 were removed just below the ground surface and replaced with new, 4-inch inner diameter section A53 American Society for Testing and Materials (ASTM)-rated steel, which is structurally stronger and conditioned for applications under pressure to better withstand frost jacking during winter months (USAF, 2015). Missing well caps from Wells PT1SB01 and PT1SB09 were also replaced to properly secure the wells (USAF, 2015).

6.4.2 Site LF002 Groundwater Data and Field Inspections

There are four monitoring wells at Site LF002 (**Figure 6-2**), and the groundwater samples from these wells are typically analyzed for VOCs, PAHs, GRO, DRO, and RRO. Groundwater monitoring was not performed at LF002 Subarea LF1 in 2011 due to inclement weather (USAF, 2012b).



LEGEND:

- OIL SHEEN (2014)
- APPROXIMATE WELL LOCATION SAMPLE RESULTS BELOW 18 AAC 75 TABLE C (DRO<1,500 ug/L) (2014)
- APPROXIMATE HYDRANT LOCATION
- GROUNDWATER FLOW DIRECTION
- FUEL LINE
- POL TANK 1

Source:

Kalakaket Creek Radio Relay Station, Alaska
 Kalakaket Creek RRS, Groundwater Monitoring Report
 Figure 5 - OT001, Subarea PT1 Groudwater Sampling
 Project No.: 10-ECOS09-27, Date: November 2014



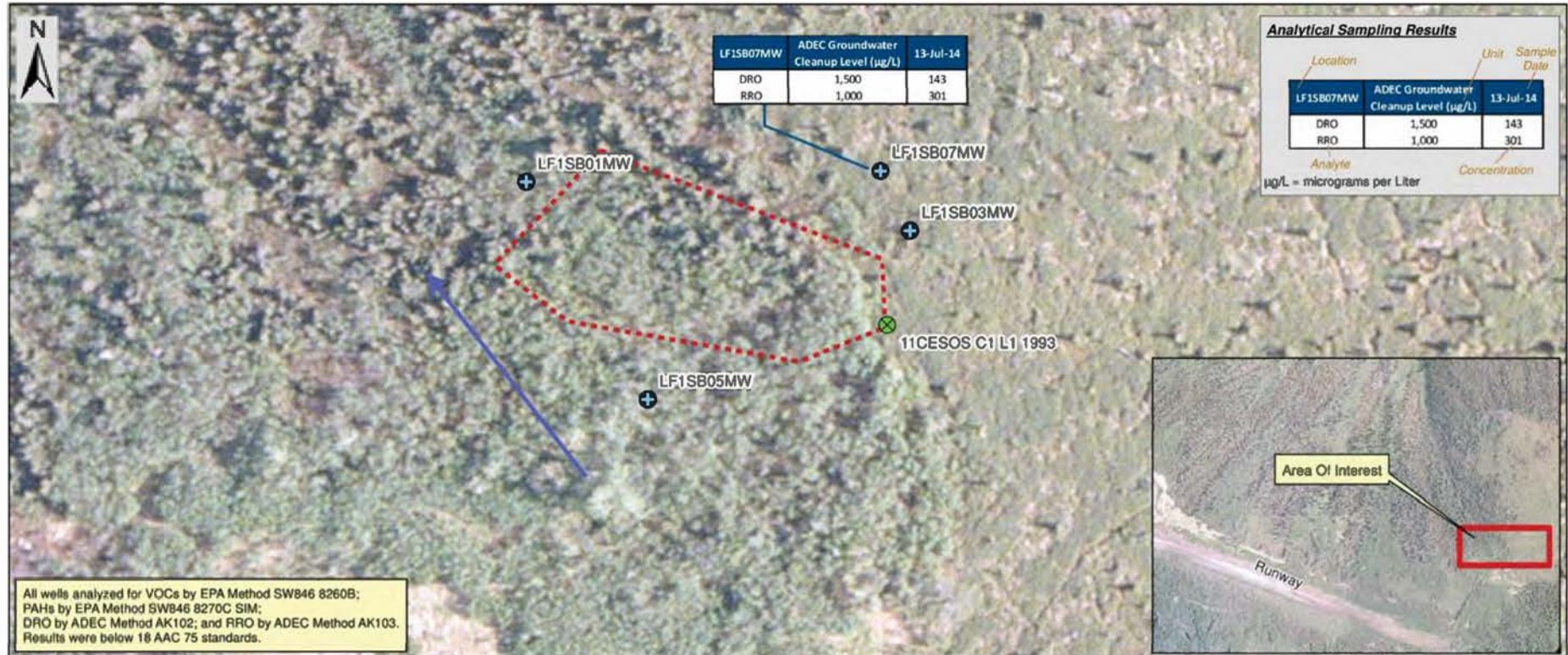
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 FIVE YEAR REVIEWS

SITE OT001
 2014 GROUNDWATER SAMPLING AT SUBAREA PT1





FIGURE

6-1

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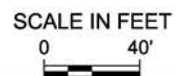


LEGEND:

-  APPROXIMATE WELL LOCATION
-  SURVEY MARKER
-  GROUNDWATER FLOW DIRECTION
-  LF002, SUBAREA LF1

Source:

Kalakaket Creek Radio Relay Station, Alaska
 Kalakaket Creek RRS, Groundwater Monitoring Report
 Figure 6 - LF002, Subarea LF1 Groundwater Sampling
 Project No.: 10-ECOS09-27, Date: November 2014



AFCEC
 KALAKAKET CREEK RRS, ALASKA
 FIVE YEAR REVIEWS

SITE LF002
 2014 GROUNDWATER SAMPLING AT SUBAREA LF1

FIGURE

6-2

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In 2013, three of the four wells at LF1 contained insufficient volumes of groundwater for the field team to collect samples, and the amber bottles containing the groundwater samples from the fourth well (LF1SB07MW) broke during shipment to the laboratory. Therefore, there was insufficient sample volume to analyze the LF1 groundwater sample for DRO and RRO in 2013 (USAF, 2014). In 2014, two wells at LF1 contained insufficient volumes of groundwater for the field team to collect complete samples, so only vials for VOC and GRO analyses were collected (USAF, 2015). A third well at Site LF002 contained insufficient groundwater for the field team to collect any samples in 2014, leaving only one well at LF1 with adequate groundwater for complete analysis. In 2012 and 2014, all analytes detected in LF1 groundwater were at concentrations substantially below their respective ADEC groundwater cleanup levels (Figure 6-2 – USAF, 2013; 2015).

The field inspections did not identify any damage to the wells at LF002 Subarea LF1. However, in 2013, it was noted that the recharge rates at LF1 varied annually due to seasonal variability and fractured bedrock in the area, and overall repair or abandonment and replacement was recommended for the four LF1 wells (USAF, 2014). In 2014, a well cap that was missing from one LF002 well was replaced with a 1-inch diameter PVC cap (USAF, 2015).

The annual fieldwork included visual inspections of the Site LF002 Subareas LF1 and LF2 to monitor for signs of settlement, subsidence, erosion, or other changes, as well as to note any observed evidence of trespass or site usage inconsistent with the LF002 Decision Document (USAF, 2010b). The annual field inspections identified the following at Site LF002:

- In 2011, ponded water was observed along the southwestern edge of LF002 Subarea LF1. No sheen was evident on the ponded water in 2011, and ponded water was not observed at LF1 during subsequent field inspections (USAF, 2012b; 2013; 2014; 2015).
- Minor debris was noted on top of LF1, along the southwestern edge of the subarea, in 2011 (USAF, 2012b) and minor exposed metal debris was noted along the western end of LF1 in 2012 (USAF, 2013). However, no metal debris was noted at LF1 during the 2013 or 2014 field inspections (USAF, 2014; 2015).
- In 2012 and 2013, minor settling was observed in the center of the LF2 top cover. Approximately 6-inches of frozen, ponded water was present in the depression during these inspections (USAF, 2013; 2014). However, neither signs of settlement or ponded water was observed in 2014 (USAF, 2015).

6.5 Site Inspection

Site inspections were performed at Sites OT001 and LF002 on 12, 13, and 15 July 2014 as part of the annual groundwater monitoring and maintenance work at Kalakaket RRS. Details of the site inspection were included in the Final Technical Project Report on the 2014 Environmental Long Term Maintenance (USAF, 2015). The visual inspection checklists for LF002 and photo documentation for OT001 and LF002 from the 2014 report are provided in **Appendix C** and **Appendix D**, respectively.

The results of the Kalakaket RRS site inspections identified no indications of a change in land use in the area, residential construction at the installation, or evidence of excavation or drilling (USAF, 2015). A small (less than 3-foot diameter) oil stain was observed on the west end of the airstrip. The stain appeared relatively unweathered, so it was assumed that it occurred during the 2013 site inspection (USAF, 2015). There were no significant concerns identified at Kalakaket RRS during the site inspections.

6.6 Local Interviews

Interviews were conducted with various parties connected to Kalakaket RRS. The Kalakaket RRS does not have a facility manager, because it is an inactive site. Therefore, interviews were conducted with the following parties on the dates indicated below:

- Mr. Charley Peyton, AFCEC Remedial Project Manager – 9 January 2015; and
- Mr. Dennis Shepard, Project Manager for ADEC – 17 February 2015.

The interview questions and interview record forms are included in **Appendix E**. A summary of the interview results is provided below.

Mr. Peyton and Mr. Shepard both agreed that the remedies at Sites OT001 and LF002 are functioning as intended, and neither is aware of any community concerns regarding, or incidents at, Kalakaket RRS. Mr. Peyton indicated that slow groundwater recharge makes LTM difficult. Mr. Shepard also noted that low recovery in the wells is a problem and stated that a few of the wells have not been sampled to date. Mr. Peyton said that he has recommended to ADEC that groundwater monitoring be performed at Kalakaket RRS every 5 years instead of on an annual basis.

Mr. Shepard noted that the solid waste plan for Kalakaket RRS has lapsed, but that AFCEC and ADEC are working on the renewal. He does not expect that there will be any problems with the renewal for Kalakaket RRS. Mr. Shepard stated that LTM reports noted ATV tracks and a few small oil stains on the landfill at Kalakaket RRS.

7 TECHNICAL ASSESSMENT

7.1 Technical Assessment Questions

7.1.1 Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, groundwater data, and the results of the site inspections indicates that the remedy is functioning as intended by the ROD and Decision Documents for Site OT001 (USAF, 2009; 2010a) and Site LF002 (2010b). The source removal and excavation portions of the remedies have been implemented and the Kalakaket RRS is identified by ADEC as having achieved “site closure with ICs.” The Site OT001 remedy specified offsite disposal of PCB-contaminated soil. However, ADEC approved onsite disposal of soil with low-level PCB concentrations in a monofill constructed at Site OT001. The change to the approved Site OT001 remedy should be documented in an Explanation of Significant Difference (ESD) or ROD Amendment.

LTM indicates that concentrations of groundwater COCs no longer exceed ADEC cleanup standards at OT001, and remain below ADEC cleanup standards at LF002 (USAF, 2015).

The ICs have achieved the RAO to limit exposures to petroleum-contaminated soil and groundwater at Kalakaket RRS and will remain in place until soil and groundwater concentrations of petroleum hydrocarbons are below the ADEC Method Two Migration to Groundwater soil and groundwater cleanup levels, respectively. There are no issues that would place the protectiveness of the remedy at risk.

An evaluation of the condition of the Sites OT001 and LF002 wells should be performed as a potential opportunity for system optimization. Slow groundwater recharge has affected the groundwater monitoring program, and an evaluation is recommended to determine if repair or abandonment and replacement of the wells is warranted.

7.1.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?

The exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time the remedies for Kalakaket RRS were selected are still valid. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy.

Changes in Standards

There have been no changes to the ARARs for Kalakaket RRS and there are no new standards affecting the protectiveness of the remedy.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

There are no changes to the exposure pathways at Kalakaket RRS. In addition, there have been no changes in the toxicity factors for the Kalakaket RRS COCs. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedies.

7.1.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Metal debris was observed protruding through the liner at Site LF002. Ongoing inspections to evaluate the integrity of the cap and conduct required repairs are necessary to ensure that the remedy remains protective. No additional information has been identified that calls into question the protectiveness of the Site OT001 or LF002 remedies.

7.2 Technical Assessment Summary

Based on the data reviewed, the site inspection, and the interviews, the remedy is functioning as intended by the ROD and Decision Documents. The source removal and excavation portions of the remedy have been implemented at Kalakaket RRS and “site closure with ICs” status has been achieved. However, an ESD or ROD Amendment are required to document State-approved changes to the Site OT001 remedy. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no changes in the toxicity factors for the site COCs, and there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There have been no other changes in the exposure assumptions and no new contaminants have been identified at the site. Ongoing inspections to evaluate the integrity of the LF002 cap and conduct required repairs are necessary to ensure that the remedy remains protective. There is no other information that calls into question the protectiveness of the remedy.

8 ISSUES

Table 8-1 summarizes the issues related to site conditions or activities at Kalakaket RRS. Two issues were identified that may affect the future protectiveness of the remedies at Sites OT001 and LF002.

Table 8-1 Issues Associated with Site Conditions or Activities

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
The ROD stated that PCB-contaminated soil would be disposed of offsite, but ADEC approved disposal of soil with PCB concentrations below 10 mg/kg in the Municipal Solid Waste Landfill constructed at Site OT001.	N	Y
Metal debris was previously observed protruding through the landfill liner.	N	Y

Key:

ADEC – Alaska Department of Environmental Conservation

N – No

PCB – polychlorinated biphenyl

ROD – Record of Decision

Y – Yes

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9 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Table 9-1 summarizes the recommended improvements or follow-up actions for Kalakaket Creek RRS.

Table 9-1 Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Groundwater recharge rates are very slow at Sites OT001 and LF002.	Evaluate the condition of Sites OT001 and LF002 wells and determine if repair or abandonment and replacement are necessary.	AFCEC	ADEC	2017	N	N
An oil stain was observed on west end of the airstrip.	Collect two soil grab samples for GRO, DRO, and RRO analyses to assess potential petroleum contamination.	AFCEC	ADEC	2016	N	N
The ROD stated that PCB-contaminated soil would be disposed of offsite, but ADEC approved disposal of soil with PCB concentrations below 10 mg/kg in the Municipal Solid Waste Landfill constructed at Site OT001.	Prepare an ESD or ROD Amendment as appropriate to document the change to approved remedy.	AFCEC	ADEC	2017	N	Y
ATV tracks were noted on the landfill (trespassing).	Continue periodic inspections to monitor for signs of trespassing, and determine if additional actions (signs, fencing) are warranted.	AFCEC	ADEC	2016	N	N

Table 9-1 (Cont.) Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
<u>The USAF is currently preparing a deed restriction for Site OT001.</u>	<u>Record the deed restriction for Site OT001.</u>	<u>AFCEC</u>	<u>ADEC</u>	<u>2016</u>	<u>N</u>	<u>N</u>
Metal debris was previously observed protruding through the landfill liner.	Continue annual landfill inspections to monitor the integrity of the cap and make repairs, as needed.	AFCEC	ADEC	2016	N	Y

Key:

ADEC – Alaska Department of Environmental Conservation

AFCEC – Air Force Civil Engineer Center

ATV – all-terrain vehicle

DRO – diesel range organics

GRO – gasoline range organics

N – No

RRO – residual range organics

Y – Yes

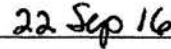
10 PROTECTIVENESS STATEMENT

There are no immediate threats from ERP Site OT001 and IRP Site LF002 at Kalakaket RRS. The remedies for Sites OT001 and LF002 are currently protective of human health and the environment and comply with Federal and State requirements that are legally applicable or relevant and appropriate. The remedies for Sites OT001 and LF002 are also protective in the future.

The USAF certifies that the remedies for Sites OT001 and LF002 at Kalakaket RRS are protective of human health and the environment and comply with Federal and State requirements that are legally applicable or relevant and appropriate.



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



Date

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11 NEXT REVIEW

The next statutory FYR for Site OT001 is scheduled to be completed by September 2021, 5 years after the completion of this FYR. If an FYR is conducted for Site LF002 to meet the Performance Report requirement of the remedy, the next FYR would also be completed by September 2021.

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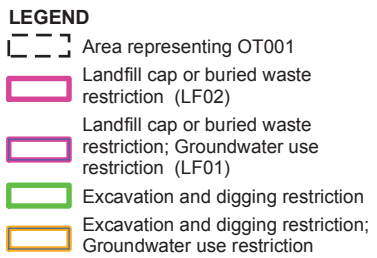
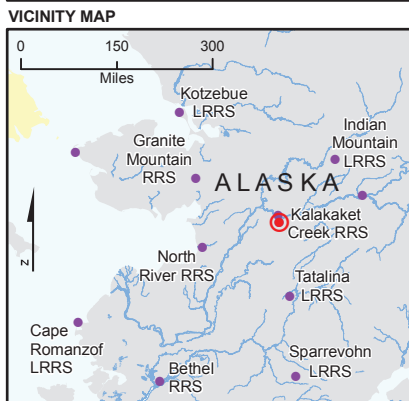
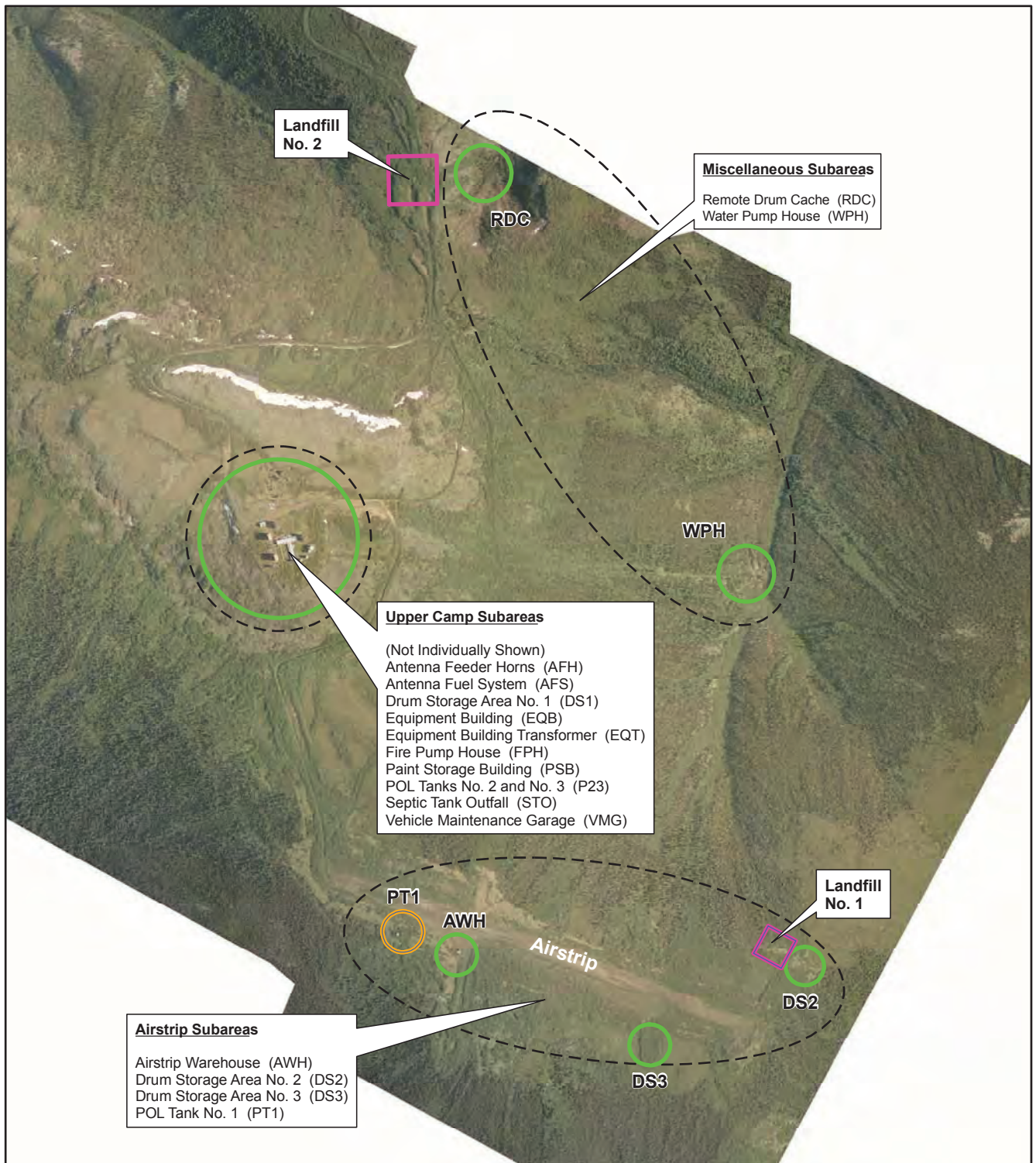
12 REFERENCES

- U.S. Air Force (USAF). 2009. Final Record of Decision, IRP Site OT001/White Alice Site, Kalakaket Creek Radio Relay Station, Alaska. July.
- USAF. 2010a. Final Decision Document – Petroleum Contamination IRP Site OT001/White Alice Site, Kalakaket Creek Radio Relay Station, Alaska. February.
- USAF. 2010b. Final Decision Document and CERCLA Record of Decision, IRP Site LF002 – Landfills, Kalakaket Creek Radio Relay Station, Alaska. February.
- USAF, 2010c. Final Report, Kalakaket Clean Sweep 2009, Building Demolition, Debris Removal, Landfill Construction and Environmental Remediation, Kalakaket Creek Radio Relay Station, Alaska. May.
- USAF. 2012a. Land Use Control Management Plan 2012, United States Air Force, Joint Base Elmendorf-Richardson, Alaska. December.
- USAF. 2012b. Final Technical Project Report, 2011 Environmental Long Term Monitoring and Maintenance, Kalakaket Creek Radio Relay Station. August.
- USAF. 2013. Final Technical Project Report, 2012 Environmental Long Term Monitoring and Maintenance, Kalakaket Creek Radio Relay Station. March.
- USAF. 2014. Final Technical Project Report, 2013 Environmental Long Term Monitoring and Maintenance, Kalakaket Creek Radio Relay Station. February.
- USAF, 2015. Final 2014 Technical Project Report for the 2014 Environmental Long Term Management, Kalakaket Creek Radio Relay Station. January.

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APPENDIX A

Land Use Control Documentation



- Notes:
1. RRS = Radio Relay Station.
 2. LUC = Land Use Control. LUC boundaries depicted on this figure are preliminary pending final analysis of survey information. LUC boundaries will be updated once this information is available.
 3. There is no 611th GeoBase data for Kalakaket RRS. Map features established during a 2007 study.
 4. Data are rendered in UTM Zone 4N, WGS84, Meters.

FIGURE 2-14
Kalakaket RRS
LUC Boundaries
Land Use Control Management Plan
For Multiple 611 ASG Installations
Joint Base Elmendorf – Richardson, Alaska

TABLE 2-1

Description of LUC Types Currently in Effect at 611 CES/CEAR ERP Sites
 Land Use Control Management Plan 2012 for 611 ASG Installations, JBER, Alaska

Installation: IRP Site(s) with LUCs in Effect ¹	Purpose and Objectives	Prohibitions/Restrictions	Engineered Elements	Expected Durations	Monitoring/ Inspections/ Reporting/ Maintenance	Administrative Elements
Kalakaket: LF002 (includes LF1 and LF2)	<ul style="list-style-type: none"> Restrict access and limit exposure to and use of the petroleum-contaminated subsurface soil at LF001 and protect against potential future exposure to unknown contamination emanating from LF002 	<ul style="list-style-type: none"> No unauthorized excavation or disturbance of the final top cover at LF1 and LF2 No construction on top of LF1 or LF2 without ADEC concurrence No unauthorized excavation or disturbance of contaminated soil to prevent further groundwater contamination or placement of contaminated soil in environmentally sensitive areas No movement of contaminated soil without ADEC approval, pursuant to 18 AAC 75325(i) LF1: No unauthorized excavation or drilling in areas containing petroleum-contaminated groundwater LF1: If petroleum-contaminated groundwater is used or removed from the site, the groundwater will be characterized and managed by following regulations applicable at the time. LF1: Obtaining ADEC approval before removing or disposing of petroleum-contaminated groundwater at the site 	<ul style="list-style-type: none"> (None specified) 	<ul style="list-style-type: none"> Visual monitoring to occur at LF1 and LF2 until ADEC approves discontinuation of visual monitoring ICs and the requirements of 18 AAC 60 to remain as long as buried waste remains onsite LF1: Groundwater LTM will proceed until the groundwater contaminant plume is shown to be stable or shrinking and contaminant concentrations are decreasing 	<ul style="list-style-type: none"> Visual monitoring of top cover at each landfill for signs of settlement, subsidence, erosion, or other such events once every 5 years Maintaining the integrity of the final top cover of each landfill to limit exposure to landfill contents and subsurface soils includes making repairs and preventing run-on or run-off from eroding or otherwise damaging the cover material Submittal of a Performance Report (Five-Year Review) on ICs to ADEC once every 5 years after implementation of the remedial action (ROD signed 2011) Groundwater monitoring and reporting to ADEC annually at LF1 for five years after implementation of remedial action for GRO, DRO, RRO, VOCs, and PAHs; after 5 years, may revise schedule with ADEC approval; report to include comparison of current/historic results 	<ul style="list-style-type: none"> LF1 and LF2 are subject to the requirements of 18 AAC 60, which address inherent risk associated with landfills (included as part of remedy). Inclusion and documentation of all ICs in USAF Real Property Records, Kalakaket RRS General Plan, and 611 CES IRP Records, including information about the following: <ul style="list-style-type: none"> Current land uses and allowed uses of IRP Site LF002 Geographic extent of the IC boundaries (shown in Figure 1-2 of ROD) Maintaining existing administrative controls such as reviews under the National Environmental Policy Act, performed during project scoping and approval processes
Kalakaket: OT001	<ul style="list-style-type: none"> Restrict access and limit exposure to and use of petroleum-contaminated soil 	<ul style="list-style-type: none"> No excavation or disturbance of petroleum-contaminated soil in environmentally sensitive areas No movement of petroleum-contaminated soil without prior ADEC approval (pursuant to 18 AAC 75.325(j)) No unauthorized excavation or drilling in areas containing petroleum-contaminated groundwater If petroleum-contaminated groundwater is used or removed from the site, characterizing and managing the groundwater by following regulations applicable at the time. No unauthorized removal or disposal of petroleum-contaminated groundwater from the site without ADEC approval (18 AAC 75.325(i)) 	<ul style="list-style-type: none"> (None specified) 	<ul style="list-style-type: none"> When cleanup levels are achieved in soil as shown in Table 1-1 of the Decision Document, ICs may be terminated with ADEC agreement. Groundwater LTM will proceed until the groundwater contaminant plume is shown to be stable or shrinking and contaminant concentrations are decreasing. 	<ul style="list-style-type: none"> An inspection of the site and submittal of a Performance Report on ICs to ADEC once every 5 years after implementation of the remedial action. Submittal of a sampling plan and sampling report to ADEC for approval prior to removal of ICs Sampling of groundwater monitoring wells at PT1 annually for volatile organic compounds, polynuclear aromatic hydrocarbons, DRO, and RRO after implementation of the remedial action; monitoring frequency may be revised after 5 years by agreement with ADEC Submittal of a sampling report annually to ADEC with results of the current groundwater sampling event compared to historical results Submittal of a Performance Report on ICs to ADEC once every 5 years after implementation of the remedial action (DD signed 2011???) 	<ul style="list-style-type: none"> Inclusion and documentation of all ICs in USAF Real Property Records, Kalakaket RRS General Plan, and 611 CES IRP Records, including information about the following: <ul style="list-style-type: none"> Current land uses and allowed uses of IRP Site OT001 Geographic extent of the IC boundaries (shown in Figure 1-3 of ROD) Maintaining existing administrative controls such as reviews under the National Environmental Policy Act (NEPA) performed during project scoping and approval processes Maintaining existing administrative controls such as reviews under the National Environmental Policy Act (NEPA)
King Salmon: LF005 LF014	<ul style="list-style-type: none"> Address the possible chemical exposures and associated risk to human health and the environment by minimizing the potential for exposures to site contaminants and offsite contaminant migrations 	<ul style="list-style-type: none"> No unauthorized public access 	<ul style="list-style-type: none"> 6-foot high chain-link fence along the perimeter of the bluffs to protect the integrity of the caps Signs warning the public of the contents of the fenced areas 	<ul style="list-style-type: none"> (None specified) 	<ul style="list-style-type: none"> Surface water, groundwater, and sediment monitoring Determine if landfill gas is present Cap inspections and evaluation for erosion or subsidence Implement a management program for the wetlands areas of the site, including surface water and sediment monitoring, and possibly construction of berms, dikes or ditches to manipulate the flow of water and enhance the treatment of affected surface water and sediments Five-Year Reviews 	<ul style="list-style-type: none"> (None specified)
King Salmon: OT027 (covers gw restrictions for DP023, SS011, SS015)	<ul style="list-style-type: none"> Address the risk to human health and the environment caused by hypothetical exposure to petroleum product floating on groundwater and TCE-contaminated groundwater, surface water, and sediment 	<ul style="list-style-type: none"> Drinking water is to be obtained from C- aquifer only. No drinking water wells are to be installed in the A- and B- aquifers. 	<ul style="list-style-type: none"> (None specified) 	<ul style="list-style-type: none"> Groundwater, surface water, and sediment to be conducted annually for TCE for 25 years 	<ul style="list-style-type: none"> Groundwater, surface water, and sediment will be conducted annually for TCE. Groundwater contamination will be modeled every 5 years to assess TCE fate and transport. Five-Year Reviews 	<ul style="list-style-type: none"> Because this remedy will result in hazardous substances remaining onsite above risk-based levels, it will be reviewed by USAF and ADEC at a frequency of not less than once every 5 years after implementation of the selected remedy to evaluate if the remedy continues to be effective and appropriate. Input from the Naknek/South Naknek Native Village Council, King Salmon Village Council, federal and state trustees, and the King Salmon Restoration Advisory Board (RAB) will be solicited prior to implementing any significant changes.
King Salmon: OT028	<ul style="list-style-type: none"> Address the risk to human health and the environment caused by hypothetical exposure to petroleum hydrocarbon constituents and the chlorinated solvent, TCE in site soil, groundwater, and surface water (sites include OT28, SS20, SS21, and SS22) 	<ul style="list-style-type: none"> No installation of drinking water wells in the A- Aquifer 	<ul style="list-style-type: none"> (None specified) 	<ul style="list-style-type: none"> (None specified) 	<ul style="list-style-type: none"> MNA to confirm predicted RAOs are met, including contaminant levels should show a decreasing trend with a predicted end point of reaching cleanup levels within 25 years and contaminants (specifically TCE) detected at the points of compliance may not exceed action levels shown in ROD Table on page iv points of compliance refer to one or more of the groundwater monitoring wells or well points adjacent to Eskimo Creek Annual groundwater and surface water monitoring with a Five-Year Review consistent with a comprehensive monitoring plan to be developed by the agencies Groundwater modeling every 5 years (monitoring parameters on page iii of ROD). After the site MNA conditions have been established and evaluated during the Five-Year Review, sampling for MNA parameters may be performed on a less-frequent basis. Five-Year Reviews 	<ul style="list-style-type: none"> Institutional controls (documented in the Base Master Plan and state land records) to restrict installation of drinking water wells or other intrusive activities that would not be appropriate during remediation

APPENDIX B

Community Involvement Materials

AFFP

Public Notice Kalakaket Creek

Affidavit of Publication

UNITED STATES OF AMERICA
STATE OF ALASKA
FOURTH DISTRICT } SS.

Before me, the undersigned, a notary public, this day personally appeared Corrinna Whiteley, who, being first duly sworn, according to law, says that he/she is an Advertising Clerk of the Fairbanks Daily News-Miner, a newspaper (i) published in newspaper format, (ii) distributed daily more than 50 weeks per year, (iii) with a total circulation of more than 500 and more than 10% of the population of the Fourth Judicial District, (iv) holding a second class mailing permit from the United States Postal Service, (v) not published primarily to distribute advertising, and (vi) not intended for a particular professional or occupational group. The advertisement which is attached is a true copy of the advertisement published in said paper on the following day(s):


August 31, 2014

and that the rate charged thereon is not excess of the rate charged private individuals, with the usual discounts.



Advertising Clerk

Subscribed to and sworn to me this 31st day of August 2014.



Marena Burnell, Notary Public in and for the State Alaska.

My commission expires: December 07, 2017

00002828 00021680
NICOLE NEUMAN
MWH
1835 S. BRAGAW ST., STE. 350
ANCHORAGE, AK 99508

21680

Public Notice
Joint Base
Elmendorf-Richardson
Environmental
Restoration Program
Five-Year Review

Public Notice – The Joint Base Elmendorf-Richardson (JBER) Environmental Restoration Program Office announces the beginning of the Five-Year Review process for Kalakaket Creek Radio Relay Station (RRS), near Galena, Alaska. This process will document whether the remedies implemented for the response action at sites OT001 (entire former White Alice Facility, exclusive of LF002) and LF002 (Landfills LF1 and LF2) remain protective of human health and the environment. The Record of Decision was finalized in February 2010, and this will be the first Five-Year Review for these sites.

The Department of Defense (DOD) recognizes the importance of public participation in the JBER Environmental Restoration Program and encourages your involvement. If you have any issues or concerns about Kalakaket Creek RRS's cleanup program, or if you have direct knowledge regarding the cleanup remedies, the Air Force would like to talk to you. Verbal and written comments to be included in the Five-Year Review may be provided to Mr. Charley Peyton, AFCEC Remedial Project Manager, by mail at 10471 20th Street, Suite 348, JBER, AK 99506-2201, or by e-mail at charley.peyton@us.af.mil. The Air Force requests that comments for the Five-Year Review be provided to the Air Force by October 15, 2014. Another public notice will be issued informing the community that the review is complete.

Publish: August 31, 2014.

NOTARY PUBLIC
M. BURNELL
STATE OF ALASKA
My commission Expires December 7, 20____

APPENDIX C

*Five-Year Review Site Inspection
Documentation*

VISUAL INSPECTION CHECKLIST

Name of Landfill/Site: Kalakaket Creek RAS (LF002-LF1)
 Name of Inspector: C. Pisacchi, J. Burrell, J. Korol Date: 7/12/13
 Weather Conditions: Partly cloudy Precipitation: Yes No
 Temperature: 70 °F Prevailing Wind Direction: S Speed: 5-10 mph
 Photographs Taken: Yes

Installation: Kalakaket RRS	Inspection Site Name: LF002-LF1		
Monitoring Item	Y	N	Comments
Evidence of settlement within or on surface of landfill?		X	
Ponded water within, against, or on surface of landfill?		X	
Evidence of surface erosion on disposal area walls or on exterior berms?		X	
Erosion of access roads?		X	
Discoloring of vegetation downslope?		X	
Any evidence of leakage or escape of waste from cells?		X	
Airborne ash or dust particles?		X	
Evidence of wildlife or birds present? Include number and type of birds on site.		X	
Windblown litter in cells or along access roads?		X	
Landfill odors?		X	
Fire or combustion in the waste?		X	
Evidence of trespass or inconsistent site usage?		X	
Damage to the structural integrity of a dike wall, culvert, or erosion control?		X	
Is revegetation occurring?	X		
Estimated Percent Vegetative Cover: On cap surface: <u>>80%</u> On sideslopes: <u>>80%</u>			
Comments:			

General Comments: Vegetative growth (tall grasses and shrubs) obscures visual navigation to wells

Corrective Action Taken: Survey flagging tape tied to mark well locations

VISUAL INSPECTION CHECKLIST

Name of Landfill/Site: Kalakaket Creek RRS (LF002-LF2)
 Name of Inspector: C. Pisarri + J. Burrell Date: 7/15/14
 Weather Conditions: Cloudy Precipitation: Yes No
 Temperature: 65°F Prevailing Wind Direction: NE Speed: 10 mph
 Photographs Taken: Yes

Installation: Kalakaket RRS	Inspection Site Name: LF002-LF2		
Monitoring Item	Y	N	Comments
Evidence of settlement within or on surface of landfill?		X	
Ponded water within, against, or on surface of landfill?		X	
Evidence of surface erosion on disposal area walls or on exterior berms?		X	
Erosion of access roads?		X	
Discoloring of vegetation downslope?		X	
Any evidence of leakage or escape of waste from cells?		X	
Airborne ash or dust particles?		X	
Evidence of wildlife or birds present? Include number and type of birds on site.		X	
Windblown litter in cells or along access roads?		X	
Landfill odors?		X	
Fire or combustion in the waste?		X	
Evidence of trespass or inconsistent site usage?		X	
Damage to the structural integrity of a dike wall, culvert, or erosion control?		X	
Is revegetation occurring?	X		
Estimated Percent Vegetative Cover: On cap surface: <u>>80%</u> On sideslopes: <u>>80%</u>			
Comments:			

General Comments: _____

Corrective Action Taken: None required

APPENDIX D

2014 Site Inspection Photographs



JULY 2014 – KALAKAKET CREEK RRS PHOTOGRAPHIC LOG



Photo 1: Western end of airstrip; view northeast.



Photo 2: Oil-stained soil at western end of airstrip; view south.



Photo 3: Site OT001; aerial view southeast.



Photo 4: Site OT001, Subarea PT1, well PT1SB01; view south from airstrip.



Photo 5: Site OT001, Subarea PT1, well PT1SB01; view of replaced well cap.



Photo 6: Site OT001, Subarea PT1, well PT1SB04; view of pre-repair condition.



Photo 7: Site OT001, Subarea PT1, well PT1SB04; view of 2014 repaired condition.



Photo 8: Site OT001, Subarea PT1, well PT1SB05; view of replaced well cap.



Photo 9: Site OT001, Subarea PT1, well PT1SB15; view of pre-repair condition.



Photo 10: Site OT001, Subarea PT1, well PT1SB15; view of 2014 repaired condition.



Photo 11: Site LF002, subarea LF1; view of vegetated access road/trail.



Photo 12: Site LF002, subarea LF1; view toward north edge.



Photo 13: Site LF002, subarea LF1; view toward northeast edge.



Photo 14: Site LF002, subarea LF1 well LF1SB07MW.



Photo 15: Site LF002, subarea LF2; aerial view southeast.



Photo 16: Site LF002, subarea LF2; aerial view west.



Photo 17: Northern edge of Site LF002, subarea LF2; view south.

APPENDIX E

Interview Records

**Interview Questions for the Project Manager
Kalakaket Creek RRS**

1. Is a report regarding the Long Term Monitoring (LTM) and Maintenance activities performed at Sites OT001 and LF002 during the 2014 field season available? Can we obtain a copy of the report?
2. The Site OT001 and LF002 remedies include institutional controls (ICs) for petroleum-contaminated soil and/or groundwater. Can you provide documentation showing that these ICs are in place or describe how they were recorded? Also can you provide information regarding the date that these ICs were established?
3. Could you provide estimated annual costs for the LTM and maintenance program?
4. Are the remedies at Sites OT001 and LF002 functioning as expected?
5. Do you know of any problems or difficulties that have been encountered which have impacted remedy implementation or progress at these sites?
6. Have any problems been encountered which required, or will require, changes to the RODs or Decision Documents for OT001 or LF002?
7. Are you aware of any community concerns regarding these sites? If so, please give details.
8. Are you aware of any events, incidents, or activities at these sites such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.
9. Do you have any general comments, suggestions, or recommendations regarding the management of these sites, remedy implementation, or ongoing work at the sites?

APPENDIX D
INTERVIEW RECORDS KALAKAKET CREEK PRRS

INTERVIEW DOCUMENTATION FORM

The following is a list of individual interviewed for this five-year review. See the attached contact record(s) for a detailed summary of the interviews.

<u>CHARLEY PEYTON</u>	<u>PM</u>	<u>GUTH CES/CEAN</u>	<u>1-9-15</u>
Name	Title/Position	Organization	Date
<u>DENNIS SHEPPARD</u>	<u>PM</u>	<u>ADEC</u>	<u>2-17-15</u>
Name	Title/Position	Organization	Date
_____	_____	_____	_____
Name	Title/Position	Organization	Date
_____	_____	_____	_____
Name	Title/Position	Organization	Date
_____	_____	_____	_____
Name	Title/Position	Organization	Date
_____	_____	_____	_____
Name	Title/Position	Organization	Date
_____	_____	_____	_____

INTERVIEW RECORD

Site Name: <u>KALAKAKET CREEK RDS</u>	EPA ID No.:	
Subject: <u>FYR</u>	Time: <u>1410</u>	Date: <u>1/9/15</u>
Type: <input checked="" type="checkbox"/> Telephone <input type="checkbox"/> Visit <input type="checkbox"/> Other	<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing	
Location of Visit:		

Contact Made By:

Name: <u>CAL LAMSON</u>	Title: <u>HEALTH & SAFETY CAPTAIN</u>	Organization: <u>MWH</u>
-------------------------	---	--------------------------

Individual Contacted:

<u>G11TH CES/CSARJ</u>		
Name: <u>CHARLEY PEYTON</u>	Title: <u>P.M.</u>	Organization: <u>AFCEC</u>
Telephone No: <u>907.552.9705</u>	Street Address: <u>10471 20TH ST. STE 348</u>	
Fax No:	City, State, Zip: <u>JBEN, AK 99506-2201</u>	
E-Mail Address: <u>CHARLEY.PEYTON@US.AF.MIL</u>		

Summary Of Conversation

1. YES, CURRENTLY IN REVIEW
2. YES, THEY SHOULD BE IN THE DECISION DOCUMENT
3. YES, I CAN GET IT, BUT IT WOULD BE BETTER IF SOMEONE COULD COME OVER AND WE COULD GO OVER IT IN PERSON.
4. WE HAVE SOME WELLS THAT RECHARGE SLOWLY MAKING GROUNDWATER SAMPLING DIFFICULT.
5. NO
6. NO - I HAVE TALKED WITH DENNIS SHEPPARD (ADEC) AND HAVE ADVISED THAT SAMPLING SHOULD BE REDUCED TO EVERY 5 YRS. I ANTICIPATE THIS WILL HAPPEN
7. NO, ITS REMOTE WITH NO COMMUNITIES NEARBY.
8. NO
9. WE HAVE GOOD DATA FOR THE PAST FIVE YEARS AND THE SITE SHOULD BE MONITORED EVERY FIVE YEARS

INTERVIEW RECORD

Site Name: <u>KALAKAKET CREEK R23</u>	EPA ID No.:	
Subject: <u>LTM SITES OYOP1, LFOP 2</u>	Time: <u>4:00P</u>	Date: <u>2/17</u>
Type: <input checked="" type="checkbox"/> Telephone <input type="checkbox"/> Visit <input type="checkbox"/> Other	<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing	
Location of Visit:		

Contact Made By:

Name: <u>CHARLES LANSOU</u>	Title: <u>HQ'S COORDINATOR</u>	Organization: <u>MMH</u>
-----------------------------	--------------------------------	--------------------------

Individual Contacted:

Name: <u>DENNIS SHEPPARD</u>	Title: <u>PM CONTAM. SITES</u>	Organization: <u>ADEC</u>
Telephone No: <u>907.451-2180</u>	Street Address: <u>610 UNIVERSITY AVE.</u>	
Fax No:	City, State, Zip: <u>FAIRBANKS, AK</u>	
E-Mail Address:	<u>99709-3643</u>	

Summary Of Conversation

4. YES, THEY ARE FUNCTIONING AS EXPECTED

5. THE MONITORING WELLS ON SITE HAVE PROBLEMS WITH LOW RECOVERY. A FEW OF THE WELLS WE HAVE NOT COLLECTED SAMPLES. ALL THE SAMPLE RESULTS SO FAR HAVE BEEN SIMILAR. THE O&M CONTRACTOR HAS BEEN WORKING ON THE WELLS, THEY HAVE NOT BEEN SAMPLED YET.

6. NO CHANGE, BUT SOLID WASTE PLAN HAS Lapsed ISSUED BY ADEC. WE ARE CURRENTLY WORKING ON THIS RENEWAL - LETTER SENT TO CHARLEY PEYTON WHO SENT IT TO ADEC. WE DO NOT EXPECT ANY PROBLEMS WITH THE RENEWAL.

7. NO

8. CONTRACTOR REPORTED A-WHOLEN TRACKS ON THE LAND FILL AND A FEW SMALL OIL STAINS. THERE WAS SOME METAL DEBRIS POKING UP THROUGH THE LINER THAT

2009

THE CONTRACTOR CUT OFF.

9. NO

NOTE: QUESTIONS 1 FROM 3 PERTAIN TO THE SITE PROJECT AND WERE NOT INCLUDED IN THE AGENCY/COMMUNITY MEMBERS QUESTIONNAIRES.